

# Falling between the cracks: Bedouin students and the digital divide during the Covid-19 crisis

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To cite this article: Abu-Kishk, H., & Mendels, J. (2024). Falling between the cracks: Bedouin students and the digital divide during the Covid-19 crisis. *World of Media. Journal of Russian Media and Journalism Studies*, 2, pp. 116-130. DOI: 10.30547/worldofmedia.2.2024.7

## Abstract

The Covid-19 pandemic led to the closure of schools and higher education institutions worldwide, necessitating a shift to distance learning. This transition had significant impacts on working conditions, education, the economy, and the environment. Access to infrastructure and information and communication technologies became crucial for students to continue their academic studies. However, marginalized communities in Israel faced additional challenges due to existing social gaps. This study focuses on Bedouin students in southern Israel attending higher education institutions and examines the difficulties they encountered during the transition to distance learning. Using a quantitative methodology, data were collected through an online questionnaire distributed to 257 Bedouin students during the first Covid-19 outbreak in Israel (April-July 2020). The research aimed to identify the types of digital divide experienced by Bedouin students and explore how this gap influenced their learning experiences. Results show that Bedouin students faced significant digital inequality, lacking the necessary prerequisites for distance learning, mainly due to limited access to digital devices and a stable Internet connection. These findings shed light on the specific challenges faced by the research population and emphasize the need to address these challenges to ensure equitable and inclusive education for all.

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## Keywords

Digital divide, marginalized communities, Bedouins, distance learning, Covid-19 pandemic.

## Introduction

The closure of schools and institutions of higher education during the Covid-19 pandemic has impacted working conditions, education, the economy and the environment worldwide. In an attempt to cope with the new situation, these institutions were required to switch to distance teaching (Corbera et al, 2020). Students' ability to continue their academic studies significantly became directly dependent on their access to infrastructure and information and communication technologies (ICT), as well as their proficiency in the skills required for distance learning. (World Bank, 2020). The need to switch to distance learning placed difficulties on all students, but more so for members of marginalized communities in Israel, who are among the poorest in the nation. It therefore further highlighted the social gaps in Israel, which, according to OECD data, are among the highest in the organization's countries (Dahan et al, 2020).

Taking part in distance learning requires meeting two prerequisites: ownership of a digital device suitable for learning and a stable Internet connection, and a level of digital literacy that allows these devices to be used for learning (Abu Kishk, & Mendels, 2021). Alongside these, other factors affect the ability to participate in learning, such as the existence of a free space to study in, a supportive environment, and more. Bedouin students in Israel – a vulnerable marginalized population that was suffering even before the pandemic from a lack of infrastructure, a low level of education, and great poverty (CBS, 2019) – often did not meet these two prerequisites and therefore lacked the necessary conditions for distance learning.

This research focuses on Bedouin students attending institutions of higher education in southern Israel. The study assumes that this group experienced significant difficulties in the transition to distance learning due to the gap in digital access among the Bedouin population in Israel. The data were collected during the first outbreak of Covid-19 in Israel, in April-July 2020, and attempted to map out the types of digital divide Bedouin students faced. In addition, it examined how this gap affected their learning experiences. The methodology used is quantitative, and the findings are based on an online questionnaire distributed among Bedouin students (N=257).

The main research questions were the following ones: are Bedouin students suffering from digital inequality? To what extent? If so, what are its prominent expressions and effects on their ability to participate in distance learning?

## Theoretical background

The digital divide – also known as digital inequality – is the inequality between those who have access to ICT and know how to best use these technologies and those who do not have such access or knowledge (Van Dijk, 2020). This inequality is not only a technological issue but also a complex social, economic, and political problem that leads to a further deepening of social and socioeconomic gaps (Abu Kishk, Lev-On, & Steinfeld, 2022).

