Refugees' ICT use across their journey and when relocating: a literature review

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Abstract

This literature review aimed to analyze existing research on refugees' ICT use during their journey and when relocating. In total, 40 articles were found to be relevant for this study, of which 20 articles were relevant for refugees' ICT use during the journey and 20 articles for their ICT use when relocating. To analyze the selected articles and gain better understanding of refugees' ICT usage, three theoretical frameworks were applied: affordance theory, the uses and gratifications theory (UGT), and dimensions of integration. The analyzed studies mostly used a qualitative method, specifically interviews, to analyze refugees' ICT use. Applying affordance theory to the selected literature, the most important affordances of technology that were identified were affordances regarding information obtainment, communication and networks, and locations. ICTs allow for greater safety during refugees' journey, but can also increase risks while migrating. In addition, ICTs allow refugees to form and maintain relationships, during the journey as well as when relocating. Applying the UGT to the studies showed that refugees fulfilled needs by using ICTs regarding information obtainment, documentation, personal identity, knowledge about other people, and social interaction. Previous research barely touched upon entertainment, coolness, escape from daily lives and creativity as gratifications. Lastly, during refugees' relocation in a new society, existing research mostly covered the dimensions of social and cultural integration, disregarding political and economic integration as topics. Future research could focus more on quantitative methods, a broader range of technological affordances that might be relevant for refugees, a broader range of possible needs that refugees use ICTs for, and on refugees' political and economic integration considering their ICT usage.

Keywords: refugees, ICT, journey, relocation, affordance theory, uses and gratifications theory, dimensions of integration

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The displacement of people from their homes and countries due to conflicts and other crises is a global issue that affects millions of people around the world. Since 2015, there has been an official refugee crisis in Europe. Broadly described, a refugee is "a person who has been forced to leave their country in order to escape war, persecution, or natural disaster" (Oxford Languages, 2022). By the end of 2022, the UN Refugee Agency was aiding 12.4 million refugees in Europe (UNHCR, 2022). During the risky and sometimes life-threatening journey that refugees take, the use of ICTs is of great importance. ICT, meaning information and communication technology, is defined as "a diverse set of technological tools and resources used to transmit, store, create, share or exchange information" (UNESCO, 2009, p. 119). The usage of ICTs, especially smartphones, enable refugees to for instance find information and contact resources during their journey (Alencar et al., 2019; Gillespie et al., 2018).

In the past decade, starting at the official refugee crisis from 2015 and beyond, research has highly expanded on the topic of mobile technologies that impact refugees' lives and mobile technologies that are used by refugees. A great deal of evidence is emerging for the fact that smartphones are a vital tool in overcoming all stages of the refugees' journey (Gillespie et al., 2016; Gough & Gough, 2019). It has even been argued by previous research that the journey of a refugee has become a media migration, as much as a physical migration (Gillespie et al., 2018). ICTs can also help refugees with facing the daily challenges when relocating in the country where they have arrived (Alencar, 2018). According to Warnes (2018), mobile connectivity is for many refugees a basic need such as water and food, and connectivity is seen by refugees as a survival tool which is of greater importance than for example education or healthcare.

A great deal of new research has been conducted about refugees and digital technology, creating a new area of research named Digital Migration Studies (Leurs & Prabhakar, 2018; Leurs & Smets, 2018). However, due to the great deal of emerging research on this topic, there is not much order to it. There has been an extensive amount of new research and new findings, but there are very few helpful overviews to demonstrate how all this research coheres. It is therefore interesting to review this topic and identify possible links between findings or new shortcomings, which can propose ideas for future studies. The use of technology by minorities such as refugees has been studied, but in isolation, so within particular refugee communities rather than across them (Leurs & Smets, 2018). This literature review intends to give order to the studies regarding this emerging topic, give a helpful overview of the extensive amount of new research, and compare multiple studied communities within refugees to fill existing gaps. This will be done by applying three main theories: the uses and gratifications theory, affordance theory, and the dimensions of integration. These three helpful theories will aid in giving order to existing literature, as well as in identifying and filling gaps.

A small amount of literature reviews has been done on the use of technological devices by refugees, especially regarding mobile communication through mobile phones (Alencar, 2020; Mancini et al., 2019). Mancini et al. (2019) conducted a scoping review on the role of mobile phones for refugees and found that mobile phones present opportunities as well as risks to refugees regarding their human rights. However, they also concluded that research on this topic is still inconsistent and fragmented. In addition, Alencar (2020) focused on the role of mobile phones and mobile communication for refugees regarding their journey, protracted displacement and resettlement. This literature review takes a broader look by including all forms of ICT usage, instead of having a focus on solely mobile communication and mobile phones as the studies by Alencar (2020) and Mancini et al. (2019) did. In addition,

this study also takes into consideration how refugees use ICTs themselves in order to obtain a greater understanding of their technology usage to fulfill certain needs and reach certain goals, instead of focusing only on the role that mobile phones have for refugees as in the studies by Alencar (2020) and Mancini et al. (2019).

This literature review aims to identify what the current state of literature is on how refugees use ICTs during their journey and when relocating. Thus, two situational aspects of a refugee's life will be taken into consideration regarding their ICT use. Studying the ICT use of refugees during their journey and when relocating is of high importance, since understanding their technology use identifies their challenges, how they use online resources and which networks they form. In addition, gaps in services derived from refugees' ICT use can be identified in order to support technological resources for refugees so that they will suit refugees' needs and ensure greater safety. This can also aid researchers and instances who work with refugees in understanding how refugees guide their journey, pursue relocation, and in how refugees can be helped, in this case with a focus on refugees' use of ICTs. For the purpose of this study, relocation means when refugees have settled in the latest country of arrival, where they plan to integrate and settle.

This study will give a systematical overview of studies that emphasize the ICT use of refugees during their journey and studies that emphasize the ICT use of refugees when relocating by collecting, reporting, and analyzing existing data from research, and therefore providing an overview of existing research (Kennedy, 2007). Although the study consists of two aspects, comparison of the situations (the journey vs. the relocation) is not the focus of this study. The two situations will be analyzed and described separately, after which possible comparisons may be made between studies regarding refugees' ICT use during the journey and studies regarding refugees' ICT use during their relocation. This literature review aims to

answer the following research question, by applying the uses and gratifications theory, affordance theory, and the dimensions of integration:

RQ: What is the state of research on how refugees use ICTs to support the navigation of their journey and to pursue integration when relocating?

In the following section, refugees' use of ICTs during their journey and when relocating is highlighted through an examination of earlier research, after which three theoretical frameworks are provided in order to analyze the existing literature. Affordance theory, the uses and gratifications theory and dimensions of integration are three promising frameworks that aid in generalizing existing findings, identifying gaps, understanding refugees' ICT use on a deeper level, and providing suggestions for future research. After providing the Theoretical Framework, the Method section explains how this literature review was conducted. In addition, the Results section will objectively report on the methods, participants, location of the study, theories or concepts that have been used, the technologies that were focused on, and findings from the analyzed studies. Subsequently, the Discussion will interpret the meaning of the results obtained from analyzed studies, by applying the uses and gratifications theory, affordance theory, and dimensions of integration on a deeper level. In addition, gaps will be identified and recommendations for future studies will be made. Lastly, in the Conclusion, a summary of the results will be provided, after which practical implications about refugees' ICT use will be described.

Theoretical Framework

ICTs and refugees

The intensity of the current refugee crisis in Europe that started in 2015 has laid a foundation for new developments regarding ICT tools and platforms such as for mobile phones, apps, and the internet (Schreieck et al., 2017). According to Bock et al. (2020), humanitarian professionals believe that the usage of these platforms can lead to insiders (refugees) helping each other but also to outsiders helping the insiders and therefore creating more so-called "global solidarity". The use of mobile phones by refugees across Europe has increased greatly and they reach to ICTs for multiple reasons. Firstly, ICTs are used to share highly important information and stay connected with relatives. In addition, many refugees rely on a Global Positioning System (GPS) function on their smartphone, in order to guide themselves and arrive at the right destinations. Also, special apps designed for refugee journeys can give information about shelter, languages, food aid, recommendations about packing and how to file for asylum. Lastly, ICTs are used by refugees to learn about the culture, language, and norms of the country of arrival (AbuJarour et al., 2017; Bock et al., 2020).

Refugees themselves also describe ICTs as something they could not live without. Refugees and migrants have expressed that smartphones and mobile connectivity are seen as a basic need in their lives (Warnes, 2018). Many refugees consider mobile phones as the only source of information access that is available for them (AbuJarour et al., 2017). Although most studies focus on the positive aspects of ICTs for refugees, the usage of ICTs can also harm refugees (Gillespie et al., 2018). Gillespie et al. (2018) found that social media networks displayed many false rumors, false information, and conspiracy theories towards refugees, which made their journey perilous. In addition, the ICT device itself can also cause risks for refugees. Refugees might have to sell their mobile phone when crossing a border, and later

buy a new phone when they have crossed a border, since being caught by authorities while carrying a phone can be risky (Gillespie et al., 2016). However, refugees have established strategies to diminish this risk and protect their forms of ICTs, in order to still access information about for instance routes (Gillespie et al., 2016).

ICTs during refugees' journey

ICTs are of great importance during the journey of refugees, and for refugees a smartphone is seen as a basic need and a tool in order to survive (Gillespie et al., 2016; Gillespie et al., 2018; Gough & Gough, 2019). Gough and Gough (2019) interviewed Syrian refugees and found that smartphones are vital tools in overcoming every stage of a refugee's existential and physical journey, starting in Syria and settling into Denmark. In addition, they argued that mobile phones form an important network for refugees so they can for example communicate with their friends and family during their journey. However, this network can also enable smugglers and traffickers to interfere and causes a higher risk of fraud and scams to refugees. In their study, Gillespie et al. (2016) interviewed refugees and they all acknowledged that smartphones guaranteed their physical mobility. Also, refugees mentioned to use ICTs mostly during their journey to stay in touch with loved ones, to take photos and recordings in order to create and remain memories, and to access information through the internet. Most importantly, refugees use mobile phones and smartphones for specific refugee purposes, to plan their journey and keep in touch with smugglers or others who can offer help (Gillespie et al., 2016).

Refugees mostly use and depend on mobile phones or smartphones during their journey to especially access the internet (Dekker et al., 2018; Zijlstra & Van Liempt, 2017). Gillespie et al. (2018) argue that smartphones are lifelines to refugees, as well as a basic necessity similar to water. Refugees depend on smartphones for many reasons, such as being locatable during their journey at sea, to inform others, and obtain information regarding legal-

political rules within different countries. However, the same functionalities of smartphones that allowed refugees to communicate with loved ones and that guided them towards their destination, are also used as a target to for example surveillance and thus form a threat towards refugees (Gillespie et al., 2016). Although mobile phones or smartphones are the form of ICT that is most focused on in existing research, other studies have also focused on for instance social media, ICTs, and technologies in general such as the internet (Chamakiotis et al., 2022; Dekker & Engbersen. 2014; Merisalo & Jauhiainen, 2020; Newell et al., 2016).

