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Teaching Digital Literacy for Children and Adults

Abstract

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Background

Digital literacy is defined as the skills, proficiency and knowledge required for functioning well in the digital environment in the 21st century and is recognized as essential in our time. In an era of a unique and rapid technological revolution, digitally literate workers are expected to have a significant advantage in the labor market.

In 2015, Israel had the widest digital gap among participating OECD countries in the problem-solving in technology-rich environments test1, taken as part of the PIAAC[2] skills survey. The digital gap is prevalent among the Arab-Israeli and the ultra-Orthodox populations. Digital skills and technological understanding can, and should, be taught to children and youth during their time in the education system, before they enter the labor market. This preparedness will enable students, throughout their adult lives, to continue to upgrade their digital literacy. Working-age adults also need to acquire digital literacy and this necessity is especially pressing for employees in jobs that will likely be automated in the near future. Assistance in improving their digital literacy may enable these workers, many of whom are low-skilled and earn low wages, to remain in the workforce.

1 This refers to the gap in Israel between the scores of the 95th percentile and the 5th percentile on the test. The digital gap is also expressed in the inequality between groups based on accessibility to technology, ability to use it, opinions regarding it and the range of uses of it

2 PIAAC (the Program for the International Assessment of Adult Competencies) is a program of assessment and analysis of adult (ages 16 through 65) skills. The PIAAC Survey of Adult Skills - conducted on behalf of the OECD (Organisation for Economic Co-operation and Development) - measures adults' proficiency in key information-processing skills - literacy, numeracy and problem solving in technology-rich environments - and gathers information and data on how adults use their skills at home, at work and in the wider community. It examines, inter alia, the individual's ability to use digital technology, the level of their technological proficiency and its alignment with labor market needs. The first cycle of the PIAAC survey was conducted in three rounds—in 2001–2012, 2014–2015, and 2017. Israel participated in the second round, between April 2014 and January 2015, and is scheduled to participate in the second cycle of survey that will be conducted in 2022–2023.

Key facts

24th

Israel's ranking - out of 33 participating countries[3] - in the PIAAC problem solving in technology-rich environments test, for youth aged 16–19

73%

Percentage of the adult population in Israel (ages 16–65) with low levels of digital literacy according to the PIAAC survey - similar to a 70% average in participating OECD countries

1 of 10

Individuals aged 20–74 in Israel did not use the internet in 2019 - approx. 560,000 people

4%, 19%

Percentage of the Arab-Israeli and ultra-Orthodox adult populations (ages 16–65), respectively, with high levels of digital literacy (according to the PIAAC survey) vs. 37% in the Jewish non-ultra-Orthodox population and about 30% on average in participating OECD countries

36%

Of the schools in the Israeli education system participated in 2018 in a program for supplying computing equipment to schools (1,808 of about 5,000 schools); 1% of the schools that participated are ultra-Orthodox schools

40%

The percentage of teachers who noted in a 2016–2017 survey that they had not participated in training for teaching in a digital environment

50%

The percentage of students in grades 5–11 who used a computer to study and take exams during academic years 2015–2019

1%

The percentage of participants in a government-sponsored guided program for developing digital literacy in 2019, of the approx. 3.7 million working-age individuals (18–64) in Israel with low levels of digital literacy

Audit actions

From September 2019 to May 2020, the Office of the State Comptroller examined the actions of the State authorities to promote digital literacy among children and youth, and among working-age adults in general, and specifically among the ultra-Orthodox and Arab-Israeli populations. The audit was conducted in the following government units and ministries: the Ministry of Education; the Headquarters for the National Digital Israel Initiative; the Labor Branch of the Ministry of Labor, Social Affairs and Social Services; the Ministry of Science and Technology; and the Israeli Employment Service.

3 This refers to the 33 countries that participated in the first cycle of the survey between 2011–2017.

Key findings

- **National tests to measure the level of digital skills among students:** Although the Ministry of Education attempts to assess the extent of use of digital means in various ways, it does not measure the level of digital skills of the majority of students at any school grade. Consequently, it does not have the information regarding the level of digital skills of students in the education system - data it requires as a basis for formulating policy in general, and regarding the need reduce gaps specifically.

- **Teaching digital skills to students:** During the academic years 2014–2017, only about half of the students in elementary (primary) school, and a minority (23%-30%) of students in secondary school were taught internet literacy. About 50% of students in the various age levels used computers for study and exam purposes throughout the academic years 2015–2019.

