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Article

Joining and Gaining Knowledge From Digital Literacy Courses: How Perceptions of Internet and Technology Outweigh Socio-Demographic Factors

Azi Lev-On [1,*], Hama Abu-Kishk [2], and Nili Steinfeld [1]

[1] School of Communication, Ariel University, Israel
[2] School of Communication, Sapir Academic College, Israel

* Corresponding author (azilevon@gmail.com)

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Abstract
Many government-sponsored policies and programs have been implemented in recent years to reduce digital inequality, but research on the effectiveness of such programs is severely lacking. We examine the short-term effects of participation in Lehava, the largest such program in Israel. Participants in our study completed a survey before and after taking introductory computer and internet classes. The findings demonstrate that motivations for participating in the program (measured before taking the course), as well as knowledge gains (i.e., differences between levels of familiarity with concepts before and after taking the course), were predicted almost exclusively by participants' perceptions of technology and the internet, and not by socio-demographic or other variables. We conclude by discussing the *significance of perceptions* over and above socio-demographic considerations for bridging digital inequality gaps.

Keywords
digital divide; digital inequality; digital literacy; Israel; Lehava; media literacy; perceptions about technology; perceptions about the internet

Issue
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1. Literature Review

1.1. Digital Inequality: Background and Significance

Social inequality based on factors such as age, gender, education, socioeconomic status, ethnicity, and religious status has been around since the dawn of history and has implications for access to resources, the ability to use them, and the economic, cultural, social, and political capital of individuals and groups. The massive infiltration of information and communication technologies (ICTs) into many spheres of our lives has illuminated a new phenomenon: *digital inequality* between individuals and groups based on access to technology, capabilities, attitudes towards technology, and usage (Robinson et al., 2015; van Dijk, 2012).

The study of digital inequality is important due to the multitude of contexts in which internet use may benefit users (Scheerder et al., 2017). Research from the past two decades demonstrates that internet use may lead to dramatic results in a variety of contexts, including social and political participation (Kang & Gearhart, 2010), employment (DiMaggio & Bonikowsky, 2008), consumerism (Kaplan & Haenlein, 2010), and many more. Thus, van Dijk (2012) proposes a four-part model of digital inequality: user motivation, material access to technology, user skills, and actual usage (DiMaggio et al., 2004; Helsper, 2012; Scheerder et al., 2017). The lack of accessibility and informed usage capabilities can lead to the exclusion of groups and individuals from key arenas of social discourse and prevent them from accumulating resources and developing capabilities (van Dijk,

2005), resulting in exclusion in many contexts (i.e., multiple deprivations; Castells, 2002).

The study of digital inequality originally focused on internet access and the existence of internet infrastructure, computing equipment, network connection speed, etc. In time, the emphasis shifted from access to variables related to abilities and skills, attitudes, purposes and character of use, and more (Hilbert, 2011; Lev-On & Lissitsa, 2018; Lissitsa & Lev-On, 2014; Livingstone & Helsper, 2007; Steinfeld et al., 2021; van Dijk, 2005, 2006). People's motivation for using technology has become a central element of digital inequality. This motivation depends on personal, psychological, cultural, and social aspects. Personal explanations for low user motivation include fear of technology—feeling discomfort, stress, or anxiety when encountering a computer—alongside personality characteristics such as anxiety or introversion.

Members of social groups vary in their attitudes towards technology according to their place in society. For example, members of vulnerable minorities may develop negative attitudes towards technology as a reflection of a weakened social status. Limited access to technology might lead to anxiety, fear, and distrust in ICTs and, in turn, lead to avoidance. The cultural perspective suggests that employment prestige and attitudes towards ICT will be positively correlated with access and diversity of ICT use. Mesch et al. (2013), for example, found that despite differences in education level and income between Israeli Arabs and Jews, the main inequality in digital access between the groups is linked to changes in employment prestige and attitude toward technology, stemming mainly from a deprived social standing.

1.2. Socio-Demographic and Other Variables Associated With Digital Inequality

This article examines whether socio-demographic or cultural variables influence the motivations to join courses aiming at bridging the digital divide and the knowledge gained from participating in such classes.

Digital inequality research focuses on factors that may explain the differences in internet access and use. Such factors include age, gender, education and socioeconomic status, ethnicity, and religiosity (Scheerder et al., 2017). Below is a brief overview of the studies relating to these variables. Next, we review the socio-demographic and cultural variables known from the literature as having an impact on digital literacy and skills.

One of the most influential predictors of access to and usage of the internet and digital technologies is age. In general, older people are less keen on integrating digital technologies into everyday life (Hargittai & Dobransky, 2017; Hargittai & Hinnant, 2008; Haight et al., 2014). As age increases, the volume of internet use tends to decrease (Helsper et al., 2009).

