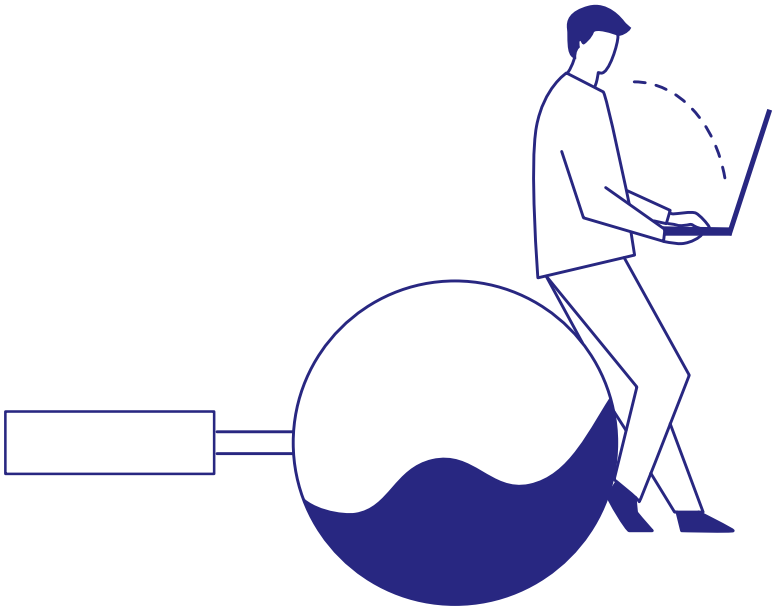
OFFICE OF THE STATE COMPTROLLER
AND OMBUDSMAN OF ISRAEL

EUROSAI
European Organisation of Supreme Audit Institutions

WORKFORCE 2030



CHALLENGES AND OPPORTUNITIES

OFFICE OF THE STATE COMPTROLLER
AND OMBUDSMAN OF ISRAEL

EUROSAI
European Organisation of Supreme Audit Institutions

WORKFORCE 2030

CHALLENGES AND OPPORTUNITIES

CONSOLIDATED REPORT
EUROSAI SG1 PROJECT

Catalogue Number: 2021-005E
ISSN 0793-1948

CONTENTS

MESSAGE FROM THE STATE COMPTROLLER AND OMBUDSMAN OF ISRAEL 6

INTRODUCTION: GLOBAL TRENDS & CHALLENGES FOR WORKFORCE 2030 9

Labour market trends 10
International commitment to the future workforce 15
Integrating information about required labour market skills 16
COVID-19 crisis implications 19

ABOUT THE PARALLEL AUDIT PROJECT 25

1ST THEME: THE EDUCATION SYSTEM AND HIGHER EDUCATION 31

Finland Basic Workforce Indicators 34
National Audit Office of Finland 38
Future workforce 2030: Taking future competence needs into account in the basic education steering system 38
Israel Basic Workforce Indicators 52
The Office of the State Comptroller and Ombudsman of Israel 56
The Preparedness of the Israeli Ministry of Education for the Changing Labour Market 56
The Office of the State Comptroller and Ombudsman of Israel 70
The Learning Environment in Secondary Schools as the Infrastructure for Providing 21st Century Skills 70

2ND THEME: VOCATIONAL TRAINING AND ADULT LEARNING 85

The Office of the State Comptroller and Ombudsman of Israel 88
Adapting Lifelong Learning and Vocational Training for Adults to the Changing Labour Market 88
Bulgaria Basic Workforce Indicators 100
National Audit Office of Bulgaria 104
Vocational Training of Adults 104
Korea Basic Workforce Indicators 126
The Board of Audit and Inspection of the Republic of Korea 129
1. Operation and Management of Vocational Training 130
2. Workforce Development in Special Purpose Universities 137

3RD THEME: DIGITAL SKILLS 145

European Union (EU) Basic Workforce Indicators 148
European Court of Auditors (ECA) 152
EU Actions to Address Low Digital Skills 152
The Office of the State Comptroller and Ombudsman of Israel 164
Teaching Digital Literacy for Children and Adults 164
The Office of the State Comptroller and Ombudsman of Israel 178
State Actions to Increase the Number of Employees in the HiTech Industry 178

4TH THEME: GOVERNMENTAL PLANNING 193

Italy Basic Workforce Indicators 196
The Court of Audit of Italy 199
Citizenship Income Scheme and Labour Market: The Functioning of the Job Centres 199
North Macedonia Basic Workforce Indicators 212
State Audit Office of the Republic of North Macedonia 215
Government Planning - Effectiveness of Government Measures for Addressing Labour Market Risks and Planning Funds for Overcoming These Risks 215

INSIGHTS FROM THE COOPERATIVE PROJECT 225

Case studies and examples of state policies addressing workforce 2030 challenges 226
Additional relevant audits performed or planned by the participating SAIs 234
Insights for the future - The challenges of the changing labour market present extensive audit opportunities for SAIs 240

MESSAGE FROM THE STATE COMPTROLLER AND OMBUDSMAN OF ISRAEL

Extensive and rapid changes occur in the labor market around the world, resulting in new combinations between technologies from different fields - physical, biological and digital. The scope of these changes, as well as the speed of their occurrence emphasize the need to adapt the skills provided to students by the education system – the future workers – as well as the skills of current workers, to those changes.

Many SAIs around the world acknowledged the importance of this issue, and the role State audit Institutions have in monitoring Governments actions for dealing with emerging issues and for ensuring States preparedness for crisis and future changes.

For that reason, the initiative to conduct a parallel audit was introduced to other SAIs during the III EUROSAI ASOSAI Joint Conference, held in Jerusalem (Israel) in 2019 under the theme "Emerging Issues and Emergency Situations".