Refugees also have a number of needs they want to fulfill by using technology. Refugees meet several stressors during their journey, but the greatest stressor for refugees is family deprivation, which can later result in psychological trauma because they might feel guilty for leaving or lack contact with loved ones at home (Rousseau et al., 2001). In their study, Alencar et al. (2019) interviewed male refugees in order to identify how refugees used smartphones to fulfill certain needs during their journey. Firstly, refugees use smartphones to contact loved ones and refugee communities. Through these communities, refugees could be in contact with other refugees or with smugglers and set up migration networks to enhance their mobility. In addition, refugees use their mobile phone for a sense of security. They make use of GPS apps, apps for information about for instance the weather, and text messaging groups to gain confidence about the challenge of their journey and to relieve some anxiety (Alencar et al., 2019; Zijlstra & Van Liempt, 2017). Lastly, Alencar et al. (2019) found that refugees use smartphones to preserve memories about their journey, and take for example pictures to remember important moments.

In conclusion, refugees mostly make use of mobile phones and smartphones during their journey for multiple reasons (Dekker et al., 2018; Gillespie et al., 2018; Zijlstra & Van Liempt, 2017). Most importantly, they use their phone to navigate their journey as safely as possible, stay in contact with loved ones, and to preserve memories (Alencar et al., 2019;

Gillespie et al., 2016; Gillespie et al., 2018; Gough & Gough, 2019). Although the amount of studies about refugees in relation to digital technologies and migration is rapidly increasing, refugees still remain an under-represented population when it comes to the topic of digital technologies and migration. Previous research has found that most studies tend to focus on "elite" migrants who are highly mobile when examining technology and migration, rather than on transnational refugees (Leurs & Smets, 2018). Refugees thus have received comparatively little attention in studies about technology use and migration compared to other technology users, even though technology is highly important in refugees' lives (Leung, 2018; Leurs & Smets, 2018). However, since the amount of studies about refugees and technology is increasing, there is enough research done to evaluate previous findings and conduct a literature review. The division between refugees and "elite" migrants is not equally distributed yet, however, some studies that investigated migrants' or asylum seekers' ICT use are very likely to have examined a mix of forced and non-forced migrants due to the large group of participants (Coddington & Mountz, 2014; Collyer, 2010; Dekker & Engbersen, 2014). In addition, most studies focus on refugees and their passage to Europe, in which oftentimes the official refugee crisis in Europe in 2015 is a central topic (Leurs & Smets, 2018). Other continents or countries outside of Europe remain under-represented in studies about refugees' use of technology.

ICTs during refugees' relocation

The accessibility of ICTs for refugees raises more opportunities to engage in especially the social aspects of the country in which they will be relocating, in order to enhance their integration. By using ICTs, refugees can form new connections with the local community to enhance their social integration (Alam & Imran, 2015). In addition, ICTs can provide migrants and refugees with materials and information about their rights, information about the new environment, obtaining citizenship, communicating with others, and providing

migrant support services, and can aid in overcoming sentiments of loneliness and isolation (Andrade & Doolin, 2019; Dekker & Engbersen, 2014; McGregor & Siegel, 2013). At the same time, refugees are able to stay connected to their loved ones in their home country which strengthens their own cultural identity (Andrade & Doolin, 2019).

Refugees can utilize mobile phones and/or smartphones to handle everyday challenges in case internet access is available and stable. Refugees use all kinds of smartphone apps to integrate in the country of arrival, such as location-based apps. The use of GPS is of great importance during refugees' journey, and refugees also make use of GPS apps to familiarize themselves in a new, unfamiliar country (Kaufmann, 2018). In addition, smartphones are greatly used for learning as they support learning that is highly personal and dependent on an individual's situation (Kukulska-Hulme et al., 2015). Refugees interviewed in the study of Kaufmann (2018) also reported learning through their smartphone, by for instance using online dictionaries and apps and videos for (language) teaching. Additionally, smartphones offer a great deal of means to maintain contact with loved ones transnationally. Various aspects of smartphones such as the ability to send photos, emoticons, and voice recordings created feelings of closeness towards loved ones despite the distance (Madianou & Miller, 2012; Madianou, 2017).

Alencar (2018) interviewed refugees in order to find out how social media applications are used amongst refugees and how this is related to their integration in the Netherlands. Generally, refugees prefer social media platforms more than other sorts of internet applications. All interviewed refugees were also able to access the internet on their phone, providing them with the ability to use social networks whenever they are able to. Social media platforms were mostly used by refugees to build social capital, to learn the language, and to learn more about the new culture. Most refugees disclosed being associated with Facebook communities for enhancing contact with other refugees and Dutch natives, but they also

disclosed being associated with other social media platforms to acquire the language and cultural aspects of the Netherlands (Alencar, 2018). Alencar (2018) also highlighted the importance of social media for refugees related to staying in contact with friends and family who are still in the home country, in order to receive emotional and social encouragement. Other forms of technology that previous research has touched upon besides mobile phones and social media are ICTs and technology in general such as the internet, and ICT platforms specially designed for refugees (AbuJarour et al., 2017; Bock et al., 2020; Witteborn, 2015).

In conclusion, refugees mostly use ICTs during their relocation process to stay connected to their loved ones, to learn about the language and the culture of the country of arrival, to build social capital and to find relevant information (Alencar, 2018; Andrade & Doolin, 2019; Kaufmann, 2018). In studies about refugees' media use while relocating, again the main geographical region that is being examined is Europe (Alencar, 2018). Refugees also remain an under-represented population in the topic of technology use during relocation and integration, since the focus of most studies is about migrants who were not necessarily forced to migrate (Leung, 2018; Leurs & Smets, 2018). However, similar to the topic of refugees' ICT use during their journey, enough research is done to analyze previous findings and conduct a literature review. Research about refugees and digital technology has some gaps and deficiencies, even though it is an emerging topic.

Currently, the existing state of research on refugees' ICT use is a rapidly growing collection of new research, without much order to it. By conducting a literature review on the topics of refugees' ICT use during their journey and during their relocation instead of collecting new data, this literature review will bring order to the existing literature. Since the topic of refugees and ICTs is constantly emerging and a great deal of new research has emerged in the recent years, it is of great value to synthesize existing knowledge as a tool for future data collection. Collecting findings of existing research is of great value to understand

refugees' ICT use, which can guide researchers as well as organizations in understanding and aiding refugees regarding their technological abilities and knowledge. In addition, there is no existing literature review on how refugees use ICTs themselves, while studies about this topic are rapidly growing. Therefore, this literature review will provide a unique overview of existing studies to synthesize existing knowledge, to provide new directions for future studies based on gaps in existing literature, and to provide practical implications on the topic of refugees' ICT use. Lastly, by using three theoretical frameworks to analyze existing research on this topic, a new perspective on existing research will be provided by drawing existing themes and identifying missing themes from findings of previous research. Therefore, the three theories and their concepts will aid in synthesizing current literature and identifying gaps which will also provide new directions for future research.

Theoretical approaches to refugees' ICT use

Many studies have already been done on refugees and their ICT use, and this study will look at all the existing work through the perspective of the three theories presented below. It could help to connect the great deal of incoming studies about refugees and technology to some major theories. The uses and gratifications theory, dimensions of integration and affordance theory were used by identifying key concepts of each theory, and applying those to the results of the analyzed studies. The goal of this literature review is to understand how to synthesize the existing research, since there are a great deal of studies in different areas regarding this topic. By applying the key concepts of the three theories, generalizations can be made about the existing research, but it will also become apparent what is still missing in existing research or what has barely been touched on. It will also become evident how much research is already addressing these theories, which then are very likely used to comprehend and analyze results in existing research. Furthermore, if certain key concepts of the theories have not been touched upon by existing research, it can provide

implications for future research about refugees' ICT use topics that have not been examined yet.

This approach to a literature review was drawn from the study done by Alencar (2020). In her literature review, affordance theory was applied to give order to existing literature on the role of mobile phones for refugees. This literature review will go beyond the study by Alencar (2020), by examining how refugees use ICTs themselves instead of focusing on the role of mobile phones for refugees, as well as by applying three theoretical frameworks to existing literature. In addition, in this literature review, the three theories will be used to identify gaps in existing research, as well as to provide implications for future research, which was not explicitly done in the study by Alencar (2020).

Uses and gratifications theory

The first theory that can assist in understanding existing research on how refugees use ICTs during their journey and when relocating is the uses and gratifications theory. The uses and gratifications theory is based on the perception that people use media and technology to satisfy their needs (Wu et al., 2010). The uses and gratifications theory (UGT) was originally based on people's use of mass media, but now the focus when applying the theory in research is more on (social) media channels (Croes & Bartels, 2021). Previously, the UGT consisted of five gratifications that people use media for: information, social interaction, personal identity, entertainment, and an escape from the daily life. Regarding (social) media, a few gratifications could be added to this list: knowledge about other people, coolness, creativity, and documentation (Sheldon & Bryant, 2016). The UGT questions why people use media, what they do with media, and what they use it for. Users choose media that will satisfy their needs and use it for instance for relaxation, social interactions, escaping daily life, or to gain knowledge (Menon et al., 2021).

Specifically, mobile phones have many uses and gratifications since they can be used for a great deal of purposes. There is a great deal of emerging research on mobile phones since this type of technology has a high mobility and facilitates constant access. Mobile phones are used for multiple uses and gratifications (UG's), which can differ based on audience and location: entertainment, affection/sociability, immediate access, mobility, fashion/status, instrumentality, and psychological reassurance (Leung & Wei, 2000). In addition, the internet also provides a new field to be explored through the UGT. Stafford et al. (2004) found that the internet has three main categories of gratifications: content, process and social gratification. The content gratification relates to the need to find specific information and do research on the internet. Furthermore, the process gratification relates to the functional process of users randomly browsing the internet or navigating with a purpose. Lastly, the social gratification refers to the possibility of forming and increasing social ties through the internet (Stafford et al., 2004). In addition, social media use has also been discovered through the UGT. Users of social media have the following motivations to use it: entertainment, recognition, need to speak out negative feelings, social and affection, and cognitive needs (Leung, 2013).

The UGT could be useful when examining the refugee experience in relation to ICTs for a number of reasons. There are expected to be several gratifications that arise from the usage of ICT by refugees, based on existing research. Regarding the mobile phone use of refugees during their journey, it is expected that previous research shows that they will mostly use a phone for immediate access and mobility, while during their relocation the UG's are expected to be affection/sociability and immediate access. The internet is expected to be most used regarding content gratification during refugees' journeys. However, during the relocation of refugees in a new society, previous research is expected to show that the internet is most used for the social gratification. Social media can also be used by refugees, and it is expected

that they mostly use it during their relocation. Existing research, in which the UGT has not been applied to a great extent, nonetheless suggests that the gratifications refugees will expectedly use social media for are recognition, social and affection, and cognitive needs.