- **The digital gap in the Jewish ultra-Orthodox and Arab sectors:** A significant percentage of Israeli students, particularly in the Jewish ultra-Orthodox and Arab sectors, do not acquire, as part of their studies, the digital skills essential for integrating successfully in the changing labor market. For example, the percentage of Arabic speakers who use computers for study purposes decreases from grade 7 onwards, becoming lower than that among Hebrew speakers—by grade 11, the gap reaches 21% regarding searching information on the internet and 13% regarding information processing and presenting using the computer. In ultra-Orthodox schools, the percentage of computerized classrooms out of all classrooms, is the lowest among all sectors—about 2%.

- **Imparting digital skills to teachers:** The level of teachers' digital skills is not optimal as is their training in this area. Only 52% of teachers who participated in the TALIS 2018[4] survey reported that they had the sense of capability to assist students in learning using digital technology, versus the OECD average of 67%.

- **Monitoring and control of the use of digital educational content by students and teachers:** The Ministry of Education does not monitor and control the use students and teachers make of digital educational content in a way that will allow it to examine the effectiveness of this use.

- **Computational thinking[5]:** The actions of the Ministry of Education did not lead to teaching computational thinking among significant parts of the education system (e.g., it did not appear in 91% of content items in the 12 study subjects that were examined in the mapping conducted by the Ministry of Education according to

4 TALIS – the OECD Teaching and Learning International Survey - examines issues related to teacher's work and the school learning environment. In Israel, teachers and students in grades 7–9 (lower secondary schools) participated in the survey.

5 Computational thinking is a problem-solving process that includes the ability to design solutions that can be executed by humans or computers or a combination of the two.

OECD instructions). Israel is still in the initial stage of integrating computational thinking into the curricula.

- **The scope of Government activity to teach digital literacy to adults:** Only 1% of working-age adults (18–64) whose levels of digital literacy were low participated in 2019 in a government-sponsored program (with guidance) for developing digital literacy. Despite a Government decision of June 2017[6] regarding joint action by various ministries, it was found that each ministry considered itself to be a leader in this area and that, in practice, no entity or team is responsible for coordinating issues such as target populations and scope of participants. Moreover, given the fact that each year, the working-age population grows, if the number of participants in digital literacy programs remains unchanged, the share of individuals with low levels of digital literacy who participate in programs, might decrease.

- **Imparting digital literacy to adults from the Arab and ultra-Orthodox populations:** In the Arab-Israeli population there were about 1,029,000 working-age adults (18–64) with low levels of digital literacy, but only 13,700 Arab-Israeli participated in a government-sponsored program (with guidance) for developing digital literacy (about 1.3%) in 2019; among the ultra-Orthodox population, there were about 360,000 with low levels of digital literacy, and about 13,100 who participated in a digital literacy program (about 3.6%). The limited participation of these population groups, who are characterized by low levels of digital literacy, and generally having limited means, raises the concern that they will experience difficulties in attempting to reduce the existing digital gap on their own, which may have implications on their ability to improve their economic situation and find a stable job.

Providing digital skills to teachers: Israel is ranked just above the OECD average in regard to the percentage of teachers who indicated that they received digital skills training for teaching needs – 58% vs. 56%, respectively.

Activity during the COVID - 19 pandemic: During the economic and employment crisis stemming from the pandemic, various government entities worked to promote digital literacy: The Ministry of Education worked to equip schools with computer infrastructures and provide teachers with digital skills. For example, during August 2020, the Ministry of Education trained about 70,000 teachers at centers for teaching staff development as well as through short digital courses; the Labor Branch, the Employment Service and the Digital Israel Initiative increased the use of online means and adapted their activities to teach digital literacy to adults.

6 Government decision 2733 (11 June 2017) related to the Ministry of Social Equality, to which at that time Digital Israel Initiative was subordinate. At the end of the audit, Digital Israel Initiative was transferred to the Ministry of Cyber and Digital Matters.

Key recommendations

- **Teaching digital skills to students:** It is recommended that the Ministry of Education examine ways to expand the integration of digital skills and computational thinking in the curricula for all students. It is further recommended to establish performance indicators for these elements, considering the extent and quality of use of digital infrastructures by students, and to assess outputs through a national exam, as is done in other countries. In particular, the Ministry of Education should act to reduce the digital gaps in the Arab and ultra-Orthodox sectors.