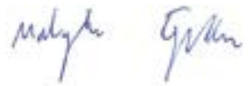
With broad interest of SAIs, the parallel audit project was approved and included as one of the projects under EUROSAI Strategic Goal 1 - Supporting effective, innovative and relevant audits by promoting and brokering professional cooperation. The Office of the State Comptroller and Ombudsman of **Israel** led the project with the following participating SAIs: National Audit Office of **Bulgaria**, European Court of Auditors - **ECA**, National Audit Office of **Finland**, The Court of Audit of **Italy**, State Audit Office of the **Republic of North Macedonia**, and the Board of Audit and Inspection of the **Republic of Korea** (from ASOSAI).

While working on the parallel audit, the world faced major challenges as a result of the COVID-19 pandemic outbreak, which significantly affected the labor market. The employment crisis caused by the outbreak of the COVID-19 pandemic in March 2020 emphasizes the importance of investing in human capital, in the unemployed, and in future workers (today's children and youth), in order to increase their employment capabilities in a constantly changing reality and to reinforce the high-tech sector. This is especially true for low-skilled and economically disadvantaged population-groups. According to a number of assessments, the COVID-19 crisis accelerated some labor market trends that will still continue once the crisis abates. Thus, this time of crisis also serves as an opportunity for change. Investment in acquiring skills in the various training and learning environments may improve chances for stable and quality integration in the changing labor market.

The participating Supreme Audit Institutions (SAIs) examined how the authorities in their countries, or the EU for ECA, addressed the various challenges of preparedness for workforce 2030. They did so in a wide spectrum of aspects, regarding the human capital of current workers as well as of children and youths, who constitute the future workforce. This consolidated report includes the summaries of their reports.

I wish to thank all employees of the participating SAIs for taking part in this important project, for their cooperation and for conducting a comprehensive, thorough and professional audit, which I believe will contribute to SAIs and States around the world, in their handling of changes and crises and assist Governments in determining goals and actions.

I sincerely hope that this parallel audit will set an example for future fruitful collaborations between SAIs, and that projects of this kind can be carried out successfully for the benefit of the public.



Matanyahu Englman
State Comptroller
and Ombudsman of Israel
First Vice-President of EUROSAI

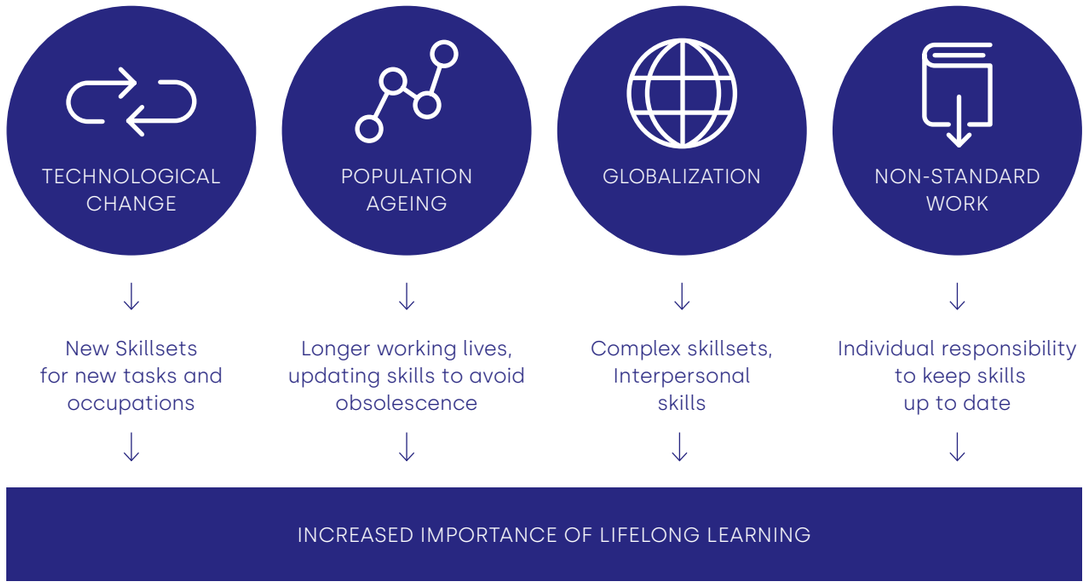
INTRODUCTION:
GLOBAL TRENDS & CHALLENGES FOR WORKFORCE 2030

GLOBAL TRENDS & CHALLENGES FOR WORKFORCE 2030

LABOUR MARKET TRENDS

The world is undergoing momentous, rapid changes, as part of what is often called "the Fourth Industrial Revolution". In this new reality, change is permanent and disruption is the new normal. New technologies blur the boundaries between the physical, biological and digital worlds, with unprecedented speed, extent and influence.[1] These trends accompany other social and economic processes which impact labour markets:

FIGURE 1:
Trends affecting the labour market and workforce requirements



Source: OECD[2]

Roles and work-activities are transforming: Labour market trends are manifested in transformations in workers' roles and work activities. Studies show that activities which can be replaced by mechanization (e.g. by machines, computers, robots or artificial intelligence - AI) are expected to decline in number. Therefore, some routine activities will no longer be part of workers' roles, and there will be an increase in activities demanding the use of technology and activities which rely on distinctly human qualities (such as creativity and social competences). Thus, certain professions may disappear completely and new ones will be created:

FIGURE 2:
Trends in workers' roles in developed countries

SOME ROLES MAY DISAPEAR

- Food preperation assistants
- Drivers
- Machine operations
- Telemarketers
- Data entry keyers
- Insurance underwriters
- Tax Preparers
- Freight agents
- Tellers

THE MIX OF ACTIVITIES WHITIN ROLES WILL CHANGE

- Routine and automatable tasks will become redundant
- New tasks will emerge, requiring the use of technology or "human faculties" (creativity, social and emotional skills and advanced cognitive capabilities)

NEW ROLES WILL BE CREATED

- Difficulties in forecasting which roles and when
- New roles may require skill levels unvailable to workers in at-risk jobs, and may be in locations inconvenient for them