Alencar (2019) investigated the media use of refugees during their journey by applying the UGT to identify social, material and psychological needs. In the results, Alencar (2019) described that refugees who participated in her study obtained emotional gratifications by for instance calling their families to fulfill their need of contacting home and family. In addition, refugees also obtained socialization and community-building gratifications through smartphones. However, this was more often done by sharing Wi-Fi hotspots which eased the establishment of social connections between refugees. In conclusion, Alencar (2019) defined four clusters of media uses and gratifications: smartphone as a lifeline, an organizational hub, a companion, and diversion. In her study, the UGT was used to gain a better understanding of the results obtained from interviewing refugees, and the theory was not used with pre-defined clusters. The UGT was not utilized as a lens to analyze with, but was applied afterwards to define clusters in the study's findings (Alencar, 2019). This literature review will apply the UGT to existing literature, to investigate how previous research has touched upon certain parts of the UGT and to examine which parts might be still missing.

Analyzing previous research about refugees' ICT use applying the UGT can present a deeper understanding of how and why refugees use technology during their journey and relocation in a new society. The UGT can possibly identify the needs and motivations that drive refugees to use ICTs during their journey and relocation, for example to keep in touch with loved ones or look for information regarding their journey. The UGT can also explore refugees' patterns of ICT use. During the journey, refugees might use ICTs mostly to seek information and previous experiences of other refugees, while they might use technology mostly to socially interact during relocation in the new society. Lastly, the UGT might also

identify, by analyzing previous research, how effectively ICTs are for refugees' needs. For example, if existing research suggests that refugees use ICTs frequently to socially integrate, but not to economically or politically integrate, their needs regarding these dimensions of integration are not met and media platforms to fulfill these needs and aid refugees could be established. The UGT could in this example identify refugees' connections with host communities which is an important aspect of integration. Of course, the UGT is also important regarding refugees' ICT use during their journey.

Affordance theory

The second theory that can be helpful in critically examining existing literature regarding refugees' ICT use is affordance theory. Affordances were firstly observed by Gibson (1977) when he wrote about affordances being features of an object that enable it to function. In addition, he perceived an actor of having a goal, and identified an object as something with which that actor can possibly meet that goal (Gibson, 1977). Related to technologies, Hutchby (2001) described technology as being an object, with the affordances of technology being defined in functional as well as in relational ways. Affordances of technology are functional because they are either enabling or constraining, and the features determine how users can participate in certain activities. Certain objects have affordances which facilitate particular activities that other objects do not facilitate. On the other hand, affordances of technology are relational since the affordances of a particular object can be dissimilar for users, often depending on their circumstances or abilities (Hutchby, 2001).

Most research that has applied affordance theory has been done about information systems in general (Pozzi et al., 2014; Volkoff & Strong, 2017; Wang et al., 2018). Volkoff and Strong (2017) claim that affordance theory develops into something valuable when starting to utilize it as a lens to change how information system topics are perceived, rather than investigating the theory itself. This literature review will also use affordance theory as a

lens to analyze outcomes of existing research about refugees' ICT use. Affordance theory has been used mostly in three specific domains: organizational change (related to technology and networks), the use of social media, and software development (Volkoff & Strong, 2017). The use of technological affordances is also increasingly common in studies regarding refugees and their technology use (Gillespie et al., 2018; Kaufmann, 2018; Twigt, 2018). These studies look at the affordances of technology to analyze their results and gain a better understanding of refugees' technology practices in their specific studies, while this literature review will use affordance theory as a means to link previous research together and synthesize previous findings.

By applying affordance theory in this literature review, the interdependent relationship between users and technology can be clarified. Gillespie et al. (2018) examined the role of smartphones in the journeys of refugees in their study by examining affordances of smartphones. They focused on the digital practices of refugees within differing contexts during their journey, taking space and time in consideration, while also focusing on the fluidity of technology and its affordances. In addition, Twigt (2018) described affordances as being different values and utilities that technology has. They specifically examined affective affordances of technology, meaning that technology can for instance bring out feelings of hope or anxiety (Twigt, 2018). Kaufmann (2018) found in his study that not all Syrian refugees using a smartphone were aware of differences in smartphone affordances in Europe compared to Syria. This caused refugees to accommodate to their smartphone gradually, when more contexts were emerging during their integration in the new society (Kaufmann, 2018). In addition, Alencar (2020) looked through the lens of the socio-technical perspective to analyze refugees' mobile communication use in her literature review, with the affordance theory as part of this perspective.

Affordance theory as a concept and applied in other studies could aid this literature review to approach this topic, the ICT use of refugees, to pay attention to a broad range of elements and features of technology. Affordance theory can grant insights into how refugees use ICTs to meet their needs regarding for instance communication or information. Analyzing previous research about the ICT use of refugees using affordance theory as a lens can help to understand how refugees utilize ICTs during their journey and when relocating. It can also help identify risks and opportunities refugees face when using ICTs. By understanding the ways in which ICTs may constrain and/or afford refugees, future research may build upon these results and for instance develop new ways to support refugees in their ICT use.

Dimensions of integration

In addition to affordance theory and the UGT, dimensions of integration as a theoretical framework can be helpful to critically examine literature regarding the refugees' ICT use in the relocation process. One of the first studies that described integration of migrants was a study done by Berry (1997). He described acculturation in a new, larger society as possible happening in four ways: integration, assimilation, separation/segregation and marginalization. In his paper, he claims that integration is when migrants seek to engage in the new society network as an intrinsic part of it, while still having an interest in maintaining their original culture. So, integration is the combination of valuing one´s own identity and characteristics together with valuing to maintain connections with the larger society (Berry, 1997). For assimilation and marginalization, one's own identity is not being valued while for separation/segregation and marginalization the relationship with the new society is not being valued. Berry (1997) described that integration is the most successful accumulation strategy, and causes the most positive adaption. He developed a framework for acculturation, defining five types of group integration: physical, biological, economic, social and cultural. Physical integration for migrants involves for instance urbanization, so moving to a place with a high population

density. Next, biological integration means getting used to new dietary intake and the risk of new diseases. Economic integration refers to adjusting to a new economy with the risks of losing employment opportunities or status for migrants. Social integration relates to forming new connections in the society and possibly losing old communities or friendships. Lastly, cultural integration is broadly described and ranged from how migrants dress and how the new society dresses, to religions, and to other important values that may differ from the new society (Berry, 1997).

The integration of refugees in the country of arrival is a dynamic and multifaceted process (Alencar, 2018). Penninx (2005) defined integration for migrants in terms of four dimensions: social, economic, cultural and political integration. In his paper, the political dimension refers to whether immigrants are considered as members of the political community and whether they have secured residence rights. Penninx (2005) explains the social and economic dimension as one concept, and calls it the socio-economic integration. This refers to the economic and social rights that immigrants have, related to for example equal rights to accept work and to housing. Lastly, the cultural integration of immigrants is related to the rights they have to meet together as a group, and whether they are accepted. All dimensions of Penninx (2005) are focused on the citizenship of immigrants. These four dimensions will be used in this literature review, but with a more amplified vision and altered definitions based on the studies by Berry (1997) and Alencar (2018), since this article does not solely focus on refugees' citizenship.

Alencar (2018) also studied multiple dimensions of refugee integration, and defined four areas: means and markets, social connections-networks, facilitators and foundation and citizenship. This study was different from the study of Penninx (2005), since the dimensions of Pennix (2005) were centered around citizenship in their definition and application. Alencar (2018) used the dimension citizenship as one separate factor for integration and added three

other areas, without linking it to a concept. However, comparing both studies, the area means and markets from Alencar (2018) could be linked to the socio-economic dimension of Penninx (2005). In addition, social connections-networks and facilitators could be liked to cultural integration, and foundation and citizenship could be linked to political integration (Alencar, 2018; Penninx, 2005). For this study, both approaches will be combined to get a structured overview of refugees' use of ICTs when relocating.

For the purpose of this study, the basis of the integration framework developed by Berry (1997) will be taken into account, however, with some adjustments based on the studies by Alencar (2018) and Penninx (2005). Four dimensions of integration will be linked to the refugees' ICT use during their process of relocating in a new society: social, economic, cultural and political integration. Berry (1997) defined the social, economic and cultural integration, but the political integration was added from the study done by Penninx (2005) since the physical and biological integration from Berry (1997) are irrelevant to this study. The following definitions of the four dimensions of integration have been based on a combination of the three studies (Alencar, 2018; Berry, 1997; Penninx, 2005). Firstly, the social integration of refugees relates to the process during which refugees are incorporated and accepted into the social structure of the new society, and establish a sense of belonging. This especially relates to forming new social connections and networks like friendships, communicating with friends and family, but also participating in activities. Next, the economic integration relates to their participation in the labour market, such as their opportunities regarding jobs, their income level, and the possibilities they have regarding for instance trainings and education. Cultural integration refers to participating in the culture of the new society, while often maintaining their own culture. This for example relates to accepting values of the host society and learning the language. Lastly, political integration refers to whether migrants have the same political rights as locals, whether they are able to

participate in the new society's political life, and whether they accommodate to the policy of the government in the new country.

By combining definitions and aspects of three existing studies on dimensions of integration, a unique framework for dimensions of integration was developed for this literature review (Alencar, 2018; Berry, 1997; Penninx, 2005). The dimensions of integration will be used to analyze refugees' ICT use during their relocation in a new society. This can provide a clear and refined understanding of the many and sometimes complex ways in which technology is used during refugees' relocation. Therefore, refugees' ICT use in the integration process can help understand how they facilitate this process. This understanding is important, since it can for instance identify opportunities and challenges in using ICTs when integrating into a new society. These challenges and opportunities can possibly provide implications for policies to provide refugees with better access to ICTs, and can give insights in how integration can be optimized for refugees through ICTs. It is expected that social and cultural integration will be focused on mostly in previous research, since many studies examined aspects of refugees' relocation which are related to social networks and capital, connectivity, but also language learning and culture learning in general.

Method

In order to gain understanding of refugees' ICT use by critically examining existing research, this literature review was conducted by analyzing articles concerning refugees' ICT use during their journey, and when relocating. Therefore, existing literature was gathered and analyzed to generalize existing findings, identify gaps and present future suggestions and implications.