Scholarly literature on the subject refers to three levels of inequality (Ragnedda, & Kreitem 2018; Vartanova et al., 2021):

1. Access: dependency on adequate local infrastructure in the living environment, from electricity to phone lines, as well as the economic means to own a user platform such as a computer or tablet (Hargittai, 2003);
2. Utilization: disparities in technological literacy or skills, affecting the ability to make use of ICT, or in other words, how the individual gains by interfacing with the technology;
3. Participation: stemming from the previous two levels, a disparity in user experience between those who have high rates of access to ICT and those who do not (Van Deursen, & Helsper, 2015).

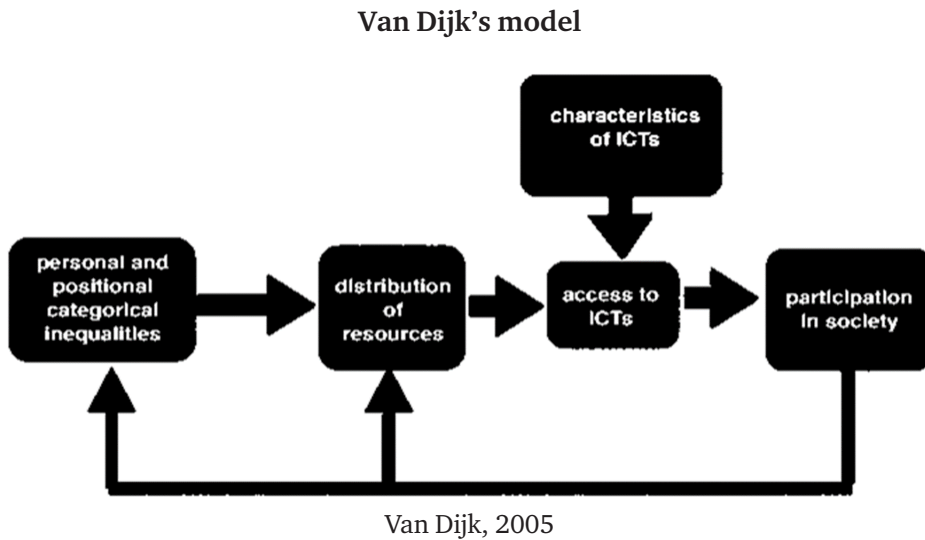
Of the three, inequality in utilization is considered the most significant; mere access to ICTs, without the skills to use it, does not allow for any change. This relates to a broad range of requirements to the technological savviness of the user, including orientation in new media, sources of information, multimedia texts, and data processing (Eshet-Alkalai, 2004). Facility with multiple technological tools and the ability to combine methods and treat information sources critically is also important in ICT utilization. Many studies go as far as defining these skills as vital to success in the modern world (Zelicha, 2012).

The digital divide is recognized today as one of the most prominent inhibitors of personal and social development in modern society (Ganaim et al., 2009, Abu-Kishk, & Mendels, 2021) and has also been found to replicate and reproduce existing socioeconomic gaps (Chinn, & Fairlie, 2007): those affected by it will suffer discrimination in employment, income, and education, thereby perpetuating or widening existing gaps. This gap can exist among countries, different groups in a society or individuals (Rogers, 2001).

Van Dijk (2005) proposed a model tracing the origins of digital inequality (*Figure 1*): social inequality generates unequal distribution of resources, leading to unequal access to ICTs, leading to unequal participation in society at large, resulting in increased inequality, and so forth. The consequence is the exclusion

of certain populations from social development since any person's participation in modern society has become dependent on their technological skills. Appropriately, many states consider the minimization of digital inequality to be in their citizens' interest, rationalizing that this directly and positively affects the quality of life, existing social inequality, and social cohesion (Rafaeli, Albo, & Shiti, 2013).