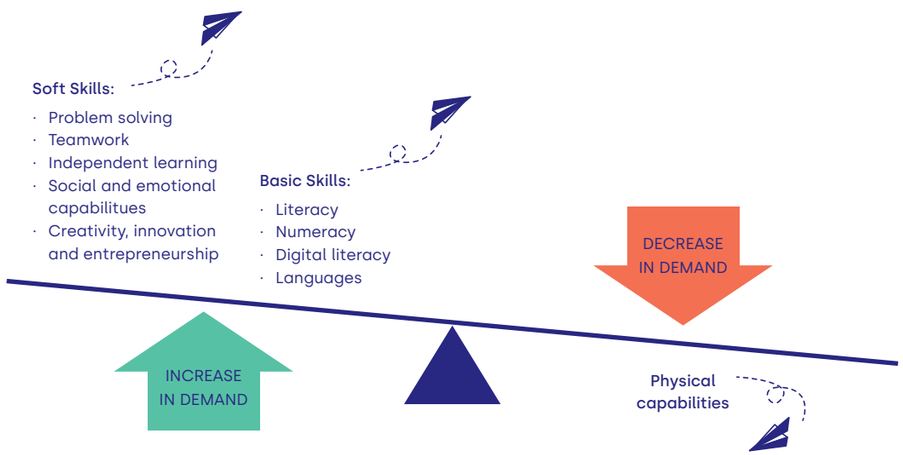
Source: information from international studies[1]

The OECD (the Organisation for Economic Co-operation and Development) estimated in 2018 that about half of the jobs in OECD countries are likely to be significantly affected by automation (with large variance across countries). The occupations with the highest estimated automatability typically only require basic to low level of education and low skill levels.[4]

According to a McKinsey Global Institute report from 2017, a midpoint automation adoption rate will cause about 15% of workers to be potentially displaced by 2030. However, it is difficult to predict the social, political and economic trends that will influence the rate of adoption of technology and changes in roles. For example, the McKinsey Institute estimated in 2021 that the COVID-19 pandemic accelerated trends in the labour market that may reshape work after the pandemic recedes, such as remote work, e-commerce, and adoption of automation and AI. According to the updated estimation, which took into consideration the consequences of the pandemic, in certain occupations, the percentage of jobs that might become obsolete by 2030 is higher than 15%. For example, in the eight leading countries examined, the number of workers who may need to find new occupations was increased by 13% in the post-COVID-19 scenario[5].

Skill requirements are changing: The changes in workers' roles and tasks demand new skills, capabilities, competencies[6], and knowledge - both from current workers and from those seeking to fill new positions. For example, a comprehensive global study carried out by the World Economic Forum found that between 2018 and 2022, 42% of the skills required of workers are expected to change, and more than half of workers, 54%, may need re-training or require a significant skills-upgrade in order to remain relevant in their roles.[7] Thus, while continuing the demand for formal professional knowledge, employer demands of workers are changing:

FIGURE 3:
Trends in demand for labour market skills[8]



Source: The figure is based on information from international studies[9]

These trends, of a decrease in demand for physical skills and an increase in demand for high-level cognitive skills, as well as digital and technological skills - are estimated to continue in the future.[10]

FIGURE 4:
Predicted change in demand for skill by 2030, selected countries

INCREASE DECREASE

		Advanced						Emerging	
	Skill/skill category	France	Germany	Japan	Spain	United Kingdom	United States	China	India
Technological skills	Basic computer skills	52	25	31	50	49	37	75	171
	Scientific research and development	21	12	13	15	21	26	25	71
	Technology design, engineering, and maintenance	18	6	14	9	13	15	22	61
	Advanced IT skills and programming	10	1	2	-2	2	14	49	78
	Data analysis and computational skills	-26	-21	-21	-37	-19	-29	-1	26
Social and emotional skills	Interpersonal skills and empathy	32	25	25	28	28	42	60	70
	Leadership and managing others	23	15	17	20	18	28	24	15
	Advanced communication and negotiation skills	22	13	15	19	17	24	1	10
	Enterpreneurship and initiative-taking	22	19	26	10	18	25	32	37
	Adaptability and continuous learning	11	-2	8	18	9	16	21	32
	Teaching and trainig others	14	6	4	5	11	13	22	40
Higher cognitive skills	Creativity	24	15	24	23	18	31	26	56
	Critical thinking and decision making	15	6	6	9	10	15	-3	4
	Complex information processing and interpretation	-4	-7	-5	-6	-4	1	2	19
	Project management	0	-5	-4	-5	-5	1	3	0
	Quantitative and statistical skills	-25	-36	-25	-20	-21	-28	-19	0
	Advanced literacy and writing	-19	-24	-4	-17	-17	-26	3	13
Pgysical and manual skills	Gross motor skills and strength	8	-4	-10	-3	2	2	-9	17
	Fine motor skills	-1	-8	-11	-7	2	5	-14	8
	General equipment repair and mechanical skills	1	-7	-8	-3	3	1	-18	9
	Craft and technician skills	-12	-17	-20	-15	-8	-4	-29	12
	General equipment operation and navigation	-12	-19	-25	-14	-4	-7	-23	5
	Inspection and monitoring	-19	-23	-21	-19	-14	-7	-25	-1
Basic cognitive skills	Basic literacy, numeracy, and communication	-11	-16	-9	-11	-12	-11	-4	9
	Basic data input and processing	-26	-29	-29	-25	-26	-29	-17	0
Change in size of labor force due to demographics		4	-5	-5	-1	3	3	-5	14

Source: McKinsey Global Institute, **The future of work after COVID-19** (Feb. 2021), p. 94

Challenges and implications: Changes in roles and skills present a challenge for many countries. There is an urgency to update the training and preparation that education systems provide, as well as improve the skills of those who are already part of the workforce. The challenge is particularly critical for low-skilled workers. There is also a pressing need for comprehensive government planning in order to improve the preparedness of the workforce and of government agencies for the changes in the labour market.

If these challenges are not met, many - children, youths and adults, mainly the low-skilled and disadvantaged - may be excluded from the labour market. This outcome may consequently lead to the widening of social disparities and increased poverty rates. As for the market perspective, profitable and innovative sectors, such as high-tech, may have difficulties expanding without sufficient supply of skilled workers, thus economic growth may be hindered. It is for these reasons, that meeting the challenges of workforce 2030 is crucial.