Early studies have claimed that women use the internet less than men (Ono & Zavodny, 2003), but recent research suggests that in terms of internet access, digital inequality between women and men has disappeared (Blank & Groselj, 2014; Hargittai & Shafer, 2006). Still, digital inequality has not disappeared in reference to usage and technological literacy (Robinson et al., 2015). The main explanation for gender-based digital inequality is typically that men are encouraged more than women from childhood to adopt digital toys and become involved in digital games and classes. This process peaks in adulthood, when eventually men take more technology-oriented positions compared to women (van Dijk, 2012).

Early studies have found that education and socioeconomic status are important predictors of differences in internet access. Over the years, as internet usage has become almost universal, these variables have lost their power in predicting gaps in internet access. However, studies show that they are still important in explaining differences regarding online usage patterns (Witte & Mannon, 2010). Educated people are more likely to use the internet to increase their human capital, resulting in improved employment, financial and health-service options (Hargittai & Hinnant, 2008), compared to less educated people, who do not similarly take advantage of their access and skills to support their educational and economic needs (Helsper & Galacz, 2009).

1.3. Digital Inequality in Israel: Arabs and Ultra-Orthodox Communities

Israeli society is composed of deeply divided enclaves, communities secluded by choice (Douglas, 1985): mainly Arab (e.g., Erdreich, 2016; Lev-On & Lissitsa, 2015) and Haredi (ultra-Orthodox; e.g., Hakak & Rapoport, 2012; Lev-On et al., 2020; Sharabi & Kay, 2021).

While Arab and Jewish populations enjoy roughly the same level of internet accessibility (Ganayem, 2018), the uneven character of the utilization of online tools is evident. For example, whereas as few as 30% of Jews do not take advantage of online opportunities such as shopping and making online payments, such behavior in Arab populations is commonplace, exhibited by more than 70% of internet users. There are diverse origins for such differences in technology use and adoption. Firstly, the commonness of "blue-collar" employment among the Arab population means less exposure to technology. Secondly, the lack of ability, skills, and general exposure in regards to the internet may be the cause of overall negative attitudes and lack of motivation toward technological education among minorities (Mesch & Talmud, 2011).

Another expression of digital inequality is manifest in the patterns of internet usage among the ultra-Orthodox community, a phenomenon which is uniquely Israeli. Ultra-Orthodox communities are self-segregated by choice from the general Israeli society in an attempt to maintain their close communities and unique lifestyle. The internet presents a challenge and an adversary to ultra-Orthodox self-isolation. Internet usage caused a

general outcry among community rabbis during its early years, with them forbidding all contact with the new medium. However, over time, different approaches and compromises have been made, allowing for a lift of internet sanctions and bans under certain circumstances—for employment purposes, for instance (Lev-On et al., 2020).

In any case, the ultra-Orthodox community appears to have increased its internet usage following changes in society, as well as technological and economic developments (Cohen, 2013). Changes in the economic makeup of the ultra-Orthodox community were key factors in their technological evolution. Employment characteristics changed, and more ultra-Orthodox businesses, institutions, and organizations began to depend on the internet for their overall operation (Kahaner et al., 2017). Despite these occupational changes, in 2015–2016, the percentage of ultra-Orthodox Jews who used the internet was equal to only half of the general population: a 43% user rate compared to the 86% non-ultra-Orthodox user rate.

Both minority groups, ultra-Orthodox and Arabs alike, share another interesting similarity in regards to gender roles and the status of women. Both societies hold patriarchal values; however, the practical role of women in their families differs. Despite the inferior position of women in ultra-Orthodox societies in all religious and intellectual aspects, they are often the main providers of the household. This is to allow the men to pursue the full-time study of the Torah and dedicate themselves to the study of religious texts as a "primary vocation" (Stadler, 2009). The higher integration rates of women in the workplace among the ultra-Orthodox results in greater practical and technological knowledge among women as opposed to men, as they receive much higher and more frequent exposure to technology in their fields. The percentage of ultra-Orthodox women receiving training as software programmers and gaining employment in Israel's high-tech industry is on the rise (Lev-On & Neriya-Ben Shahar, 2011; Neriya-Ben Shahar & Lev-On, 2011). Ultra-Orthodox women receive occupational training in computer basics and software programming via the Haredi seminaries and colleges they attend, while Haredi employment centers are populated by young ultra-Orthodox women in gender-segregated working environments (Raz & Tzruya, 2018).

In Arab society, despite a decrease in the digital gap between men and women, the digital space is subject to social and political pressures, and women's use of it is subject to standards set by society. For women, it is important to maintain privacy in the virtual space since they are subject to strict control and supervision from their families and society. Moreover, the supervision of Arab women on the internet is not just a matter of family and society—It is also a matter of power relations (Abu-Kishk, 2020).

The examples above demonstrate that digital inequality is indeed associated with socio-demographic differences. Still, cultural differences are central in shaping perceptions and attitudes, as well as actual use patterns. However, cultural factors related to digital inequality, and their role in affecting technology attitudes and use in comparison to socio-demographic factors, have hardly been studied. Research has rarely attempted to differentiate between sociodemographic and cultural variables in the context of technology use, and certainly not in the context of motivations to join internet and computer literacy courses aiming at filling that gap. This study aims to address this void in the scholarship.