Research strategy

For this study, a systematic literature review was chosen to answer the research question. Fink's (2005, as cited in Okoli & Schabram, 2010, p. 3) description of a systematic literature review was the operative definition in this study: "a systematic, explicit, and reproducible method for identifying, evaluating, and synthesizing the existing body of completed and recorded work produced by researchers, scholars, and practitioners." A systematic literature review provides an overview of existing evidence by means of a clear research question, and critically selects, collects, and analyzes data from existing studies. (Kennedy, 2007). Five relevant steps for a systematic literature review that have also been used in this study are framing a research question, identifying relevant research, assessing the quality of studies, summarizing the findings and evidence, and interpreting the findings (Khan et al., 2003). However, for this literature review, the systematic review did not incorporate all elements that a typical one may include, since the topic is for example still emerging and often qualitative and explorative. Nonetheless, comparing and analyzing existing findings through a systematic literature review was of great value for this study, in order to identify what has been examined and where possible gaps in existing research arise. In addition, a thematic analysis was used to identify the most important and most frequent occurring themes in the analyzed articles, and to realize comparing and contrasting the findings of previous

research (Ward et al., 2009). In a thematic analysis, commonalities in a certain topic are identified and made sense of (Braun & Clarke, 2012).

Key terms and databases

For this systematic literature review, an article search was conducted using relevant databases. Examples of databases that were consulted for finding relevant articles were Google Scholar, Web of Science and EBSCO. To find relevant articles in these databases, words and word combinations were used. With the use of certain words and word combinations, articles with relevant titles and abstracts were gathered. Articles that seemed relevant and met the criteria for this literature review were fully read and analyzed in order to determine whether they were useful for this literature review. An overview of these key terms is presented in Table 1.

Table 1

An overview of the key terms used

Refugees	ICTs	Digital AND technology	Smartphones	Social media
Mobile AND communication	Smartphone AND communication	Asylum seekers	Forced AND migration	Integration
Technology AND use	Relocation	Mobile AND phones	Journey	Resettlement

Note. Each cell in the table independently represents a different search term or combination, so the columns and/or rows are not coherent

Criteria for relevance

This study solely focused on research in English, concerning refugees and their use of ICTs. The framework of this literature review was kept as wide as possible, meaning that for

instance the focus was not limited to a certain kind of ICT, such as Alencar (2020) did in her study by only focusing on mobile phones. In addition, there was no limit considering the region in which existing research was conducted, as well as to the method used in existing research. Some exclusion criteria to the selection of articles also were developed for this literature review. Firstly, studies about technology in general without a link to refugees or studies about refugees without a link to ICTs were not taken into consideration in the analysis. In addition, studies that did not have a direct connection to the use of technology by refugees themselves were also not taken into consideration. This could be for instance studies about refugee framing in the media by authorities or (news) agencies in the country of arrival. Taking the rapid change of technology into consideration, alongside with the start of the European refugee crisis in 2015 leading to a great deal of new research, mostly studies from 2015 until now were analyzed.

Procedure

After applying the inclusion and exclusion criteria, a larger list of articles was narrowed to 40 articles. This amount of articles was based on previous research by Alencar (2020), who used approximately 45 articles in her literature review on refugees' mobile communication and mobile phone use. However, this literature review is considerably different from the study by Alencar (2020), since it focuses on ICTs and not only on mobile phones. In addition, this literature review focuses on how refugees use ICTs themselves rather than on the role of mobile phones for refugees as Alencar (2020) did. This difference was further elaborated on in the Discussion.

Two differing situations for refugees were examined regarding refugees' ICT use. Firstly, their ICT use during their journey was reviewed and secondly, the ICT use during the relocation of refugees was reviewed. Therefore, articles with either the refugees' journey or the refugees' relocation with regards to their ICT use as a topic were analyzed for this

literature review. The division was similar, 20 articles related to the journey and 20 related to the relocation of refugees. In addition, in order to gain more knowledge and understanding about refugees' ICT use, certain information was extracted and analyzed from each article. Firstly, the method that was used, the location of the study, the amount of participants, and the origin of participants was extracted from each article which is visible in Table 2 regarding refugees' journey, and in Table 4 regarding refugees' relocation process. In addition, the used framework or concept, the kind of technology that was focused on, and the main results were extracted from each article which is visible in Table 3 regarding refugees' journey, and in Table 5 regarding refugees' relocation.

The thematic analysis happened at two levels. Firstly, findings of the selected articles were analyzed and similarities between articles were noted. This has been described in the Results section of this study. Secondly, the analyzed findings of the selected studies were reviewed based on the three theoretical frameworks. By applying affordance theory, the UGT, and dimensions of integration the presence and absence of certain themes or aspects of theories could be noted, such as for instance identifying in the selected literature which dimensions of integration have been touched upon, and which have not been touched upon. This was reported on in the Results section, and further elaborated on in the Discussion section. Regarding refugees' journey and relocation, affordances of technology and refugees' needs regarding ICT usage that were most commonly described were extracted from existing literature. This was done by applying affordance theory and the UGT. In addition, regarding the relocation, the most examined and mentioned types of integration were extracted by applying the dimensions of integration. This way, it was concluded which type of integration has received most attention in previous studies, and where gaps arise regarding this topic. To summarize, to form conclusions about the state of the literature, existing literature was analyzed by drawing themes and describing previous findings.

Results

This literature study reviewed an amount of 40 articles in total, to analyze refugees' ICT use during their journey and when relocating in a new society. A total of 20 articles were analyzed on the topic of refugees' ICT use during their journey, and for refugees' ICT use during their relocation, also 20 articles were analyzed. The theoretical overlaps in research were identified, as well as the gaps, and eventually were looked at through the lenses of affordance theory, the UGT, and dimensions of integration. In addition, four tables were included in this section to give an overview of the analyzed articles. Table 2 presents the methods, participants, and the location of the studies about refugees' technology use during their journey, and Table 3 includes the frameworks/concepts used, the technologies that were focused on, and the main results regarding this topic. Table 4 presents the methods, participants and location of the studies about refugees' technology use during their relocation, while Table 5 presents the frameworks/concepts used, the technologies that were focused on, and the main results regarding this topic.

ICTs during refugees' journey

To examine the ICT use of refugees during their journey, 20 articles have been analyzed. Sixteen studies dated from 2015 or beyond, so were published during or after the official European refugee crisis, except for four studies (Collyer, 2007; Collyer, 2010; Dekker & Engbersen, 2014; Schaub, 2012). In addition, the research purposes of the studies were very similar, to investigate how refugees use ICTs during their journey, refugees' needs in relation to technology during their journey, and how technology shapes refugees' journeys.

Regarding the methodology, 18 out of 20 studies relied on a qualitative method ($N =$ 18). This shows that there is not a great deal of diversity in methods amongst studies in this topic. In addition, most studies rely on interviews. Out of the 18 studies that used a qualitative method, one study combined a qualitative and quantitative method by conducting interviews

and analyzing social media data (Chamakiotis et al., 2022). Two studies solely used a quantitative method by conducting a survey (Borkert et al., 2018; Merisalo & Jauhiainen, 2020). In addition, 15 studies were conducted in Europe, while five studies were conducted outside of Europe. The studies outside of Europe were conducted in Ceuta, Morocco, Jordan, and the border of the United States and Mexico (Collyer, 2007; Collyer, 2010; Newell et al., 2016; Schaub, 2012; Wall et al., 2017). It is remarkable that three out of five studies conducted outside of Europe date from 2012 or before. Before the official refugee crisis in Europe since 2015, there was less research about refugees' ICT use, but the location of the studies was not as focused on Europe as in research from 2015 and beyond. Research from 2015 or beyond is comparatively more focused on Europe, as 13 out of 15 studies were conducted in Europe. The refugee crisis in Europe may have caused a wave in new research about refugees, and a shift in location and focus towards Europe.

Considering the participants in each study, the nationalities are diverse. Syrian and Iraqi refugees were examined the most, after which three random groups of participating migrants follow. These groups are often very large, such as the groups of Collyer (2007) ($N =$ 142), Collyer (2010) ($N =$ 142), and Merisalo and Jauhiainen (2020) ($N =$ 2.454). Migrants' or asylum seekers' use of technology was also examined by eight studies, however, they were of value for this study since refugees also are migrants, the groups of participants were large, and very likely consisted of refugees or were a mix of forced migrants (refugees) and non-forced migrants. Other nationalities that participated in studies were for instance Brazilian, Ukrainian, Afghan, Arab and Iranian refugees. An overview of methods, location of the studies, and participants of studies about refugees' ICT use during their journey is presented in Table 2.

Table 2

A systematic review of refugees' technology use during their journey regarding method, location, and participants

Author(s)/year of publication	Method	Location of study	Participants	Nationality
Alencar et al. (2019)	QL - interviews	The Netherlands	16	Syrian and Iraqi refugees
Borkert et al. (2018)	QN - survey	Germany	83	Arab refugees
Chamakiotis et al. (2022)	QN & QL - interviews & social media data	Greece	10	Syrian refugees
Collyer (2007)	QL - interviews	Ceuta and Morroco	142 & 38	Migrants and key informants
Collyer (2010)	QL - interviews	Ceuta and Morroco	142	Migrants
Dekker & Engbersen (2014)	QL - interviews	The Netherlands	90	Brazilian, Ukrainian and Morrocan migrants
Dekker et al. (2018)	QL - interviews	The Netherlands	54	Syrian asylum migrants
Fiedler (2019)	QL - interviews	Germany	36	Syrian and Iraqi refugees
Gillespie et al. (2016)	QL - interviews and computer analysis	France	18	Syrian and Iraqi refugees
Gillespie et al. (2018)	QL - interviews	France	-	Mainly Syrian and some Iraqi refugees

Gough & Gough (2019)	QL - interviews	Denmark	8	Syrian refugees
Kaufmann (2016)	QL - interviews	Austria	-	Syrian refugees
Kutscher & Kreß (2018)	QL - interviews	Germany	20	Refugees (10 different nationalities)
Latonero & Kift (2018)	QL - field observations	Serbia	-	Refugees
Merisalo & Jauhiainen (2020)	QN - survey	The EU	2.454	Migrants
Newell et al. (2016)	QL - interviews	US - Mexico	48	Mexican and Central/South-American migrants
Schaub (2012)	QL - interviews	Morocco	20	Sub-Saharan migrants
Steinbrink (2021)	QL - interviews	Germany	14	Asylum seekers (6 different nationalities)
Wall et al. (2017)	QL - interviews	Jordan	10 groups of 4-12	Syrian refugees
Zijlstra & Liempt (2017)	QL - trajectory ethnography	Greece and Turkey	11	Afghan, Syrian and Iranian migrants

Note. Method: Qualitative (QL); Quantitative (QN)

Some studies provided a clear theoretical approach which they used to conduct their research. Alencar et al. (2019) for example used the UGT to analyze their results, while Kutscher and Kreß (2018) used the capabilities approach in their study. Many other studies referred to concepts such as digital literacy, new "spatialities" of migration control, a structural change in migration systems, the concept of social media, or information precarity. In addition, two studies developed their own concepts, which were hybrid communities and chronic disruption (Chamakiotis et al., 2022; Gough & Gough, 2019). However, these concepts cannot be perceived as theories since there was no profound explanation or theory behind these concepts in the studies. Lastly, some studies did not refer to any concept or theory (Collyer, 2010; Dekker et al., 2018; Kaufmann, 2016).