FIGURE 5:
International norms for the promotion of Lifelong Learning and the future of work

UN SDGS FOR 2030 (2015)

- **SDG 4**: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
  - **Target 4.1:** Ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes
  - **Target 4.3:** Ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university
  - **Target 4.4:** Substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship
- **SDG 8:** Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
  - **Target 8.5:** By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value
  - **Target 8.6:** By 2020, substantially reduce the proportion of youth not in employment, education or training.

ILO – DECLARATION FOR THE FUTURE OF WORK AND GLOBAL COMMISSION ON THE FUTURE OF WORK (2019)

- Develop a human-centered approach to the future of work by strengthening the capacities of all people to benefit from the opportunities of a changing world of work.
- **Lifelong learning for all:** the formal recognition of a universal entitlement to lifelong learning and the establishment of an effective lifelong learning system.
- **Supporting people through transitions:** more investment in the institutions, policies and strategies that will support people through future of work transitions.

UNESCO - RECOMMENDATION ON ADULT LEARNING AND EDUCATION (2015)

- Develop comprehensive, inclusive and integrated policies for adult learning and education in its various forms.
- Promote participation, inclusion and equity so that no individual is excluded from adult learning and education and that quality learning opportunities are available to all women and men of diverse social, cultural, linguistic, economic, educational and other backgrounds.

EUROPEAN COMMISSION - THE EUROPEAN PILLAR OF SOCIAL RIGHTS (2017)

- **Education, training and life-long learning:** Everyone has the right to quality and inclusive education, training and life-long learning in order to maintain and acquire skills that enable them to participate fully in society and manage successfully transitions in the labour market.
- **Active support to employment:** Everyone has the right to timely and tailor-made assistance to improve employment or self-employment prospects. This includes the right to receive support for job search, training and re-qualification. Everyone has the right to transfer social protection and training entitlements during professional transitions.
  Young people have the right to continued education, apprenticeship, traineeship or a job offer of good standing within 4 months of becoming unemployed or leaving education.
  People unemployed have the right to personalised, continuous and consistent support.

Source: The documents mentioned in the figure[11]

INTERNATIONAL COMMITMENT TO THE FUTURE WORKFORCE

As the workers need to constantly update their skills and knowledge in order to enter the labour market and remain relevant in it, many international organizations recognized the increasing importance of Lifelong learning - ongoing learning and training at all stages of life, in line with the fast rate of change in the labour market. Some of the key international norms include:

INTEGRATING INFORMATION ABOUT REQUIRED LABOUR MARKET SKILLS

In light of the rapid and broad transformations in labour markets, countries seeking to prepare their workforce need a continual assessment of which skills are most in demand, in which sectors, and for how many workers. Accurate assessments of required skills are necessary in order to correctly adapt the ways education systems prepare children, and to update vocational trainings and adult learning programs.

Thus, the OECD stressed that in order for policies aimed at narrowing skill gaps to be effective, they must be based on extensive reliable information about the current and future skill needs of the local labour market in every country. This information should be collected systematically and in collaboration with all relevant stakeholders – the business sector, the non-governmental sector, and all relevant government entities. The information, and predictions thereby created, may serve the various systems of education, training, and employment services, as well as immigration policies. The OECD emphasized that the higher the level of cooperation and coordination between the sectors, the more effective and beneficial the systems will be for all concerned.[12] There are various models of this in OECD countries, for example the following:

FIGURE 6:
Models for co-ordination and integration of information on skill needs assessment, selected countries

NORWAY

Employment and education authorities - jointly involved in the design and development of the forecasts carried out by Statistics Norway, which ensures that they understand the outputs and use them for policy making

IRELAND

The Expert Group on Future Skills Needs (EGFSN) and the Further Education and Training Authority (SOLAS) - in charge of skills assessment and anticipation exercises and involve ministries, regional agencies and other public bodies

UK

The UK commision for employment and skills, a publicly-funded, industry-led oraganisation - provided guidence on skills and employment; produced major employer-based surveys; oversaw a "Working Futures" model for long-term macro-econimic projections of employment demand (since 2017 - under the Department of Education)

SOUTH AFRICA

The Department for Higher Education and Training - produces an annual list of top 100 occupations in high demand, using a combination of data analysis, econometric modelling,literature reviews and stakeholder engagement

FINLAND

The "Skills Anticipation Forum" of the ministry of Education and Culture - founded in order to avoid overlapping anticipation exercises; to promote closer interaction between education and labour market actors; and to improve impact of skills anticipation

PORTUGAL

"ANQEP", an agency astablished under the supervision of the Ministry of Education and Science and Ministry of Solidarity Employment and Social Security, in co-operation with the Ministry of Economy - improved inter-ministerial and stakeholders collaboration in employment and vocational training policies

CANADA

"Future Skills" initiative - consists of an independent council and a canter to improve information on emerging skills anf workforce trends