Figure 1



### The Bedouin population in the Negev

The Bedouin population in the Negev is a traditional Muslim minority group currently numbering some 270,000 people, constituting about 3.5% of Israel's population and close to 30% of the population of the Negev (Abu-Kaf, Schejter, & Abu-Jaffar, 2019). Like all Arab citizens of Israel, since the establishment of the state, the Bedouins have suffered institutionalized discrimination (Tamir, & Gontovnik, 2017). However, the discrimination against the Bedouin population has unique characteristics: the government's policy in their case seeks to confine the population, which is fundamentally nomadic, to permanent cities and settlements. About 120,000 Bedouin residents live in communities that have not been recognized by the state, and therefore the state refuses to connect them to basic infrastructure: roads, water supply and electricity (Abu Kaf, 2019). All Bedouin localities are included in socioeconomic cluster 1, which is the lowest, and suffer from poverty (CBS, 2019).

## **The digital divide in Israel**

In Israel, there is a stable digital divide between Jewish and Arab populations with similar incomes, in favor of the former (Schejter, Ben-Harush, & Tirosh, 2018). About one third of the Arab population in Israel is not connected to the Internet, and even in places where there is a connection, the speed and stability of the connectivity are significantly lower (Tahauch, Axelrad, & Matar, 2021).

In addition, although Israel is one of the world's leading countries in Internet connectivity (Sommerlad, & David, 2020) and 78% of its households are online, the picture among the Bedouin population is completely different. Due to the lack of infrastructure, the majority of the Bedouin population uses the cellular network to connect to the Internet: in the recognized Bedouin communities, the share of households connected to the Internet is only 34% (Abu-Kaf, Schejter, & Abu-Jaffar, 2019; Schejter et al, 2023), while the unrecognized localities, which are not connected to basic infrastructures, depend only on the cellular network for their Internet access. But this does not provide relief: in many localities there is no cellular reception at all, and in others, reception is only partial. This is due to the placement of fewer cellular antennas near Bedouin communities relative to the number of existing antennas near Jewish settlements. The ratio of the number of antennas per resident in Jewish localities in the Negev is 1/1217, while in the recognized Bedouin localities it is 1/5783 (Abu-Kaf, Schejter, & Abu-Jaffar, 2019).

## **Distance learning in academia during the pandemic**

During the pandemic, the higher education system has involuntarily moved from in-person to distance learning. Digital learning has created pedagogical, technological, and emotional challenges for faculty and most students, but has been found to have particularly affected students from disadvantaged and marginalized social groups, thereby widening existing social gaps (Browning et al, 2021; Srinivasan, 2021). Students from disadvantaged groups often lack the basic conditions required for digital learning, and the technological, academic, and emotional support they receive from their families and teachers is more limited (European Commission, 2020). As a result, their achievements decrease while their dropout rates increase, in school, thereby paying what Kaupp (2012) describes as an "online penalty".

In Israel, one of the populations most likely to be adversely affected by digital learning is the Bedouin student group. The exact number of Bedouin students attending institutions of higher education in Israel in general and in the Negev in particular, according to various sources is estimated to be between 2,500 and 3,000 (Levy, & Kahn-Strawczynski, 2018; Kadari-Ovadia, 2019). These students

also face difficulties in routine times: a lack of public transportation that enables daily access to institutions of higher education in the cities, which is particularly detrimental to students living in the unrecognized Bedouin communities in the Negev; social and economic difficulties; and lack of encouragement from the local authority (Farah, 2020).

## Method and sample

The study is quantitative and contains findings from an anonymous online questionnaire distributed in April-June 2020, to which 257 Bedouin students studying at various academic institutions in the Negev (N=257) responded.

The questionnaire was distributed via lists containing email addresses of Bedouin students and in WhatsApp groups of Bedouin students. This is a relatively small research population: the estimated total number of Bedouin students who were enrolled to academic institutions in the south of Israel in 2019-2020 was about 2,500-3,000 (Kadari-Ovadia, 2019). Therefore, some of the data was collected using the snowball technique, in which one student passed the questionnaire on to another student (Morgan, 2008). To try and address the shortcomings of the snowball technique and to avoid non-representative sampling, responses received from students who do not live in a Bedouin locality or study in an academic institute in the south of Israel were not included in the sample.