2. Research Environment: The Lehava Program

Reducing digital inequality is a global objective by which organizations hope to empower and promote the social, economic, and political inclusion of disadvantaged populations. In Israel, too, there are several public, private, and third-sector programs aimed at reducing digital inequality. The Lehava program (for reducing the digital divide in Israeli Society) was established in 2001 as the government's flagship program to increase the digital literacy of disadvantaged populations.

The Ministry of Finance established the program in 2001, and the Ministry of Science, Technology, and Space later took over responsibility for it (Fisher & Bandes-Jacob, 2003). The program aimed to benefit citizens with low digital literacy, low socioeconomic status, and limited access to advanced information technologies. The program includes courses and activities which, as of 2018, operate in 30 centers nationwide. Of these, 19 centers are dedicated to the general varied population, while four centers are situated in ultra-Orthodox cities, and seven are situated in Arab cities. The centers operating in minority cities are typically composed of the corresponding minority population. The general population comprised 61% of the 63,000 participants in the various 2016 Lehava activities, while the participants of the ultra-Orthodox centers comprised 22% and the Arab centers 17%. Foundational introductory computer and internet classes in 2016 were taken by about half of all program participants (Ministry of Science, Technology and Space, 2017). The course is spread over 18 1.5-hour sessions and covers issues such as familiarity with the computer, keyboard, and mouse, smart and secure web browsing, searching for information online, personal information management, using email, Israeli e-government websites, and social media. The common denominator, across centers and populations, was the majority of participants being women.

Two previous studies have assessed the impact of Lehava (Fisher & Bandes-Jacob, 2003; Zilka, 2012). Both studies used questionnaires measuring participants' internet skills and information about and attitudes towards the internet. Pre- and post-course questionnaires were completed, and interviews were conducted with participants and instructors. In Fisher and Bandes-Jacob's (2003) study, half of the participants who came to the centers mainly to improve their online

skills and become familiar with computers for personal needs significantly improved their skills (according to self-reports). Zilka (2012) found that 40% felt they improved their skills, while 85% reported greater confidence in working with computers. Still, these and other studies did not compare social-economic and cultural variables as predictors of joining computer and internet literacy classes. They also did not compare these variables as predictors of differences in knowledge gained from these classes in order to understand the role of social-economic and cultural variables in the study of digital inequalities and literacy. As such, this is the key contribution of the current study.

3. Research Questions

Based on these previous studies, our research questions are the following:

- What predicts motivations to join computer and internet literacy classes?
- What predicts the differences in knowledge gained from these classes?

Following the literature review and to contribute to the research gap in distinguishing between sociodemographic and cultural variables, we examine whether the questions above are a function of sociodemographic variables or of cultural factors manifested in attitudes and perceptions.

4. Method

4.1. Pre-Course Data Collection

The research planning and data collection were carried out in close cooperation with the Ministry of Science and Technology and with Lehava center managers. We received a list of Lehava centers and their managers from the Ministry of Science, Technology, and Space, which oversees the program. This was done in order to collect data about participants in the introductory computer and internet classes

Data were collected from the introductory computer and internet classes since they are the most elementary, fundamental, and popular of all Lehava classes. As stated, there are 30 Lehava centers across Israel, mainly in the geographic periphery, but not all of them had introductory classes during the data collection period. Ultimately, data was collected from 12 Lehava centers in which such classes were opened during the data collection period and while maintaining geographic representation, of which seven are centers for the Jewish population (including the ultra-Orthodox) and five for the Arab population.

We decided to arrive in person at the centers and distribute the paper questionnaires by researchers who speak Hebrew and Arabic as a first language, according to the population attending the center. The decision to distribute the questionnaires in person was made after the researchers realized that the presence of members of the research team was needed to ensure that participants actually completed the surveys. These required some 20 minutes and could often be quite challenging for participants to finish in an online format. Many of the participants were older people with low digital literacy and fairly poor technical orientation, some lacking basic computer skills. Hence, it was decided that the questionnaires would be distributed on paper and not in a digital format.

4.2. Post-Course Data Collection

To examine the short-term impact of participation in the course, members of the research team returned to the centers at the end of the course to collect data once again.

Of the 179 participants who completed the pre-course questionnaire, 70 participants completed the corresponding post-course questionnaire. Among those who completed both questionnaires, 39 belonged to the Arab population, 23 to the general Jewish population, and eight to the ultra-Orthodox community. Note that both pre- and post-class data collection was finalized shortly before the outbreak of Covid-19.

4.3. Research Tool

In addition to the theoretical background, some variables known in the literature to impact digital inequalities have been identified. The questionnaires contained questions about the topics below.