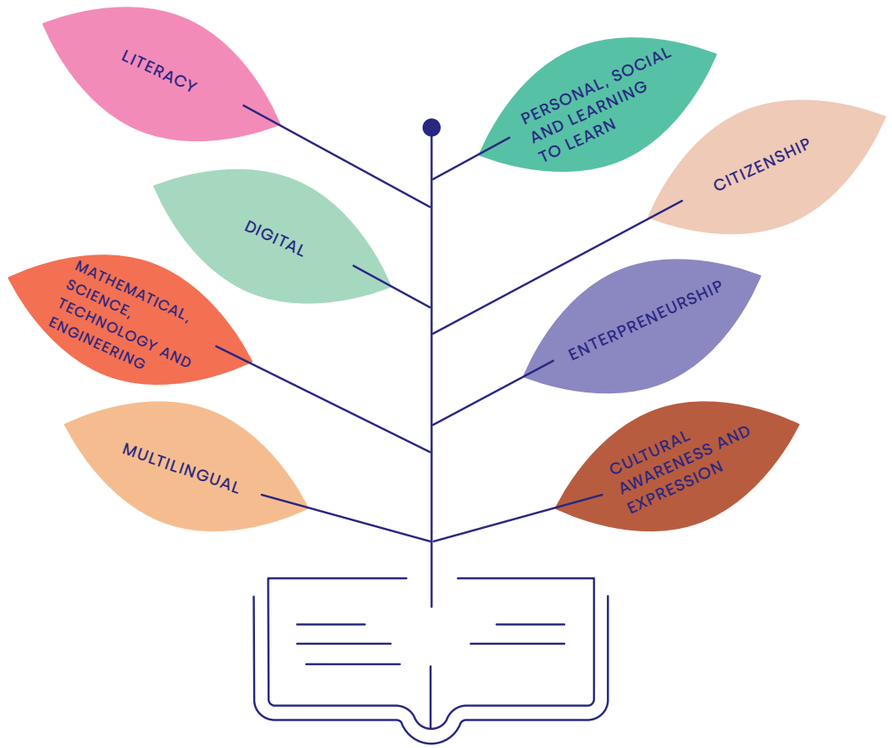
FRANCE

"Employment and Skills Network" - facilitates the creation of a common methodological framework for regional and sectoral anticipation studies; coordinating activities to share experience, methods and tools

Source: based on information from the OECD and other publications[13]

In 2016 the European Commission communicated the European Skills Agenda (revised and renewed in 2020) to improve worker skills, promote digital competence and advance sectorial cooperation on required skills.[14] In this context, the EU Council published in 2018 its recommendation on key competences to be developed in lifelong learning:[15]

FIGURE 7:
Key competences for lifelong learning, according to the EU



Source: EU[16]

Accordingly, effective investment in human capital development should base itself on assessments that are as comprehensive, updated and as accurate as possible regarding the skills requirement in the changing labour market.

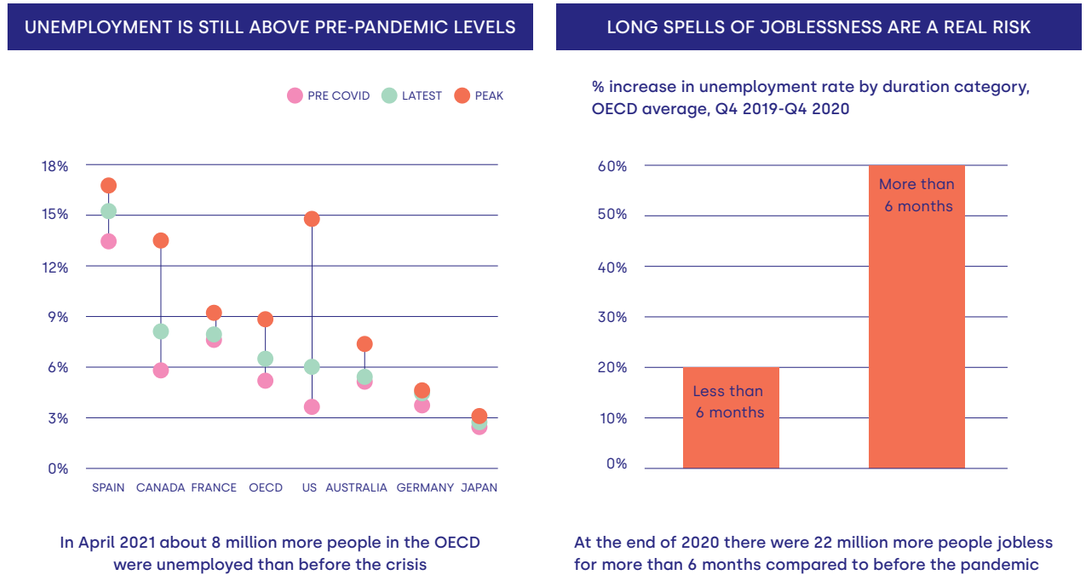
COVID-19 CRISIS IMPLICATIONS

The COVID-19 pandemic that broke out at the beginning of 2020 had profound and wide-ranging implications for labour markets and economies around the world. The OECD estimated that there is a real danger that the crisis will increase poverty and widen inequalities, with the impact felt for years to come.

GDP fell substantially in the first half of 2020 across OECD countries, and the initial impact of the COVID-19 crisis on OECD labour markets has been ten times larger than that observed in the first months of the 2008 global financial crisis, taking into account both the drop in employment and the reduction in hours worked among those who remained in work.[17]

Millions of people have been unable to go to work, resulting in an exceptionally stark drop in activity and unprecedented job losses. At the end of 2020, around 22 million jobs had vanished in the OECD compared to 2019, and globally 114 million jobs had disappeared. Despite the gradual recovery, across the OECD economies, around 8 million more people than prior to the crisis remained unemployed in April 2021, inactivity rates have risen and aggregate employment rates have declined.[18]

FIGURE 8:
Unemployment during the COVID-19 pandemic



Source: OECD[19]