The questionnaire included a request for demographic data and questions regarding the ownership of ICT that enables learning (laptop/desktop, tablet or smartphone), availability of Internet at a level that allows continuous connection (fixed or cellular), and access to additional infrastructure. In addition, the respondents were asked to rank their ability to take part in a preassigned list of distance learning activities and to evaluate their ability to participate in these activities. Closed questions used a Likert scale of 1-5, where 1 indicates absence, disagreement, or low satisfaction and 5 indicates full presence, agreement, or high satisfaction.

For the demographic characteristics emerging from the questionnaire, descriptive statistics were produced using averages, standard deviations, and ranges for the continuous variables, and frequencies for the discrete variables. The differences between the levels of digital divide were assessed using chi-square tests for the discrete variables, and t-tests for unpaired samples for the continuous variables. Significance ( $\alpha$ ) was considered below the value of 5%.

The sample included Bedouin students attending various institutions of higher education in the Negev. Respondents to the questionnaire were mainly women (74%) whose average age was 22.7 years (SD = 4.46). Most respondents live in a recognized locality (75.8%), and the rest (24.2%) live in an

unrecognized locality or in one that is recognized but still without infrastructure. The economic situation of most respondents, according to their definition, is well below the average in the economy (50.8%) or slightly below the average (25%), the rest were around the average (15.6%) and a minority were slightly above the average (6.65%) or well above the average (1.95%).

## Results

As the results indicate that the main barrier the respondents faced was in access to ICT, we chose to focus mainly on this level. The sample subjects were divided into two groups. The variables examined are their ownership of digital devices, the level of Internet accessibility, external barriers affecting access to distance learning, and respondents' ability in terms of physical accessibility, required distance learning activities, and the respondents' level of participation in them.

- Low or non-existent digital divide (n=126): These are respondents who own a suitable end device, have high-quality Internet access, are minimally affected by external barriers, and have the necessary skills to participate in distance learning;
- High digital divide (n=131): These respondents do not own a suitable digital device and/or do not have adequate Internet access, and/or suffer from many external barriers, or do not possess the necessary digital skills.

### *Digital device ownership and Internet access*

Of the total sample, 48.4% of the respondents own a laptop, 7.8% have a desktop PC, and 2.7% have a tablet. 52.8% of the respondents said they use these devices for learning. 81.3% of the respondents have a smartphone, with 64.6% saying it is their primary means of academic studies. This figure can be explained by the fact that there is not always electricity, Internet access or a digital device advanced enough to remotely connect and use for learning purposes.

In total, 35.8% of the respondents have a permanent Internet connection, 43.2% connect to the Internet using a cellular/net stick connection that depends on cellular reception, and 14.4% of the sample did not have any Internet connection. 20% said that their locality has normal reception, 54.5% said that there is occasional cellular reception in their locality, and 25.5% said that there is no cellular reception in their locality at all. Of the respondents who have a regular Internet connection, 19.1% reported that their average Internet speed is 1–5 Mbps, 17.1% reported 5–15 Mbps, 14% reported 15–40 Mbps, and 5.5% surfed at an average speed of 40 Mbps or more. 29.9% responded that they only surf through a cellular network.

### ***Relationship between digital divide and demographic variables***

The degree of differences in demographic variables between respondents with a low digital divide and those with a high digital divide were assessed using chi-square tests for the discrete demographic variables, and t-tests for independent groups for the continuous demographic variables. It was found that most respondents with a low digital divide (85.6%) live in a recognized locality, compared to 66.7% of the respondents with a high digital divide ( $\chi^2(1)=11.90, p<.01$ ). A correlation was also found between digital divide and income level ( $\chi^2(3)=25.9, p<.01$ ) so that there were more respondents with a high digital divide whose income was well below the national average (65.4%) than respondents with a low digital divide (35.7%) (*Table 1*).