The kind of technology that refugees mostly used according to the results, or that the researchers were most interested in, also differed between studies. Firstly, 13 studies found that smartphones were the most used ICT device by refugees, since this tool is most accessible during their journey and is best to fulfill their needs (Borkert et al., 2018; Gillespie et al., 2016; Wall et al., 2017). In addition, five other studies analyzed refugees' ICT use, with three studies having a focus on social media (Borkert et al., 2018; Chamakiotis et al., 2022; Dekker & Engbersen, 2014; Kutscher & Kreß, 2018; Merisalo & Jauhiainen, 2020). The two remaining studies focused on digital technology in general (Collyer, 2007; Collyer, 2010). The primary distinction in studies was that some focuses of researchers were broadened to ICTs or technology, while others narrowed their scope to smartphones.

Findings of the 20 studies were fairly consistent and similar. The results of multiple studies showed that ICTs, especially smartphones, are a vital tool and of great value in refugees' journeys (Borkert et al., 2018; Gillespie et al., 2016; Gough & Gough, 2019; Wall et al., 2017). Applying affordance theory to the findings of the analyzed studies, the affordances of smartphones especially allow refugees to keep moving and possibly travel to further

destinations (Collyer, 2007; Gillespie et al., 2018). This relates to for instance refugees'
ability to use GPS functions on their smartphone, as well as them being able to look for
previous experiences of other refugees who for instance completed the journey, and for
discrete information online (Collyer, 2010; Gillespie et al., 2016; Gough & Gough, 2019;
Kaufmann, 2016). ICTs also afford refugees to form migration networks that allow them to
keep moving and out of which they can obtain a great deal of valuable information (Collyer,
2007; Dekker & Engbersen, 2014; Zijlstra & Liempt, 2017). However, Merisalo & Jauhiainen
(2020) found that internet use amongst refugees decreased during their journey compared to
before starting the journey, due to a lack of devices and/or access to networks. In addition, the
affordances of the smartphones that allow refugees to keep moving also form a threat to them,
since they are presented with a great deal of dis- and mis-information, and authorities can
control migration through the technologies (Gillespie et al., 2018; Schaub, 2012). Newell et
al. (2016) also found that phones were often used during the journey, but when arriving at the
border, word-of-mouth was the most used communication technique to assess information
since refugees' lives are vulnerable at that moment.

Applying the UGT to the results of analyzed studies, refugees also use ICTs to fulfill
certain needs during their journey (Alencar et al., 2019; Gough & Gough, 2019). A study by
Alencar et al. (2019) revealed that refugees have multiple needs to fulfill during their journey,
for which they use their smartphone. The smartphone was seen as a companion, to remain
contacts with friends and family, as well as an organizational hub, to contact smugglers, or
use GPS for navigation. In addition, the smartphone was seen as a lifeline, for instance to
make calls during emergencies, and lastly the smartphone as diversion, used for entertainment
(Alencar et al., 2019). A study by Gough and Gough (2019) also revealed needs that refugees
fulfill through the use of ICTs during their journey, which are navigating, contacting friends,
family and smugglers, accessing communities, translating, taking photos, and building new

social relationships. Gratifications from the UGT that were most identified in existing research about refugees' journey regarding their use of smartphones were affection/sociability, immediate access, and mobility. Regarding refugees' use of the internet, the most identified gratifications from the UGT were the content and social gratification. Social media was also used during refugees' journeys, especially to maintain strong ties and connectivity with loved ones, establish new infrastructures with latent ties, address weak ties to organize migration, and to have a rich source of discrete insider information about migration (Dekker & Engbersen, 2014; Kutscher & Kreß, 2018). The gratifications that were mostly identified in existing research about refugees' social media use during their journey were social and affection, and cognitive needs. There remains a gap in comprehending how the affordance theory and the UGT might apply to the analyzed studies and findings, which will be examined on a deeper level in the Discussion.

An overview of frameworks or concepts used in the analyzed studies, the technologies that were focused on, as well as their main results is presented in Table 3, which is displayed on the following pages. After Table 3, the results of the analyzed studies regarding refugees' ICT use when relocating will be discussed.

Table 3

A systematic review of refugees' technology use during their journey regarding concepts/framework, technologies, and main results

Author(s)/year of publication	Framework used	Concept used	Kinds of technology	Main results
Alencar et al. (2019)	Uses & Gratifications:	-	Smartphones	Refugees use smartphones for four kinds of needs: the smartphone as a companion (connectivity loved ones), as an organizational hub (for instance smugglers / GPS), as a lifeline (emergencies), lastly the smartphone as diversion (entertainment)
Borkert et al. (2018)	-	Digital literacy	ICTs	Smartphones and their communication tools are of great value to refugees, and social media enables ties between family and friends and new people. Transnational networks are highly relevant to the journeys of refugees
Chamakiotis et al. (2022)	-	Hybrid communities (made themselves)	ICTs - social media	Social media has a shifting role in the journey of refugees, from country of origin to the place of arrival. Refugees go beyond social media's capabilities to develop a "hybrid community"

Collyer (2007)	-	New spatialities of migration control	Digital technologies	Migrants rely on technologies like financial transfers and communication technologies. Technologies have become widely accessible and allow migrants to keep moving, and remain connected to social networks
Collyer (2010)	-	-	Digital technologies	The development of refugees' journeys can be connected to the development of technologies, and these technologies can aid refugees in expanding their connections to gain more knowledge and information, and to therefore travel to further destinations
Dekker & Engbersen (2014)	-	The concept of social media	ICT - social media	Social media facilitates migration in 4 ways: maintaining strong ties with loved ones, establishing new infrastructures with latent ties, address weak ties to organize migration and integration, and having a rich source of unofficial and discrete insider information about migration
Dekker et al. (2018)	-	-	Smartphones	The majority has access to social media during and after their journey, but fear of governmental surveillance can restrict this. Also, migrants

				prefer online information from existing social ties based on personal experiences
Fiedler (2019)	-	Network and broadcast feedback	Mostly smartphones	Most refugees did not leave in a hurry, giving time to consider options and factors to prepare for the journey. Social media networks and personal contacts were indispensable for refugees before and during the journey
Gillespie et al. (2016)	-	Multi-mediality & smartphone affordances	Mostly smartphones	Refugees mostly use mobile phones, rely on phones for communication, navigation and information during the journey. After arrival, mobile phones also are very important for them to access information about for instance the European systems, the language, institutions and the culture.
Gillespie et al. (2018)	-	Smartphone affordances & infrastructures	Mostly smartphones	Refugees were exposed to a lot of dis- and misinformation and false rumors via social media networks, however, they depend on their phones during the journey. The digital aspects of the smartphone that allow refugees to keep moving also form a threat to them

Gough & Gough (2019)	-	Migration infrastructures	Smartphones	Smartphones are to refugees a vital tool in multiple ways, such as in navigating, contacting friends, family and smugglers, accessing communities, translating, taking photos, and building new social relationships
Kaufmann (2016)	-	-	Smartphones	The smartphone is helpful in three ways: as a pragmatic tool (e.g., GPS navigation), by giving refugees authority (e.g., access to check information), and it changes power relations between authorities and refugees ("new" refugees do not start from scratch)
Kutscher & Kreß (2018)	Capability approach	-	ICTs - digital media	Social media is vital regarding the connectivity of young refugees between their home country and the new society. In addition, the quality refugees´ social capital is of high importance regarding participation in the new society
Latonero & Kift (2018)	-	Infrastructure of "digital passages"	Mostly smartphones	Individual data collected by the government can be legitimate and helpful for refugees, however, these data-emitting infrastructures can also have potential negative impacts to refugees

Merisalo & Jauhiainen (2020)	-	The digital divide concept	ICTs	During the journey, the internet use decreases probably due to lack of devices and/or access to networks. However, after arrival at more stable places, many migrants use the internet even if they had never used it before
Newell et al. (2016)	-	Concept of the embeddedness of ICTs in migrants' daily lives	Technologies	Refugees used cell phones to contact people like friends and family, but at the border, word-of-mouth (not technology) is the most important source of information since their lives then are extra vulnerable (e.g., to abuse from traffickers/police)
Schaub (2012)	-	Communication infrastructure	Phones	Mobile phones have a transformational impact on how trans-Saharan migration journeys are constructed and carried out. Phones possibly facilitate migration journeys but the communication technology is also used by authorities to control migration
Steinbrink (2021)	-	Security and privacy	Smartphones	Asylum seekers rely on ICTs and smartphones during their journey, and the use of smartphones leads to increased autonomy which then

				leads to independence. This contributes to more safety and protection from for instance criminal exploitation
Wall et al. (2017)	-	Information precarity	Phones	Refugees see phones as a vital tool during their journey, since it can create, repair or remain strong connections. Refugees also view phones as a larger political context, to obtain news and updates about their home country
Zijlstra & Liempt (2017)	-	How mobile technology shapes journey	Smartphones	Smartphones can potentially increase the mobility of migrants by increasing the accessibility to online information during their journey and allow migrants to develop and maintain migrant networks

ICTs during refugees' relocation

To examine the ICT use of refugees during their relocation, 20 articles have been analyzed. Sixteen studies dated from 2015 or beyond, so were published during or after the official European refugee crisis, except for four studies (Charmarkeh, 2012; Cheah et al., 2011; Coddington & Mountz, 2014; Williams, 2006). In addition, the main research purposes of the studies were relatively similar, to investigate how and why refugees use ICTs during their relocation, how ICTs support refugees' integration process, and the role of technology in refugees' resettlement process. However, the studies did differ in their focus regarding the topic. For instance, some studies focused on the refugees' ICT use in relation to their integration process in general (AbuJarour & Krasnova, 2017; AbuJarour et al., 2017; Alencar, 2018; Alencar & Tsagkroni, 2019). Other studies focused more on refugees' social networks, social inclusion, and connectedness (AbuJarour et al., 2021; Bletscher, 2020; Williams, 2006). Lastly, some studies had a slightly differing focus than explicitly focusing on integration or social networks/inclusion in relation to refugees' ICT use. Coddington and Mountz (2014) investigated how detained asylum-seekers counter isolation by using technology. In addition, Leurs (2019) examined how refugees use ICTs to keep affectivity digitally when resettling.

Regarding the methodology of studies that examine refugees' ICT use when relocating, most studies relied on a qualitative method ($N = 19$). This displays that studies about this topic do not have a great deal of diversity in methods. Bletscher (2020) conducted a mix-methods approach where they combined quantitative and qualitative methods, by conducting interviews, a survey ($N = 70$), and by having a focus group. Only one study solely used a quantitative method which was conducting a survey ($N = 315$) (Cheah et al., 2011). In addition, 14 studies were conducted in Europe, of which a study by Bock et al. (2020) was conducted in the EU as well as in the US. Seven studies were conducted outside of Europe, of which one again was partly conducted in the EU. The studies outside of Europe were

conducted in Australia, the US, New Zealand, and Canada (Alam & Imran, 2015; Andrade & Doolin, 2019; Bock et al, 2020; Cheah et al., 2011; Coddington & Mountz, 2014; Mikal & Woodfield, 2015; Veronis et al., 2018).