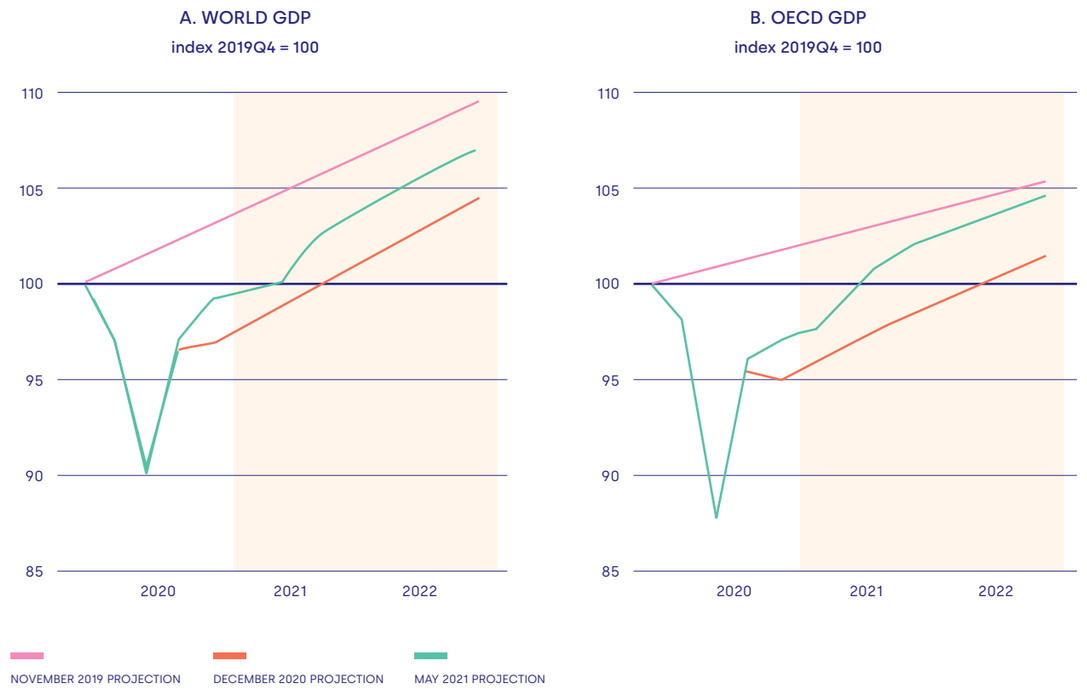
In March 2021 hours worked were still 7% below the level in December 2019, on average across the ten countries for which up-to-date hours worked statistics are available. This is halfway from the crisis trough that was reached in the second quarter of 2020, when total hours worked fell by over 15% across the OECD. Shortfalls in total hours worked had marked differences across sectors: they were concentrated largely in job-rich service activities with high levels of social interactions, such as leisure, hospitality, transportation, and retail and wholesale trade. Taken together, these sectors account for between 20-30% of employment in most developed economies, highlighting the still-precarious nature of many jobs.[20]

FIGURE 9:
Change in work and employment

Source: OECD[21]

Prospects have improved by the end of 2020 with signs of a rebound in goods trade and industrial production becoming clear. Prospects for a lasting global recovery continue to improve since, helped by the gradual deployment of effective vaccines, continued macroeconomic policy support and signs that economies are now coping better with measures to suppress the virus. However, output in March 2021 remained around 1.5% below the pre-pandemic level. Global GDP growth was projected in May 2021 to rise by 5.75% in 2021 and close to 4.5% in 2022[22] - but much will depend on the race between vaccines and emerging variants of the virus. Many OECD countries will not re-gain the pre-COVID GDP levels before 2022, and for many emerging and developing countries this target will take even longer to reach.[23]

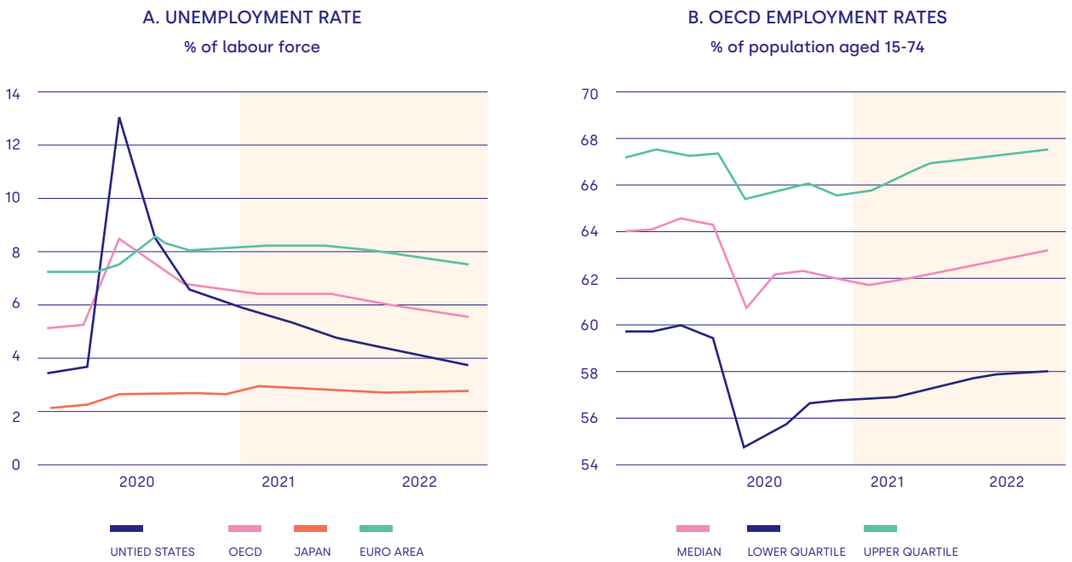
FIGURE 10:
Global GDP recovery projections



Source: OECD[24]

Labour market conditions are recovering slowly, with job retention measures continuing to help preserve employment in Europe and Japan. However, in developing countries, substantial job losses have increased poverty and deprivation of millions of workers. By the end of 2022, the employment rate in the median OECD economy is projected to still be below that at the end of 2019, with diverse outcomes across countries. Participation rates also remain below the pre-pandemic level in many countries at the end of 2022.[25]

FIGURE 11:
Unemployment rate forecast: December 2020 Projection, % of labour force, Q1 2019 – Q4 2022

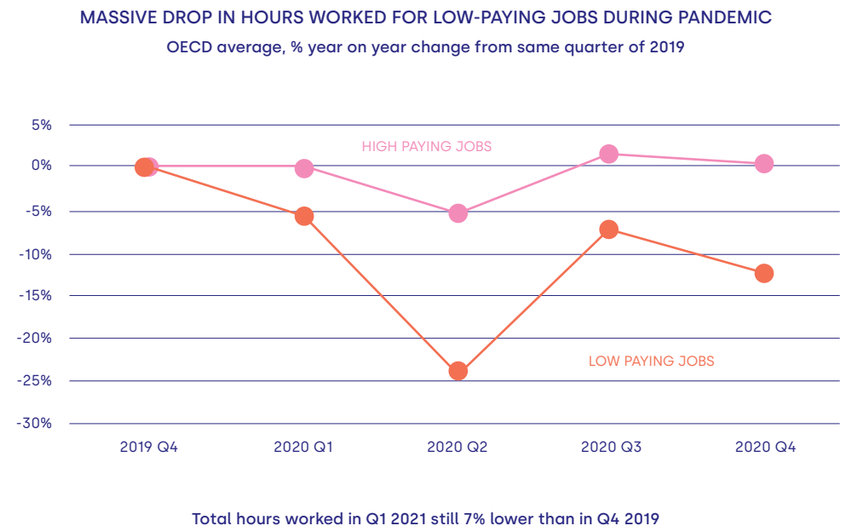


Source: OECD[26]