The motivations for joining the course (self-development) were measured using a scale of 1 (*not at all*) to 7 (*to a great extent*). Motivations included improving computer literacy, familiarity with new technologies, learning how to use different computer programs, improving the ability to use the internet, social connections, entertainment, and leisure. These motivations were identified in a pilot study (see Lev-On et al., 2020).

The variable Perceptions of Technology (Blank & Reisdorf, 2012) was composed of the following statements: "It is easy for me to do things without technology"; "with technology I can do things much better"; "I do not believe in technology"; "technology makes me nervous"; "it's very hard for me to catch up on technology"; and "I'm very open to new technologies." The options ranged from 1 (*sympathy for technology*) to 5 (*hostility towards technology*).

The variable Perceptions of the Internet (Tsai et al., 2001) was composed of the following statements: "I get bored with using the internet"; "I am afraid to use the internet in case I look stupid"; "when I use the internet I am afraid I am going to do some damage"; "the internet makes me feel uncomfortable"; and "when I use the internet, I am not sure what I am doing." The options

ranged from 1 (*liking the internet*) to 5 (*reluctance to use the internet*).

The variable Activities on the Internet (an updated version of Hargittai, 2004) was composed of 20 statements relating to internet activities, such as searching for information, paying bills, investing in stocks, viewing photos, and using social media. Each option had a scale ranging between 1 (*never use*) and 6 (*use multiple times a day*).

The variable Familiarity With Concepts About Computers and the Internet (an updated version of Hargittai, 2005) was composed of statements about the levels of familiarity with nine concepts, such as favorites, blogs, PDFs, etc. Each concept was introduced on a scale between 1 (*I do not know the concept*) and 5 (*I am very familiar with the concept*).

The variable Self-Efficacy in Computer Usage (Compeau & Higgins, 1995) was composed of five statements about one's perceived ability to use the computer to perform tasks. Each option was introduced on a scale between 1 (*total lack of confidence*) and 10 (*great deal of confidence*).

The variable Self-Efficacy in Internet Usage (Wu & Tsai, 2011) was composed of 20 statements about participants' sense of confidence in their ability to perform certain actions on the internet, such as downloading images, printing content, searching for information, etc. Each option was presented on a scale between 1 (*total lack of confidence*) and 7 (*a great deal of confidence*).

Questions About Locus of Control (Valecha & Ostrom, 1974) concerns a sense of control over life, believing that luck, the environment, or some external factors control one's life, versus believing that one controls events in their life. The variable was introduced to our research since studies demonstrated associations between locus of control and computer literacy (Kay, 1990; Wingreen & Blanton, 2001). Research explains this connection by suggesting that users who have a high degree of computer literacy feel that they have more control over computers (computer locus of control). With the increasing centrality of the internet in various aspects of life, it is suggested that a high degree of internet literacy is associated with a higher degree of general locus of control, as users believe that by successfully using the internet, they have greater control over events in their life. In the questionnaire, each option was on a scale between 1 (*very little*) and 7 (*to a very large extent*). The original variable consisted of five statements, but the fourth statement ("what happens to me has nothing to do with my actions") decreased the reliability of the variable and was removed.

We also asked about participants' gender, age, family status, native language, country of origin, occupation, income level, education level, area of residence, and religious affiliation.

The questionnaire was translated from English into both Hebrew and Arabic. The questionnaire in Hebrew was disseminated at the centers intended for the Jewish population, while the questionnaire in Arabic was disseminated at the centers serving Arabic speakers.

5. Findings

5.1. Descriptive Findings

Pre-course data were collected from 179 participants: 76 participants took the classes in centers for the general Jewish population, 25 in centers for the ultra-Orthodox Jews, and 78 in centers for Arabs.

More than 80% of the participants were women, among both the Jewish and Arab populations. Participants' age ranged between 20 and 70, with the average age of participants among the Jewish population about 50, compared to about 40 among the Arab population. Just under half of the respondents (45%) reported they are unemployed, in addition to 19% who were retired. Most respondents (79%) stated that their income was lower-than-average. The average number of years of education was slightly lower than 12. Over half of respondents reported using the internet at least once a day before classes started.

The main motivations for joining the course were familiarity with new technologies (62%), improving computer literacy (62%), learning how to use computer programs (61%), and improving the ability to use the internet (59%)—i.e., cognitive motivations related to knowledge about technology, computers, and the internet.

Below in Table 1, we present the statistical details of the independent study variables (taken from the pre-course measurement).

The study population perceived both technology and the internet as challenging. Regarding Perceptions of Technology, on a scale of 1 (*sympathy for technology*) and 5 (*hostility towards technology*), responses averaged 3.03. Regarding Perceptions of the Internet, on a scale of 1 (*liking the internet*) and 5 (*hostility towards the internet*), respondents were on the liking side with an average of 2.27. In general, participants seemed to shy away from technology more than from the internet. The prevalent activities participants performed on the internet were searching for news from Israel and from around the world, and information on health, weather, and self-help (average = 2.7, SD = 1.2, α = 0.94). The values of the other independent variables appear in the table.