Considering the participants in studies about refugees' ICT use during their relocation, nationalities again were very diverse, similar to studies about refugees' ICT use during their journey. Syrian refugees were examined the most across the studies. Other nationalities of refugees that participated in studies were for instance Eritrean, Afghan, Somali, Bosnian, Sudanese and Iraqi. Some studies featured large groups of participants, with differing nationalities. For instance, Coddington and Mountz (2014) examined over 200 migrants, Bletscher (2020) examined 195 refugees in their study, and Witteborn (2015) investigated 176 refugees. Only one study examined migrants' or asylum seekers' use of technology, which is still of value for this study since refugees are migrants but then forced, the group of participants was large, and likely consisted of refugees or was a mix of forced migrants (refugees) and non-forced migrants (Coddington & Mountz, 2014). In addition, AbuJarour et al. (2017) used 7 panelists in their study, of which mostly were researchers and professors. A panelist is "a person who is a part of a group of people who answer questions, give advice or opinions, etc.: a person who is a member of a panel" (Brittanica dictionairy, 2023). In the study of AbuJarour et al. (2017), the 7 panelists were scholars with expertise in social inclusion, refugee integration, e-government and ICT adoption. In another study, refugees as well as field operators from non-profit organizations were examined (Bock et al., 2020). Lastly, Anderson & Daniel (2020) interviewed eight refugees and two key informants regarding social media aimed at refugees in their study. An overview of methods, location of the study, and the participants of the analyzed literature is presented in Table 4.

Table 4

A systematic review of refugees' technology use during their relocation regarding method, location, and participants

Author(s)/year of publication	Method	Location of study	Participants	Nationality
AbuJarour & Krasnova (2017)	QL - interviews	Germany	15	Syrian refugees
AbuJarour et al. (2017)	QL - panel	Germany	7	Panelists (mostly professors and researchers)
AbuJarour et al. (2021)	QL - interviews	Germany	13	13 Syrian refugees
Alam & Imran (2015)	QL - focus group discussions	Australia	28	Refugees - 9 nationalities
Alencar (2018)	QL - interviews	The Netherlands	18	Syrian, Eritrean and Afghan refugees
Alencar & Tsagkroni (2019)	QL - interviews	The Netherlands	58	Syrian, Eritrean and Afghan refugees
Anderson & Daniel (2020)	QL - interviews	Norway	8 & 2	Young refugees and key informants

Andrade & Doolin (2019)	QL - interviews	New Zealand	58	Refugees - 7 different countries
Bletscher (2020)	QL - focus group & interviews + QN - survey	US, Florida	195	Iraqi, Burmese, Somali and Congolese refugees
Bock et al. (2020)	QL - interviews & grounded theory approach (analysis of networks)	Europe & the US	57	Refugees and NGO field operators
Charmarkeh (2012)	QL - field study	France	-	Somali refugees
Cheah et al. (2011)	QN - survey	The US	-	Bosnian refugees
Coddington & Mountz (2014)	QL - field research with interviews	Australian islands	200+	Migrants
Graf (2018)	QL - interviews	Sweden and Germany	7	Refugees
Kaufmann (2018)	QL - interviews	Austria	10	Syrian refugees
Leurs (2019)	QL - interviews	The Netherlands	42	Young refugees

Mikal & Woodfield (2015)	QL - interviews	The US	25	Iraqi and Sudanese refugees
Veronis et al. (2018)	QL - focus group discussion	Canada	29	Young Syrian refugees
Williams (2006)	QL - participative, ethnographic fieldwork	United Kingdom	15	Key refugees (originally 60)
Witteborn (2015)	QL - participant observations & interviews	Germany	176	Refugees

Note. Method: Qualitative (QL); Quantitative (QN)

Some studies provided a clear theoretical approach in order to conduct their research. AbuJarour and Krasnova (2017) for instance used the capabilities approach to analyze their results, while Cheah et al. (2011) used the Integrative Theory of Communication and Cross-cultural Adaption in their study. Lastly, the Systems Theory and Domestication theory were also used in existing research to analyze results (Graf, 2018; Kaufmann, 2018). Many other studies refer to concepts such as for instance social inclusion, digital divide, empowerment, refugee integration, ICT-mediated information practices, digital labour, concepts of place and space or the process of becoming. However, these concepts again cannot be seen as theories since there was no profound explanation or theory with these concepts in the studies, as well as the concepts from the studies about refugees' ICT use during the journey. Lastly, some studies did not refer to any concept or theory (Anderson & Daniel, 2020; Charmarkeh, 2012; Coddington & Mountz, 2014).

The kind of technology that refugees mostly use according to the results, or that the researchers were most interested in, differs between studies. Eight studies examined refugees' ICT use, of which Bock et al. (2020) focused on refugees' ICT use and on 47 ICT platforms for refugees, which are platforms oriented to refugees' needs in order to for instance facilitate their integration process. Five studies examined digital technologies such as for instance the internet, three studies (mostly) focused on smartphones, four studies focused on refugees' social media use during relocation, and one study focused on all kinds of media such as television, radio, (online) magazines and newspapers, and movies regarding host media use (Cheah et al., 2011). Considering the ethnic media use, Cheah et al. (2011) examined media platforms on which refugees could stay in touch with their own culture, by for instance seeking information or getting updates about their home country.

The focus of most studies was considerably similar when examining refugees' ICT use during their relocation in a new society. Most studies focused on social inclusion, making

connections and creating and maintaining relationships, since new technologies enable

refugees to build networks, enhance sociability and create social capital. Most studies

suggested that this benefits their social integration, and enables them to still maintain ties with

family and friends back home (AbuJarour et al., 2021; Alam & Imran, 2015; Alencar &

Tsagkroni, 2019; Witteborn, 2015). The use of ICTs when resettling can have a positive

impact on refugees' social inclusion, which in turn positively impacts their well-being

(AbuJarour et al., 2021; Bletscher, 2020). However, if refugees are not very familiar with

technology or have other issues such as the ability to afford a smartphone, ICT usage may be

constrained which in turn can have negative implications for their social inclusion (Alam &

Imran, 2015). ICTs were broadly described most used for connectivity and communication,

mobility, safety, translation, integration and maintaining a cultural identity (AbuJarour &

Krasnova, 2017). In addition, Bock et al. (2020) described eight main reasons why refugees

use ICTs during their integration: accessing government services, asylum processing,

integration, reunification, education, language and skill training, cash assistance, health,

livelihoods and business creation and, information gathering and dissemination. In order to

synthesize these results and identify gaps in the findings of the analyzed studies, a stronger

theoretical framework would be helpful, as examined in the Discussion.

     Applying affordance theory to the results of studies about refugees' ICT use when

relocating, the affordance of ICTs of always being available and accessible provides refugees

with a high feeling of empowerment (AbuJarour et al., 2021). They are in their own control of

their future and have authority about their decisions and the way they obtain information

(Veronis et al., 2018). In addition, the affordances of ICTs enabled refugees to use technology

to fulfill multiple needs. Applying UGT to the results of the analyzed studies, refugees for

instance have the need to communicate, in order to stay in touch with loved ones and remain

those relationships or to build relationships in the new society (Alam & Imran, 2015; Alencar

& Tsagkroni, 2019; Leurs, 2019). Therefore, the analyzed research showed that refugees mostly used mobile phones according to the UGT for affection/sociability and immediate access. According to the analyzed literature, the internet was mostly used for the social gratification. In addition, studies showed that social media was mostly used by refugees for social and affection, and cognitive needs. Lastly, by applying the dimensions of integration to findings from studies regarding refugees' ICT use when relocating, the social and cultural dimensions appeared to the greatest extent in the studies' results. Most studies for instance examined social capital, social relationships, social networks, cultural identity or language learning (AbuJarour & Krasnova, 2017; Alencar & Tsagkroni, 2019; Graf, 2018; Witteborn, 2015). There remains a gap in the comprehension of how these theories with their categories can apply to the broader set of analyzed studies and findings, which is further examined and described in the Discussion.

An overview of the frameworks or concepts used in previous studies, technologies that were focused on, and the main results is presented in Table 5, which is displayed on the following pages.

Table 5

A systematic review of refugees' technology use during their resettlement regarding concepts/framework, technologies, and main results

Author(s)/year of publication	Framework used	Concept used	Kinds of technology	Main results
AbuJarour & Krasnova (2017)	Capability approach	-	ICTs	Refugees mostly rely on smartphones during their resettlement. Smartphones are most used for connectivity and communication, mobility, safety, translation, integration and maintaining a cultural identity
AbuJarour et al. (2017)	-	Social inclusion	ICTs	Refugees come across three main groups of stakeholders: government and authorities, the local population and businesses. For every stakeholder, they propose future agendas which questions to how ICTs could be optimally implemented for refugees
AbuJarour et al. (2021)	-	Empowerment	ICTs	The possibility for refugees to use smartphones anywhere and at any time gives them a feeling of empowerment regarding global connectivity. In addition, connectedness to loved ones and to locals is good for their well-being and empowerment as well

Alam & Imran (2015)	-	Social inclusion and digital divide	ICTs	Opportunities in using ICTs can support refugee groups' social inclusion. Refugees viewed the internet as a useful means to communicate, exchange information, interact and assimilate into the community
Alencar (2018)	-	Refugee integration	Mostly smartphones	Refugees prefer social media platforms over other internet applications. They mostly used social media platforms regarding integration to learn the language, build social capital and learn about the culture
Alencar & Tsagkroni (2019)	-	Concept of integration	ICTs	Social capital and social trust are essential for strong indicators of integration. According to refugees, them volunteering and participating in civil engagement highly impacts social capital which in turn creates opportunities for better relationships amongst each other and the locals
Anderson & Daniel (2020)	-	-	Social media	Refugees mainly use social media to communicate, to learn and to access information. Social media offers 5 capabilities that influence their well-being: social connectedness, effective communication, self-expression, access to information and learning opportunities