*Table 1*

**Difference in digital divide relative to average income**

Income level	Low digital divide n=126	High digital divide n=131
Far below average	45 (35.7%)	85 (65.4%)
Slightly below average	38 (30.1%)	26 (20%)
About average	25 (19.8%)	15 (11.5%)
Above average	18 (14.3%)	4 (3.1%)

\*  $p < .01$

### **Impediments to distance learning**

The staple academic activities of the periods of lockdown were synchronous video lectures using Zoom software (82.5%). Less common, though still common, were recorded lectures (37.7%), e-mail assignments (38.9%) and WhatsApp discussions (25.3%). 62% reported participation in distance learning to a low extent (average=3.11, SD=1.12). Additionally, responders reported various obstructions to their distance learning, commonly a noisy or uncomfortable learning environment (65.6%), technical difficulties (54.1%), and domestic and family commitments (49.2%).

### ***Correlations between digital divide and distance learning***

The differences between low-digital divide and high-digital divide respondents in core variables were assessed using chi-square tests for the discrete core variables, and t-tests for independent samples for the continuous core variables. Respondents with a high digital divide reported more barriers than respondents with a low digital divide (*Table 2*). More respondents with a high digital divide (54.7%) than those with a low digital divide (43.2%) reported not



having sufficient time for learning because of commitments to the home and family ( $2(1)=3.54, p=.01$ ). The results also show that more respondents with a high digital divide (88.5%) than those with a low digital divide (75.4%) were bothered by their ability to participate in studies ( $2(1)=7.56, p<.01$ ). 97% of the respondents with a high digital divide reported that they encountered particular difficulties in distance learning, compared to 82.54% of those with a low digital divide ( $2(1)=14.51, p<0.1$ ). In addition, respondents with a high digital divide (Mean=3.15, SD=1.38) reported a greater chance of dropping out during academic studies, compared to respondents with a lower digital divide (Mean=2.58, SD=1.24), ( $t(255)=3.45, p<.01$ ).

Table 2

**The differences between respondents with a low digital divide and those with a high digital divide with regard to distance learning**

Rate your participation in the following distance learning activities:	Low digital divide n=126	High digital divide n=131
An online Zoom class*	113 (89.7%)	99 (75.6%)
Watching prerecorded classes at home**	52 (41.3%)	45 (34.3%)
Social meetings online***	17 (13.5%)	6 (4.6%)
Submitting class assignments via email****	58 (54%)	42 (32.1%)
Educational discourse on a WhatsApp group	32 (25.4%)	33 (25.2%)
If your ability to participate in distance learning activity is limited, what are the main obstacles?	Low digital divide n=126	High digital divide n=131
Problems with infrastructure***	28 (22.2%)	48 (36.6%)
Technical difficulties*****	60 (47.6%)	79 (60.3%)
Insufficient technical knowledge****	5 (4%)	16 (12.2%)
No time / Home and family commitments*****	54 (43.2%)	72 (55%)
Noise or inadequate learning environment*	77 (61.1%)	102 (77.9%)
To what extent do you participate in studies during this period*	3.51±1.12	2.73±1.17
Do you encounter particular difficulties with distance learning?*	104 (82.5%)	126 (96.9%)
What do you think are the chances that you will drop out of your academic studies?*	2.58±1.24	3.15±1.38

\*p<.01 \*\*p=0.25 \*\*\*p=0.01 \*\*\*\*p=0.02 \*\*\*\*\*p=0.97\*\*\*\*\*p=0.04\*\*\*\*\*p=0.06

## Conclusions

Findings show that most of the examined population of Bedouin students contend with digital inequality to some extent, often manifesting as hindrances to full participation in distance learning. These hindrances obstruct students' chances of achieving academic goals and completing their degrees.