The COVID-19 crisis has accentuated – and further deepened – economic and social divides in the OECD, as it had a greater impact on some workers than others. Young people and women are among those at greatest risk of joblessness and poverty. They generally have less secure, unskilled jobs and are highly represented among workers in industries most affected by the crisis, such as tourism and restaurants. Young people are confronted with a tough job market that could compromise their futures; Women and low-paid workers likely face greater unemployment; and part-time, temporary and self-employed workers, who make up 40-50% of the workforce in hard-hit sectors, are bearing the brunt.[27]

The economic and employment crisis stemming from the COVID-19 pandemic highlighted the importance of investing in human capital for current workers, future workers (children and youths) and the unemployed - in order to increase their employability in a changing labour market. This is especially true for low-skilled and economically disadvantaged population groups. According to a number of assessments, the COVID-19 crisis accelerated some labour market trends that will still continue once the crisis abates.[29] Thus, this time of crisis also serves as an opportunity for change. Investment in acquiring skills in the various training and learning environments may improve chances for stable and quality integration in the changing labour market.

FIGURE 12:
Workers in low-paying jobs during the COVID-19 pandemic

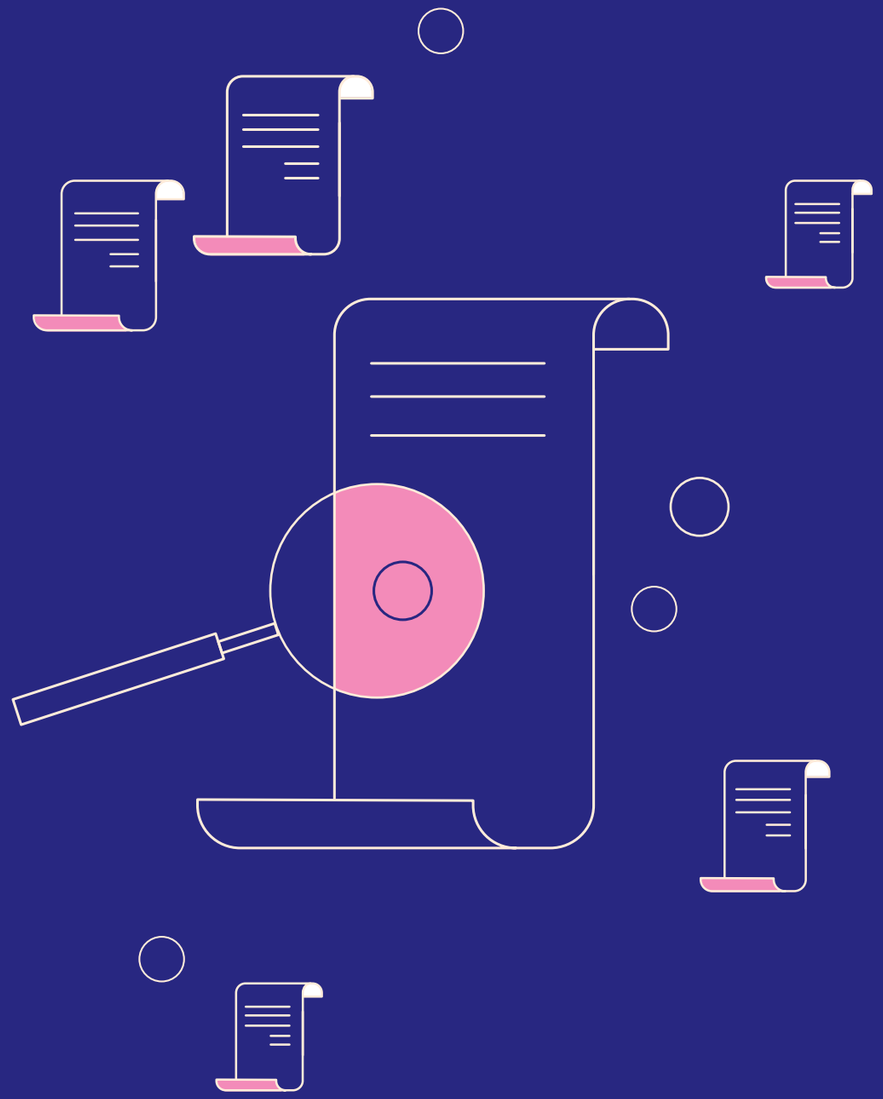


Source: OECD[28]

To quote the OECD secretary-general:

"In times of crisis, 'normality' sounds very appealing. However, our normal was not good enough for the many people with no or precarious jobs, bad working conditions, income insecurity, and limits on their ambitions. We need to capitalise on the momentum created by the strong initial national responses to the crisis, and build better policies for better lives in the post-COVID world."[30]

In view of the global importance of the preparedness for the changing labour market, the issue was chosen for parallel audit under international cooperation. The participating Supreme Audit Institutions (SAIs) examined how the authorities in their countries, or the EU for ECA, addressed the various challenges of preparedness for workforce 2030. They did so in a wide spectrum of aspects, regarding the human capital of current workers as well as of children and youths, who constitute the future workforce. The summaries of their reports are presented in this consolidated report.