5.2. Predicting the Motivations to Join the Classes

Next, to answer the research questions, we performed four logistic regressions to predict the main motivations for joining the courses: familiarity with new technologies, improving computer literacy, learning how to use computer programs, and improving the ability to use the internet. For the logistic regressions, the various motivations for joining the course were recoded as dichotomous variables (1–4 were coded as

Table 1. Statistical details of independent study variables.

Independent variable	Statistical details
Perceptions of Technology	mean = 3.03 (scale of 1 to 5), *SD* = 0.86, α = 0.67
Perceptions of the Internet	mean = 2.27 (scale of 1 to 5), *SD* = 1.04, α = 0.78
Familiarity With Concepts for Computer and Internet	mean = 1.99 (scale of 1 to 5), *SD* = 1.22, α = 0.93
Self-Efficacy in Computer Usage	mean = 4.87 (scale of 1 to 10), *SD* = 2.63, α = 0.91
Self-Efficacy in Internet Usage	mean = 3.68 (scale of 1 to 7), *SD* = 1.94, α = 0.94
Locus of Control	mean = 4.53 (scale of 1 to 7), *SD* = 1.37, α = 0.66).

lack of motivation, 5–7 were coded as existence of motivation) due to the uneven distribution of answers. All the regressions examined the impact of Locus of Control, Internet Activities, Perceptions of Technology, Perceptions of the Internet, Self-Efficacy in Computer Usage, and demographic variables—age, gender, education, income, and religious affiliation (ultra-Orthodox or not)—on the dependent variables.

5.2.1. Predicting the Motivation to Join the Course to Become Familiar With New Technologies

A logistic regression was performed to examine the impact of the independent variables on the motivation to join the course to become familiar with new technologies and was found to be statistically significant ($\chi^2(1) = 14.83$, $p < 0.001$). The model predicted 47% (Nagelkerke R^2) of the variance of the motivation to join the course to become familiar with new technologies (see Table 2).

The findings demonstrate that Perceptions of the Internet can increase the chances of joining the course based on the motivation to become familiar with new technologies 0.157 times. The other independent variables had no significant effect on the dependent variable.

5.2.2. Predicting the Motivation to Join the Course to Improve Computer Literacy

A logistic regression was performed to examine the impact of the independent variables on joining the course based on the motivation of improving computer literacy. The model was statistically significant ($\chi^2(2) = 11.510$, $p < 0.001$). The model predicted 43.2% (Nagelkerke R^2) of the variance of the motivation to join the course for improving computer literacy (see Table 3).

The findings show that perceptions of computers can increase the chances of joining the course for improving computer literacy 24.079 times, and Perceptions of the Internet can increase it 0.039 times. The other independent variables had no significant effect on the dependent variable.

5.2.3. Predicting the Motivation to Join the Course to Learn How to Use Computer Programs

A logistic regression was performed to examine the impact of the independent variables on joining the course based on the motivation to learn to use computer software. The model was statistically significant ($\chi^2(1) = 6.022$, $p < 0.05$) and predicted 20.3% (Nagelkerke R^2) of the variance of the motivation to join the course to learn how to use computer programs (see Table 4).

The findings demonstrate that Perceptions of the Internet can increase the chances of joining the course for learning to use computer programs 0.37 times. The other independent variables had no significant effect on the dependent variable.

5.2.4. Predicting the Motivation to Join the Course to Improve the Ability to Use the Internet

A logistic regression was performed to examine the impact of the independent variables on joining the course to improve the ability to use the internet.

Table 2. Logistic regression results for predicting the motivation to join the course to become familiar with new technologies.

Independent variable	*B*	*SE*	Wald	Exp(B)
Perceptions of the Internet	−1.854	0.6320	8.595**	0.157

Note: * $p < 0.05$, ** $p < 0.01$.

Table 3. Logistic regression results for predicting the motivation to join the course for improving computer literacy.

Independent variable	*B*	*SE*	Wald	Exp(B)
Perceptions of Technology	3.181	1.628	3.817*	24.076
Perceptions of the Internet	−3.241	1.411	5.274*	0.0390

Note: * $p < 0.05$.

Table 4. Logistic regression results for predicting the motivation to join the course to learn how to use computer programs.

Independent variable	*B*	*SE*	Wald	Exp(B)
Perceptions of the Internet	−0.995	1.525	12.628*	0.370

Note: * $p < 0.05$.

The model was statistically significant ($\chi^2(2) = 18.545$, $p < 0.001$) and predicted 41.6% (Nagelkerke R^2) of the variance of the motivation to join the course to improve the ability to use the internet (see Table 5).

The findings demonstrate that Perceptions of the Internet can increase the chances of joining the course to improve the ability to use the internet 3.64 times, and Activities on the Internet could increase the chances 0.469 times. The other independent variables had no significant effect on the dependent variable.