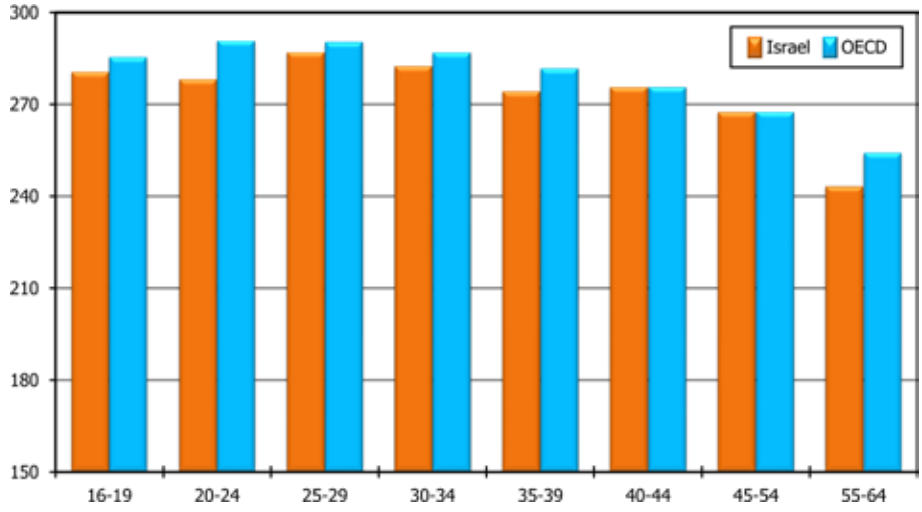
- **Imparting digital skills to teachers:** It is recommended that the Ministry of Education expand and adapt the training program for teachers in a way that will provide them with the digital skills required for fulfilling their jobs. It is recommended that the Ministry of Education will make this program accessible online to all teachers, and monitor its implementation.

- **Monitoring and control of the use of digital educational content by students and teachers:** It is recommended that the Ministry of Education develop a management-system that will include all data related to digital content being used in schools by teachers and students — both the scope of use and the quality of learning resulting from it. In this way, the Ministry would have the data needed to enable it to assess the effectiveness of the learning using digital content.

- **The scope of Government activity to teach digital literacy to adults:** It is recommended that the Digital Israel Initiative, the Ministry of Labor, the Ministry of Science and the Employment Service act together and each in its sphere of responsibility, to significantly increase the share of adult participants in government-sponsored programs for promoting digital literacy. It is also recommended that they promptly formulate a coordinated program, delineating the aspects necessary for effective teaching of digital literacy and setting measurable goals. Actions should also include efforts towards increasing awareness among groups lacking digital literacy to the importance of acquiring it, as well as measurement and assessment of programs. Such efforts are expected to contribute to narrowing the digital gap as well as socioeconomic gaps, and in the future, improve labor productivity.

- **Imparting digital literacy to adults from the Arab and ultra-Orthodox populations:** It is recommended that the Digital Israel Initiative, the Ministry of Labor and the Ministry of Science, in cooperation with the Employment Service and the Ministry of Finance, work jointly to plan and lead actions to promote digital literacy, taking into consideration the wide scope of the populations in need—about 1.4 million adults in the Arab and ultra-Orthodox populations and another 2.3 million adults (approx.) from the general public—to ensure optimal integration of populations with low levels of digital literacy in the changing labor market, especially the Arab and ultra-Orthodox populations. It would be appropriate to utilize the opportunities arising from the economic and employment crisis caused by the Covid-19 pandemic, in order to advance the level of digital literacy of as many groups as possible, which will enable them to occupy stable, quality jobs in the future.

The average score in the PIAAC 'problem solving in technology-rich environments' test in Israel, compared with the OECD average, by age groups, 2015



According to OECD data[7]; processed by the Office of the State Comptroller

Summary

As digital literacy is considered essential for quality and lasting employment in the changing labor market, promoting digital literacy has the capacity to prevent the broadening of gaps and to improve labor productivity. For this reason, promoting digital literacy should be set as a goal to be achieved in all learning and training environments. Emphasis should be placed on imparting the various types of digital skills to children and youth—as tools they will employ throughout their lives and as a basis for lifelong learning; as well as enabling adults who do not have a strong grasp of these skills, to acquire them. At the time the audit was completed, the COVID-19 pandemic had erupted in Israel and around the world, its impact emphasizing the need of students and teaches for digital literacy that underpins remote learning; It is also recommended to improve the levels of digital literacy among adults, with an emphasis on the unemployed, in order to enable them to integrate into the changing labor market in stable, quality employment.

7 PIACC data explore [link]