Andrade & Doolin (2019)	-	ICT-mediated information practices	ICTs	Refugees' ICT practices change when their temporal orientations also change. ICTs are of high importance for refugees regarding closing social and informational gaps, and facilitates participation in a new society
Bletscher (2020)	-	Well-being in the integration process	Technologies	Younger refugees made more use of technologies than older refugees. Also, technology provided benefits for integration. It provided participants with easy and quick access to maintaining and establishing relationships
Bock et al. (2020)	-	-	ICT platforms	Refugees use ICT platforms for eight main reasons: accessing government services, asylum processing, integration, reunification, education, language and skill training, cash assistance, health, livelihoods and business creation and, information gathering and dissemination
Charmarkeh (2012)	-	-	Social media	Somalis use social media as much as traditional media, however, social media fulfills other functions such as enable mobility and create a safe refuge. Traditional media in France gives them insights into the French culture
Cheah et al. (2011)	Integrative Theory of	-	Media	Host language competence, media use and ethnic and host interpersonal relationships all positively contribute to the adaption of refugees. In addition,

	Communication and Cross-Cultural Adaptation			when refugees' host media use increases, their US cultural identity salience increased, which is similar for the ethnic media use and ethnic identity
Coddington & Mountz (2014)	-	-	Social media	Accessibility to technology counters isolation since it allows detained asylum-seekers to maintain or expand networks, transmit information and facilitate better assistance
Graf (2018)	Systems theory (a communication theory)	Social relations - trust/distrust	Technologies	The internet brings more opportunities to build trusted relationships since it is online easier to make risk evaluations due to others' knowledge and evaluations
Kaufmann (2018)	Domestication theory (appropriation of ICTs at home)	-	Smartphones	Smartphones are a key tool to refugees in a new society and are most used for geographical orientation and place-making, information access and self-help, language learning and translating, and doing family
Leurs (2019)	-	Digital care labour	Mostly smartphones	Refugees use technologies to mediate being co-present, so to also stay connected to loved ones abroad. This co-presence does trigger forms of

				affectivity which means that this feeling now can circulate amongst loved ones through digital networks
Mikal & Woodfield (2015)	-	Internet-mediated social support	Technologies	Refugees have post-migration stressors and although they mention to seek support online, many refugees are reluctant to explore online or form online support groups. Refugees had a willingness to engage online, but there was limited prove for internet used effectively to reduce stressors
Veronis et al. (2018)	-	The concept of transculturality	ICTs & social media	ICTs and social media are highly important in the resettlement of young refugees, since it supports transculturality and it allows them to have control over their own resettlement experience and of their future
Williams (2006)	-	Concepts of place and space	Technologies	Networks of weak ties and transnational networks are communities that have a great influence on refugees' daily lives. Technology may maintain these networks and this contact is seen as a priority by refugees
Witteborn (2015)	-	The process of becoming	Technologies	New technologies enable refugees to enhance sociability and build networks. This enabled sociability enhances individual and shared ways of relating, knowing, and becoming for refugees

Discussion

In order to identify how refugees use ICTs during their journey and when relocating, a literature review was conducted. The analyzed literature covers a range of methods, topics and regions, and there are some gaps in the way these studies are approached. ICTs, especially smartphones, are a vital tool in the journey of refugees that allow them to keep moving, and that fulfill their needs during the journey such as remaining contacts with loved ones. ICTs are also highly important during refugees' resettlement, as ICTs can benefit their integration and especially social inclusion while it also allows them to maintain ties with loved ones at their home country. In this section, it will become clearer what the studies have in common, where they differ, and what theoretical frameworks could help explain some results and point to new directions. By applying affordance theory, the UGT, and dimensions of integration, existing research was synthesized. Therefore, gaps in existing research can be identified, and eventually propositions for future research can be made.

Although this study focused on analyzing studies about refugees' ICT use from inside as well as outside Europe, most studies were conducted inside of Europe ($N = 29$). For future research, it might be valuable to examine refugees' ICT use in countries outside of Europe. Other countries may have other regulations regarding refugees, but also probably have highly differing cultures. Integration and for instance language learning might be very different for refugees in Asia compared to refugees' integration process and language learning in Europe. Refugees might possibly use ICTs in other ways in Asia to develop and enhance their cultural identity, or to create new social networks, since ICT adoption and use can differ between cultures (Erumban & De Jong, 2006). In addition, most studies used a qualitative method to obtain results ($N = 36$). Future studies could rely more on quantitative research methods such as surveys in order to reach more participants within a study, and gain more generalizable results from a larger amount of responses. Qualitative research methods like interviews which

were often used in refugee studies, are often based on smaller sample sizes, while quantitative

data such as surveys can reach a much larger sample size. Quantitative data is in this case

more generalizable for the population than qualitative data. However, qualitative data can

offer more insights and a greater understanding about this topic in particular than quantitative

data such as surveys, so therefore this method is probably most used. In addition, practical

difficulties in recruiting refugees for research could also be the reason for the large amount of

qualitative research. It is often difficult to reach refugees, and when they are recruited,

methodological challenges can occur (Fiedler, 2019). Many refugees suffer from post-

traumatic stress disorders due to traumatic experiences in their home country and during their

journey. Therefore, researchers who conduct interviews with refugees need to be culturally

sensitive, as well as very empathic (Fiedler, 2019). With quantitative research such as a

survey, it can be more difficult to reach refugees, persuade them to participate, and most

importantly, to be considerate of them by showing empathy and understanding.

Previous studies have applied some theories or concepts in order to have a focus in

their research, or to synthesize their findings. Firstly, the concepts identified in the analyzed

studies cannot be seen as theories, since there were no profound theories or explanations to

these concepts. Therefore, these concepts can be seen as more of a limited phenomenon. For

example, Borkert et al. (2018) referred to the concept of digital literacy as an indication of

refugees' ICT use, since digital literacy in their study indicates how refugees assemble

knowledge, process information, search online, and navigate on the internet. Some studies

also referred to the affordances of technology, without referring to affordance theory and thus

providing an explanation or definition (Gillespie et al., 2016; Gillespie et al., 2018;

Kaufmann, 2018). Therefore, these studies were not implementing affordance theory,

however, they were using affordances of technology as a concept. In addition, the theories and

concepts used in previous research are not versatile enough to explore existing literature in

depth. They do not include multiple aspects that can be used to extract different themes from results or to explore which themes or aspects have not been examined yet, except for the UGT which Alencar et al. (2019) utilized in their study. For instance, the capabilities approach referred to subjective capabilities which are the actual resources refugees have, and the linguistic capabilities which for instance refer to their social capital that provides access and support for their media use (Kutscher & Kreß, 2018).

To synthesize the results of the analyzed literature, three theoretical frameworks have been applied. Affordance theory, the UGT and dimensions of integration will aid in generalizing results of studies about refugees' ICT use, as well as in seeing where possible opportunities for areas to strengthen are.

Uses and gratifications theory

The UGT is a promising theory for synthesizing current research and pointing to directions for growth regarding refugees ICT use. The UGT aids in finding out how refugees use ICTs to fulfill certain needs, since this theory is based on the perception that media and technology are used by people to satisfy their needs (Wu et al., 2010). Gratifications of technology use can be divided in three types of technology or media: mobile phone, the internet and social media. Before conducting the literature review, it was expected that findings from existing research would show that refugees use mobile phones mostly for immediate access and mobility during the journey, and for affection/sociability and immediate access when relocating. In addition, it was expected that existing research would show that refugees use the internet mostly for the content gratification during the journey, and for the social gratification when resettling. Lastly, social media was expected to be used for the gratifications recognition, social and affection, and cognitive needs during resettlement, based on the results of the analyzed studies.

After analyzing the results of the studies about refugees´ ICT use during their journey, the expectations mostly matched the outcomes. For the mobile phone usage during the journey, the most used gratifications that were identified in results from analyzed studies were affection/sociability, immediate access and mobility. Refugees for instance used phones to stay connected to loved ones, to organize their journey regarding navigation, for communication purposes and to obtain information (Alencar et al., 2019; Gillespie et al., 2016; Gough & Gough, 2019; Wall et al., 2017). Regarding the internet, the social and content gratification were mostly used. Refugees used the internet to find specific information about their journey, and to stay in contact with loved ones while also forming new ties (Borkert et al., 2018; Collyer, 2007; Dekker & Engbersen, 2014; Newell et al., 2016). Lastly, for social media, social and affection and cognitive needs were identified as the most used gratifications based on the findings from the analyzed studies. Refugees go beyond the capabilities of social media to create a "hybrid community" (Chamakiotis et al., 2022). In addition, Dekker and Engbersen (2014) emphasized that refugees use social media to maintain strong ties with friends and family, to establish relationships with new ties, to address weak ties to arrange migration and integration, and to have a rich source of insider information about migration.

For refugees in the process of relocating, the expectations before conducting the literature review also mostly matched the outcomes. Findings from existing research showed that the mobile phone was mostly used for affection/sociability and immediate access, and the internet was used for the social gratification. Refugees mostly relied on smartphones during their resettlement, especially for communication with loved ones or new ties and to integrate in the new society (AbuJarour & Krasnova, 2017; AbuJarour et al., 2021; Alencar, 2018; Bletscher, 2020; Leurs, 2019). In addition, previous research showed that refugees mostly used social media to meet the social and affection, and cognitive needs gratifications. Social

media is mostly used by refugees to communicate, learn and to access information, but it also fosters mobility and a safe refuge (Anderson & Daniel, 2020; Charmarkeh, 2012; Veronis et al., 2018).

Although a broad scope of research is emerging for refugees' ICT use, some gratifications have not been touched upon by existing research. Looking at the five original gratifications people use media for, combined with the four new (social) media gratifications, the following list arises: information, social interaction, personal identity, entertainment, an escape from the daily life, knowledge about other people, coolness, creativity, and documentation. Considering the results of analyzed studies, refugees use technology for the following gratifications: information, social interaction, personal identity, knowledge about other people, and documentation. The gratifications that previous research barely touched upon are entertainment, an escape from the daily life, coolness, and creativity. Only Alencar et al. (2019) found that refugees use smartphones for entertainment.

The UGT explains that people turn to media to satisfy a range of human needs, and it could be expected that refugees have a similar range of needs. Some needs that refugees have are magnified or more important, however, refugees might also use media for all kinds of needs, not only the need for social interaction or culture learning. For instance, they might also have the need to relax or escape reality. It might be interesting to investigate in future research how refugees use ICTs to escape reality or entertain themselves, in order to relax during for instance the integration process when resettling or during the challenging journey. To reflect this path forward for research, there are some studies that might help in guiding this agenda of examining other possible needs that refugees might have when using ICTs. For instance, Bieser and Hilty (2020) have examined the gratification of relaxation, which relates to the gratifications of entertainment and an escape from daily life, in relation to daily time and energy use related to people's ICT use. In addition, other studies have found that ICTs are

used for entertainment and creativity by multiple audiences, and these studies can also function as a guide to examine possible needs to why and how refugees use ICTs (Fitriah, 2018; Prado et al., 2011).