5.3. Predicting the Differences Between Familiarity With Concepts Before and After the Courses

To predict the differences between Familiarity With Concepts About Computers and the Internet, a multiple linear regression analysis was conducted in steps. The variables entered into the regression model are Locus of Control, Internet Activities, Perceptions of Technology and of the Internet, and demographic variables—gender, age, income, education, and religious affiliation (ultra-Orthodox or not).

We found that differences between familiarity with the concepts can be explained by Perceptions of Technology, followed by Locus of Control ($F_{(2,21)} = 7.598$, $p < 0.01$). The predictive variables explain 36.5% of the variance of the variable differences between Familiarity With Concepts. The other variables had no significant effect on the dependent variable (see Table 6).

6. Discussion and Conclusions

Activities in many spheres of our lives have migrated to the internet. Digital inequalities, such as differences in internet access, capabilities, attitudes, and type of usage, affect the ability of individuals and groups to perform daily tasks online quickly and efficiently and get the most out of it to suit their needs.

Digital inequality and the factors that predict it are the subjects of much research, but research that deals with the effectiveness of programs to reduce it is almost non-existent. The current study contributes to filling the research gap in the field of evaluating programs to reduce digital inequality, focusing on socio-economic vs. cultural variables through a study of Lehava, the most extensive program in Israel dedicated to this aim. Data was collected in the introductory computer and internet classes, attended by about half of all project participants.

Examination of the variables that predict the motivation to *join a course* demonstrates the centrality of cultural variables, notably perceptions *regarding the internet* that the participants had at the beginning of class. Such perceptions do not develop during the course but largely come from the social and cultural contexts of the learners' environment prior to taking the course. Arguably, vulnerable minorities might have negative attitudes towards technology as a reflection of a weakened social status, which may be the cause for these perceptions. Such trajectories, however, require further study to substantiate.

The main *motivations* for joining the course were familiarity with new technologies, improving computer literacy, learning how to use different computer programs, and improving the ability to use the internet. All are cognitive motivations related to knowledge about technology, computers, and the internet.

This study adds to our knowledge in the field of digital inequalities and digital literacy by demonstrating that perceptions regarding the internet were the only predictor of all the motivations for joining the program. Our finding indicates the importance of perceptions regarding the internet in the context of the courses. Knowledge

Table 5. Logistic regression results for predicting the motivation to join the course to improve the ability to use the internet.

Independent variable	*B*	*SE*	Wald	Exp(B)
Perceptions of the Internet	1.292	0.571	5.110*	3.640
Activities on the Internet	−0.757	0.3950	3.674*	0.469

Note: * $p < 0.05$.

Table 6. Multiple regression in steps to predict differences in Familiarity With Concepts About Computers and the Internet.

Independent variable	*B*	*SE*	*β*	R^2
Perceptions of Technology	1.258	0.367	0.591**	0.247
Locus of Control	−0.637	0.283	−0.379*	0.365

Note: * $p < 0.05$, ** $p < 0.01$.

gains (differences between levels of familiarity with concepts after and before the class) were also predicted mainly by participants' perceptions of technology and the internet. The findings demonstrate that cultural factors are central in studying motivations to join computer and internet literacy programs and the gains from them. Note the lack of predictive power of gender.

The results of this study contribute to our understanding of digital inequality and the programs aiming at reducing it. Such understating can inform the design and content of future computer and internet literacy programs and the character of their publication and participant recruitment, which should probably focus more on cultural rather than socio-economic factors.

The study demonstrates that although socio-demographic variables receive the most scholarly attention, it is rather the cultural aspects—attitudes, perceptions, and views of technology—that are most influential in predicting motivation as well as actual learning and success in the course.

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Conflict of Interests

The authors declare no conflict of interests.

References

Abu-Kishk, H. (2020). *Yelidim Digitalim Vemehagrim Digitalim Bahevra Haaravit* [Digital natives and digital immigrants in the Arab society]. Israel Internet Association.

Blank, G., & Groselj, D. (2014). Dimensions of internet use: Amount, variety, and types. *Information, Communication & Society*, *17*(4), 417–435.

Blank, G., & Reisdorf, B. C. (2012). The participatory web: A user perspective on web 2.0. *Information, Communication, and Society*, *15*(4), 537–554.

Castells, M. (2002). *The internet galaxy: Reflections on the internet, business, and society*. Oxford University Press.

Cohen, Y. (2013). The age of information and the religious ultra-Orthodox identity. *Kesher*, *44*, 3–9.

Compeau, D. R., & Higgins, C. A. (1995). Computer self-efficacy: Development of a measure and initial test. *MIS Quarterly*, *19*(2), 189–211.

DiMaggio, P., & Bonikowsky, B. (2008). Make money surfing the web? The impact of internet use on the earnings of US worker. *American Sociological Review*, *73*, 227–250.

DiMaggio, P., Hargittai, E., Celeste, C., & Shafer, S. (2004). Digital inequality: From unequal access to differentiated use. In K. Neckerman (Ed.), *Social inequality* (pp. 355–400). Russell Sage Foundation.