In the short term, these barriers impair the student's ability to complete their academic obligations. In the long run, these gaps may have a broad impact on the students themselves, on their society, and on society in general. These findings are also consistent with studies that have shown that the transition to online learning has a particularly negative impact on the achievements of learners from disadvantaged and marginalized social groups, such as those belonging to a low socioeconomic class or to an ethnic or national minority group, thereby widening the already existing social gaps (Browning et al, 2021).

The fact that these students live in the Negev, an already weakened geographical and digital space, impaired their ability to participate in distance learning and further highlighted the intersectionality between forms of oppression they experience, with one action affecting another, what Crenshaw (2017) calls 'a chain of oppressions'.

Findings also show how these students, who stem from a marginalized population, are subjected to the process described in Van Dijk's (2005) model. They started off at a lower point and therefore could not meet the requirements the academic institutions placed during the transition to distance learning.

The main barrier faced by Bedouin students is the lack of access to learning: only 35.8% of the respondents have a wired Internet connection at home. The remaining majority have to rely on cellular reception. However, 80% of the respondents reported that in their locality, cellular reception is either partial or non-existent. These findings confirm studies on the move to distance learning in Arab and Jewish populations (Katz et al, 2020) and data from the Israeli Ministry of Finance (2020) about disparities between Jewish and Arab students in distance learning. This indicates that reliance on cellular infrastructure does not guarantee continuous high-quality learning. In most cases, students suffering from a high digital divide also faced additional difficulties: a lack of essential infrastructure, a low socioeconomic level, and a lack of an enabling learning environment. These data concur with what is known in the research on the digital divide (Lev-On et al, 2019).

Though many responders attested to using their mobile phones for distance learning, this is an imperfect solution due to its reliance on cellular reception, as well as the fact that much of the content in distance learning is visual

(synchronous writing, presentations, etc.). It is worth noting that the issue of distance learning using only a smartphone has generated some controversy (Dark-Adjei, 2019; Vázquez-Cano, 2014).

A notable finding that reflects the difficulty caused by the transition to distance learning is that over half (55.6%) of the respondents suffering from a high digital divide reported that they are more likely to drop out of their studies than students who do not have such a gap.

The ramifications of the COVID-19 pandemic in general, and of the digital divide in particular, pose great challenges for the Bedouin society. Even in routine times, a digital divide negatively impacts the social mobility afforded by higher education (Kvasny, & Trauth, 2003), and in times of crisis such as the one caused by the pandemic, this concern is significantly reinforced. Without proper investment and addressing the problems of the Bedouin society, unemployment, and poverty are liable to increase, which will lead to a decline in the already low standard of living and to greater exclusion.

Moreover, the dropout rate of over half of Bedouin students is liable to severely harm this population and make it very hard to ameliorate the situation. Today, Internet access is essential in order to be part of society as a citizen, student, employee, entrepreneur, consumer, or in any other position. According to Castells (2002), digital exclusion is one of the most harmful forms of exclusion in contemporary society, because lack of access limits options to accumulate resources and develop abilities (Van Dijk, 2005). The lack of appropriate solutions in this context for the Bedouin population in general and for Bedouin students, in particular, may lead to the formation of a “lost generation” (Klingbail, & Waxman, 2020) that will lead to a further deepening of social and socioeconomic gaps in Israel.

In conclusion, at the theoretical level, this study presents new data and knowledge on a subject not previously studied on the digital divide among Bedouin citizens of the Negev, and particularly among Bedouin students during routine times and during the Covid-19 crisis. Every effort should be made to improve the situation: to exert pressure on decision-makers in the various academic institutions and government authorities to work to improve the state of infrastructure in the Negev and offer appropriate support to the Bedouin student population.

### **Limitations to the study**

The utilization of the snowball technique as one of the data collection methods in this study introduces the possibility of biased and non-representative

sampling, thereby limiting the ability to make generalizations based on the results and conclusions. Furthermore, due to the relatively small sample size and the absence of data pertaining to Bedouin students in the southern region of Israel, there is a clear need for further research to explore the situation and experiences of this particular population during and post the COVID-19 pandemic.

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