Affordance theory

Affordance theory is another promising theory that helps clarify the interdependent relationship between the user and the technology, while paying attention to all of the elements and features of technology (Hutchby, 2001). The theory aids in synthesizing previous research which leads to further understanding of refugees' ICT use. ICTs have a great deal of affordances which enable refugees to meet certain goals. Affordances of technology can both be explicit, like buttons or text boxes, as implicit, like acts or happenings emerging from the user's technology use based on their knowledge. Implicit affordances of an object are hidden and may appear when a user performs a certain action (Jain, 2023). In this study, the emphasis is on implicit affordances of technology. An affordance of an object, and in this case of ICTs, is a perceived use. It does not only exist in the object, but it is what it communicates to a user and what is possible within the object. Refugees have for instance a smartphone and use it, but the affordance of that smartphone is particularly specific to their context. This study does not focus on what explicit affordances refugees turn to when utilizing for instance a mobile phone, such as which buttons or text boxes they employ. Instead, this study analyzes the implicit affordances that appear through refugees' use of technology based on their knowledge, to reach certain goals and satisfy certain needs. Most existing research, including the analyzed research in this literature review, focuses on implicit affordances of ICTs by for instance analyzing how refugees use ICTs to guide their journey or to pursue relocation in a new society.

The most important and frequent affordances of technology that were covered in existing literature were affordances regarding locations, communication and networks, and

information obtainment. However, the affordances of always being locatable and being able to find information about ways to travel also bring risks for refugees. These affordances can be perceived as helpful or neutral for other populations, while they can bring risks for refugees. Refugees can possibly receive mis- and disinformation, and they are susceptible to being scammed by smugglers. Refugees' digital traces such as texts, photographs and data are also a threat to them which increase their vulnerability during the journey, since these digital traces can for instance lead to unwanted state control. Nonetheless, refugees have developed ways to mitigate and control these risks. For example, when they do not trust a smuggler but they have to take the dangerous boat trip, refugees use GPS to control whether the smuggler is taking them to the right destination (Gillespie et al., 2016; Gillespie et al., 2018). In conclusion, information services particularly for refugees could be risky due to their semi-legality and risks for control by authority services.

The results in this literature review considering affordance theory are largely in line with the results of Alencar's (2020) study on the role of mobile phones for refugees during their journey. Alencar (2020) also identified the affordances of always being locatable and able to navigate the journey, as well as forming migratory networks to facilitate the journey. This study, additionally to Alencar's (2020) study, identified information obtainment as an important affordance of ICTs for refugees, since they rely on for instance experiences from other forced migrants (Dekker & Engbersen, 2014). However, Alencar's (2020) findings on the role of mobile phones for refugee relocation differed from the findings in this study, since the focus was different. This study focused on refugees' own use of ICTs, while Alencar's (2020) study focused on the role of the device for refugees. The results in the study by Alencar (2020) focus on for instance refugees' digital literacy and that mobile phones foster learning and skill development, face-to-face interventions regarding health and the attitude and behavior of the host society towards refugees. In comparison, Alencar (2020) has a focus

on the role of mobile phones and the environment refugees are in, while this literature review focuses on refugees' own use of ICT and their needs for technology use.

The difference in focus between this literature study and Alencar's (2020) literature study is of great importance since this literature review provides new insights into existing knowledge. It is crucial to study how refugees use ICTs themselves which highlights their active participation in using technology, and not only the role of mobile phones for refugees what is done by Alencar (2020), in order to gain a larger understanding of how they use ICTs to pursue their journey and how they relocate. The usage of ICTs in refugee environments could be better understood when their activities and experiences are taken into consideration. By analyzing existing studies regarding refugees' ICT use, the knowledge that already exists on this topic is identified and synthesized, as a tool for future data collection. In addition, researching existing literature on refugees' ICT use shows what is still missing, what also is of great value from existing knowledge. Are certain topics or aspects for instance more often highlighted in existing research than other aspects of refugees' ICT use, because refugees do not use ICTs for other purposes? Or have these purposes not been examined yet because researchers were not interested in those aspects?

Most studies are focused on the affordances that evolve from refugees' technology use, so based on the habits and knowledge they have of technology. The studies for instance focus on how refugees seek for information to guide their journey, or how they use technology to form and maintain social networks. So, the implicit affordances of refugees' technology use have been mostly highlighted in previous research, by looking at how refugees use ICTs to meet certain goals and needs. It might be interesting for future research to examine which kinds of other affordances technology contains that might be relevant for refugees, by zooming in on the less obvious or more explicit affordances of technologies. How and through which explicit tools of ICTs do refugees pursue and make use of their

locatability during their journey? Or do refugees for instance use ICTs as a means to relax and be distracted during the complex journey, and when relocating? It might be interesting to zoom in on different aspects regarding ICT use in refugees' journey and relocation, in order to better understand their technology use.

Dimensions of integration

Lastly, dimensions of integration is a promising theoretical framework to further understand refugees' ICT use during their relocation, to identify how technology is used for integrating into a new society. Three frameworks of Alencar (2018), Berry (1977) and Penninx (2005) have been synthesized in order to form a unique and appropriately defined framework for the purpose of this study. It was expected that studies about refugees' resettlement would focus mostly on social and cultural integration, and this expectation was correct. Most studies focused on aspects such as social connectedness, maintaining and developing a cultural identity, social inclusion, language learning, social capital, and learning about the new culture (AbuJarour & Krasnova, 2017; Alam & Imran, 2015; Alencar, 2018; Kaufmann, 2018; Witteborn, 2015). The political and economic integration of refugees during their relocation are barely touched upon within the studies of refugees and ICT usage.

One analyzed study did contain evidence for refugees using ICTs to pursue political and economic integration. A study by Bock et al. (2020) found that refugees use ICT platforms for eight main reasons, of which five reasons relate to political and/or economic integration: accessing government services, asylum processing, education, cash assistance, and livelihoods and business creation. Their focus thus was very broad when interviewing refugees, and found eight reasons to why refugees' use ICTs related to all four dimensions of integration (Bock et al., 2020). The focus of other studies was broad as well, for instance on how media or technologies support refugees' integration process into a new society. However, most findings eventually focused on the aspects that relate to social and cultural integration.

Some studies also had a more narrow focus, such as social inclusion, well-being, connectivity or support (AbuJarour et al., 2021; Andrade & Doolin, 2019; Bletscher, 2020; Mikal & Woodfield, 2015; Veronis et al., 2018).

Future studies could possibly focus more on the economic and political integration of refugees within the studies of ICTs, since these aspects are also highly important parts of establishing a new life. It is important to find out whether refugees have the same opportunities as locals, if they can access education, get a job, and for instance are able to politically make decisions once they are integrated. It is also interesting to see how refugees use ICTs to enable themselves towards these opportunities, and how they might be helped. Maybe ICTs do not have the capabilities of enhancing economic and political integration for refugees, and there are opportunities for developments in this area to aid refugees in the integration process. It could also be the case that ICTs do have the capabilities to enhance economic and political integration for refugees, but the researchers in existing literature were not as focused on those aspects of integration as on the social and cultural integration of refugees.

Limitations

While this literature review about refugees' ICT use during the journey and when relocating offers valuable insights, limitations must be considered. Firstly, there is a possibility that this literature review does not cover every relevant study or publication due to limited resources, time, and access to certain sources or databases. In addition, some analyzed studies might have limitations regarding their sample size or methodology, but it is a challenge to assess the quality and reliability of all included studies. Lastly, only studies in English were taken into consideration for this literature review, which may cause a limitation. Studies in other languages might have been of high value for this literature review, but were not taken into consideration since they did not meet the criteria for this study.

Conclusion

The goal of this literature review was to analyze and synthesize findings from existing research, in order to better understand refugees' ICT use and the current state of the research on this topic. By synthesizing current knowledge through applying affordance theory, the UGT, and dimensions of integration, gaps in existing literature were identified and suggestions for future data collection were made. Most studies found that refugees mostly used smartphones during their journey and when relocating, since this device is most accessible to them (Alencar, 2018; Borkert et al., 2018; Kaufmann, 2018; Wall et al., 2017). ICTs increase refugees' safety, but can also increase risks during their journey (Gillespie et al., 2018). ICTs also give refugees the opportunity to form new networks while still maintaining old networks and relationships. This increases their mobility, knowledge and safety during the journey, while it also increases their social integration and maintenance of cultural identity during relocation (AbuJarour & Krasnova, 2017; Bletscher, 2020; Gough & Gough, 2019). The most important affordances of technology that were identified in the analyzed literature were affordances regarding information obtainment, communication and networks, and locations. ICTs also allowed refugees to fulfill certain needs. Generally, existing research has shown that refugees fulfilled needs by using ICTs regarding information, documentation, personal identity, knowledge about other people, and social interaction gratifications. Previous research did not touch upon entertainment, coolness, escape from daily lives and creativity as gratifications. Lastly, during refugees' relocation in a new society, research mostly covered social and cultural integration, disregarding political and economic integration as topics.

This literature review gave the opportunity to identify some practical implications. First, by understanding refugees' ICT use and their needs on a deeper level, institutions might for instance help and educate refugees in a more efficient way. Smartphones might have more

affordances than refugees currently obtain from the devices, since their knowledge is limited to the affordances that are already familiar to them. By educating refugees about an amplified range of affordances that might be of great value to them, they could be able to use smartphones in a more efficient way. Refugees may differ in technological knowledge, and some might not be accustomed to using ICTs or possess digital literacy abilities. Training programs may be created to provide refugees with digital skills based on their already known ICT usage patterns. These training programs could be altered towards their specific needs, and may involve showing them for instance how to use the internet, how to make use of communication applications, how to apply for education or how to search for jobs. Therefore, the economic and political integration of refugees can be enhanced, since previous research has shown that these aspects of integration received relatively limited attention and are an understudied topic compared to refugees' social and cultural integrations. In addition, information and communication strategies can be altered to match refugees' ICT use and thus their online preferences. This can possibly involve distributing information about accessible services and legal rights by using preferred communication methods which were identified from their ICT use, such as mobile apps or social media platforms. By identifying how refugees use ICTs and which platforms they prefer, access to important information can also be increased and simplified for refugees.

There possibly are multiple ways by which training programs or communication strategies could be altered by institutions to aid refugees in daily life struggles. Most studies currently focus on ICT use regarding social and cultural integration while refugees are relocating, while aspects as information on healthcare, education, work prospects or legal processes can be difficult for refugees. Institutions could aid in filling this gap and providing refugees with tailored online platforms to deliver easily assessable and helpful information. This can also contribute to fulfilling refugees' needs when it comes to ICT usage during the

journey and when relocating. During the journey as well as when relocating, refugees could for instance be helped when specific platforms are created that aid them in registration processes, documentation, and receiving social benefits. However, strong needs regarding social and cultural integration and social connections during refugees' journey that already have been identified in existing literature could also be intensified and aided. ICTs already are helpful in aiding and promoting integration and create linkages between refugees and the local population, while still maintaining contacts with loved ones. Understanding how refugees use ICTs to integrate and create and maintain contacts can allow for the development of new and efficient online communities where refugees could share experiences, support, information and acquire information.

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