Douglas, M. (1985). *Risk acceptability according to the social sciences*. Russell Sage Foundation.

Erdreich, L. (2016). The paths of "return": Palestinian Israeli women negotiate family and career after the university. *International Journal of Educational Research*, *76*, 120–128.

Fisher, Y., & Bandes-Jacob, A. (2003). *Tsimtsum Happar Hadigitali BeIsrael- Proyect Lehava* [Lehava: Reducing the digital gap in Israel]. Henrietta Szold Institute.

Ganayem, A. (2018). *HaInternet Bahevra Haaravit BeIsrael: Tmunat Matsav [The state of the internet in the Arab society in Israel]*. Israeli Internet Association. https://www.isoc.org.il/wp-content/uploads/2018/12/isoc-il-asma-ganaim.pdf

Haight, M., Quan-Haase, A., & Corbett, B. A. (2014). Revisiting the digital divide in Canada: The impact of demographic factors on access to the internet, level of online activity, and social networking site usage. *Information, Communication & Society*, *17*(4), 503–519.

Hakak, Y., & Rapoport, T. (2012). Excellence or equality in the name of God? The case of ultra-Orthodox enclave education in Israel. *The Journal of Religion*, *92*(2), 251–276.

Hargittai, E. (2004). Classifying and coding online actions. *Social Science Computer Review*, *22*(2), 210–227.

Hargittai, E. (2005). Survey measures of web-oriented digital literacy. *Social Science Computer Review*, *23*(3), 371–379.

Hargittai, E., & Dobransky, K. (2017). Old dogs, new clicks: Digital inequality in internet skills and uses among older adults. *Canadian Journal of Communication*, *42*, 195–222.

Hargittai, E., & Hinnant, A. (2008). Digital inequality: Differences in young adults' use of the internet. *Communication Research*, *35*(5), 602–621.

Hargittai, E., & Shafer, S. (2006). Differences in actual and perceived online skills: The role of gender. *Social Science Quarterly*, *87*(2), 432–448.

Helsper, E. J. (2012). A corresponding fields model for the links between social and digital exclusion. *Communication Theory*, *22*(4), 403–426.

Helsper, E. J., Dutton, W. H., & Gerber, M. M. (2009). *To be a network society: A cross-national perspective on the internet in Britain* (Research Report No. 17). Oxford Internet Institute.

Helsper, E. J., & Galacz, A. (2009). Understanding the links between social and digital inclusion in Europe. In G. Cardoso, C. A. Heong, & J. Cole (Eds.), *The worldwide internet: Changing societies, economies and cultures* (pp. 146–178). University of Macau Press.

Hilbert, M. (2011). The end justifies the definition: The manifold outlooks on the digital divide and their practical usefulness for policy-making. *Telecommunications Policy*, *35*(8), 715–736.

Kahaner, L., Malach, G., & Hoshen, M. (2017). *Shnaton hahevra Haheredit BeIsrael* [Yearbook of ultra-Orthodox society in Israel]. The Israel Democracy Institute.

Kang, S., & Gearhart, S. (2010). E-Government and civic engagement: How is citizens' use of city websites related with civic involvement and political behaviors? *Journal of Broadcasting and Electronic Media*, *54*(3), 443–462.

Kaplan, A. M., & Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of social media. *Business Horizon*, *53*(1), 59–68.

Kay, R. H. (1990). The relation between locus of control and computer literacy. *Journal of Research on Computing in Education*, *22*(4), 464–474.

Lev-On, A., & Lissitsa, S. (2015). Studying the coevolution of social distances, offline- and online contacts. *Computers in Human Behavior*, *48*, 448–456.

Lev-On, A., & Lissitsa, S. (2018). Facilitating cross-cleavage communication online: Findings from interviews with ultra-Orthodox, religious and secular participants. *Communication Review*, *21*(3), 212–227.

Lev-On, A., & Neriya-Ben Shahar, R. (2011). A forum of their own: Views about the internet among ultra-Orthodox Jewish women who browse designated closed forums. *First Monday*, *16*(4). https://firstmonday.org/ojs/index.php/fm/article/view/3228/2859

Lev-On, A., Steinfeld, N., Abu-Kishk, H., & Naim, S. P. (2020). The long-term effects of digital literacy programs for disadvantaged populations: Analyzing participants' perceptions. *Journal of Information, Communication and Ethics in Society*, *19*(1), 146–162.

Lissitsa, S., & Lev-On, A. (2014). Gaps close, gaps open: A repeated cross-sectional study of the scope and determinants of the ethnic digital divide. *International Journal of Electronic Governance*, *7*(1), 56–71.

Livingstone, S., & Helsper, E. (2007). Gradations in digital inclusion: Children, young people and the digital divide. *New Media & Society*, *9*, 671–696.

Mesch, G., & Talmud, I. (2011). Ethnic differences in internet access: The role of occupation and exposure. *Information, Communication & Society*, *14*(4), 445–471.

Mesch, G., Talmud, I., & Kolobov, T. (2013). Explaining digital inequalities in Israel: Juxtaposing the conflict and cultural perspectives. In M. Ragnedda & G. Muschert (Eds.), *The digital divide: The internet and social inequality in international perspective* (pp. 220–234). Routledge.

Ministry of Science, Technology and Space. (2017). *Sikum Peilut Hamisrad: Doch Bitsua* [Annual report about the Ministry's activities]. Jerusalem: Old City Press.

Neriya-Ben Shahar, R., & Lev-On, A. (2011). Gender, religion, and new media: Attitudes and behaviors related to the internet among ultra-Orthodox women employed in computerized environments. *International Journal of Communication*, *5*, 875–895.

Ono, H., & Zavodny, M. (2003). Gender and the internet. *Social Science Quarterly*, *84*(1), 111–121.

Raz, A. E., & Tzruya, G. (2018). Doing gender in segregated and assimilative organizations: Ultra-Orthodox Jewish women in the Israeli high-tech labour market. *Gender, Work & Organization*, *25*(4), 361–378.

Robinson, L., Cotten, S. R., Ono, H., Quan-Haase, A., Mesch, G., Chen, W., Schulz, J., Hale, T. M., & Stern, M. J. (2015). Digital inequalities and why they matter. *Information, Communication & Society*, *18*(5), 569–582.

Scheerder, A., van Deursen, A., & van Dijk, J. (2017). Determinants of internet skills, uses and outcomes: A systematic review of the second-and third-level digital divide. *Telematics and Informatics*, *34*(8), 1607–1624.

Sharabi, M., & Kay, A. (2021). The relative centrality of life domains among secular, traditionalist and ultra-Orthodox (Haredi) men in Israel. *Community, Work & Family*, *24*(1), 60–76.

Stadler, N. (2009). *Yeshiva fundamentalism: Piety, gender, and resistance in the ultra-Orthodox world*. NYU Press.

Steinfeld, N., Lev-On, A., & Abu-Kishk, H. (2021). Measuring digital literacy with eye tracking: An examination of skills and performance based on user gaze. In *WebSci' 21: 13th ACM Web Science Conference 2021* (pp. 21–28). Association for Computing Machinery.

Tsai, C.-C., Lin, S. J., & Tsai, M.-J. (2001). Developing an internet attitude scale for high school students. *Computers & Education*, *37*, 41–51.

Valecha, G. K., & Ostrom, T. M. (1974). An abbreviated measure of internal-external locus of control. *Journal of Personality Assessment*, *38*(4), 369–376.

van Dijk, J. A. (2005). *The network society: Social aspects of the new media*. SAGE.

van Dijk, J. A. (2006). Digital divide research, achievements and shortcomings. *Poetics*, *34*(4/5), 221–235.

van Dijk, J. A. (2012). The evolution of the digital divide: The digital divide turns to inequality of skills and usage. In: J. Bus, M. Crompton, M. Hildebrandt, & G. Metakides (Eds.), *Digital enlightenment yearbook 2012* (pp. 57–75). IOS Press.

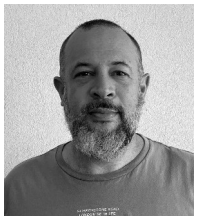
Wingreen, S., & Blanton, J. E. (2001). Locus of control: A framework for use in the field of information systems. In *Americas Conference on Information Systems 2001 Proceedings* (pp. 1939–1946). Association for Information Systems.

Witte, J., & Mannon, S. (2010). *The internet and social inequalities*. Routledge.

Wu, C. S. H., & Tsai, C. C. (2011). Nurses' internet self-efficacy and attitudes toward web-based continuing learning. *Nurse Education Today*, *31*(8), 768–773.

Zilka, G. (2012). Tsimtsum Happar Hadigitali Bekerev Ochlisiyot Muchlashot BeIsrael [Reducing the digital gap among underserved populations in Israel]. *Horaa Velemida Beidan HaInternet*, *14*, 101–138.

About the Authors



Azi Lev-On (PhD) is the head of the institute for the study of new media, politics, and society in the School of Communication at Ariel University. His research focuses on the social and political uses and impact of the internet and social media, particularly on their affordances for and usage by citizens in terms of speech and action and the corresponding institutional responses.

Hama Abu-Kishk (PhD) is a senior lecturer in the Department of Communications at Sapir Academic College and a researcher at Ben Gurion University of the Negev. Her research interests include digital inequalities, new media among the Arab society in Israel, digital activism, and distance learning.

Nili Steinfeld (PhD) is the head of the digital communications track at the School of Communications, Ariel University. She studies the political and social implications of digital media, privacy and surveillance online, social networks as public spheres, citizens–politicians online engagement, virtual intergroup contact, and online political discourse. She employs innovative technology and digital and virtual reality methods in her research and combines various methodological approaches, among them online experiments, surveys, eye tracking, and digital methods.