ABOUT THE PARALLEL AUDIT PROJECT

ABOUT THE PARALLEL AUDIT PROJECT

'Workforce 2030 - Challenges and Opportunities' was conducted as a parallel audit under the auspices of EUROSAI Strategic Goal 1 - Supporting effective, innovative and relevant audits by promoting and brokering professional cooperation. The Office of the State Comptroller and Ombudsman of **Israel** led the project with the following participating SAIs: National Audit Office of **Bulgaria**, European Court of Auditors - **ECA**, National Audit Office of **Finland**, The Court of Audit of **Italy**, State Audit Office of the **Republic of North Macedonia**, and the Board of Audit and Inspection of the **Republic of Korea** (from ASOSAI).

The project set out initially in March 2019, when in it was introduced in a workshop during the III EUROSAI ASOSAI Joint Conference, held in Jerusalem (Israel) under the theme "Emerging Issues and Emergency Situations". The cooperation on the project included a kick-off meeting in Helsinki (Finland) in September 2019, a second meeting in Tel-Aviv (Israel) in January 2020, and a third meeting - held virtually and led by SAI Bulgaria - in October 2020. SAI Israel had also set up an online collaboration platform, where the participating SAIs could hold discussions and share information and materials. More than 150 files and links were uploaded there during the project.

Workforce 2030 themes: Within the wide-ranging issues relating to Workforce 2030, the parallel audit focused initially on three themes:

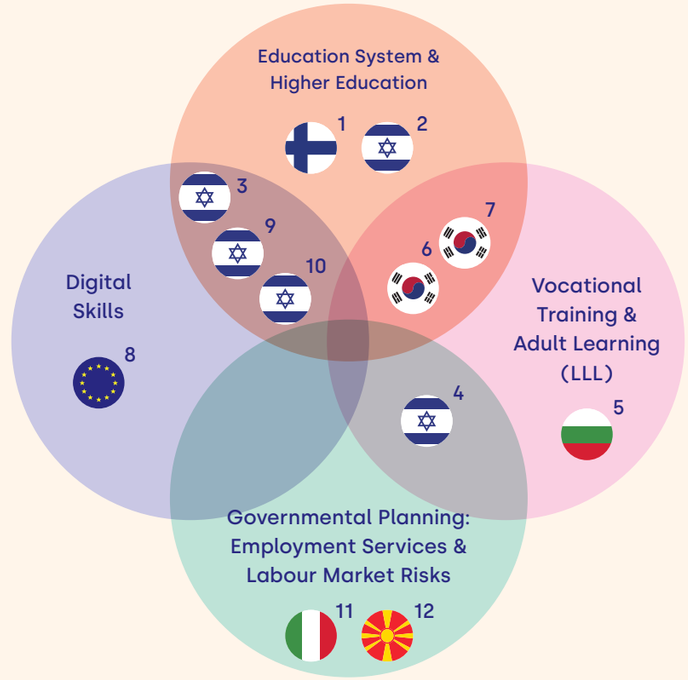
- **The Education System and Higher Education -** How are they preparing for changes in the labour market?
- **Vocational Training & Adult Learning -** How are governments adjusting their vocational training plans to the evolving and disappearing professions and industries? How are they addressing the growing need for reskilling, upskilling and LifeLong Learning for adults?
- **Governmental Planning -** How do governments address market failures and plan their investment faced with a dynamic labour market?

In relation to these three themes, a fourth theme emerged -

- **Digital Skills -** How do governments promote digital skills of varying levels for children and adults?

Each participating SAI chose which themes to focus its national audit on. The different themes naturally overlap somewhat. The following figure presents the distribution of the audits and reviews that form this consolidated report, across the different themes:

FIGURE 13:
Workforce 2030 - Parallel Audit themes

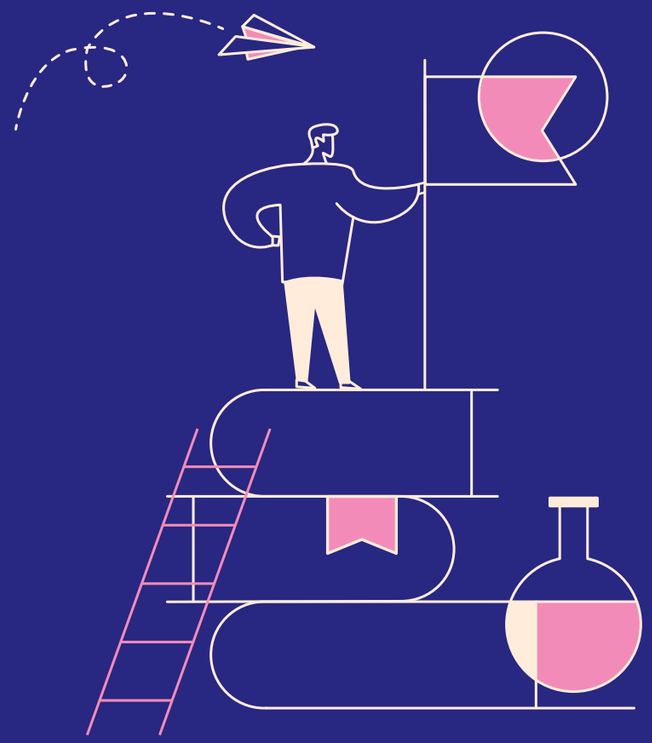


#	SAI of	**Audit/Review Title** (order of appearance in report)
1	Finland	Future workforce 2030: Taking future competence needs into account in the basic education steering system
2	Israel	The Preparedness of the Ministry of Education for the Changing Labour Market
3	Israel	The Learning Environment in Secondary Schools as the Infrastructure for Providing 21st Century Skills
4	Israel	Adapting Lifelong Learning and Vocational Training for Adults to the Changing Labour Market
5	Bulgaria	Vocational Training of Adults
6	Korea	Operation and Management of Vocational Training
7	Korea	Workforce Development Education in Special Purpose Universities
8	ECA	Review of EU actions to address low digital skills
9	Israel	Teaching Digital Literacy for Children and Adults
10	Israel	State Actions to Increase the Number of Employees in the HiTech Industry
11	Italy	Citizenship Income Scheme and Labour Market: The Functioning of the Job Centres
12	North Macedonia	Government planning - Effectiveness of government measures for addressing labour market risks and planning funds for overcoming these risks

Cooperative work method and benefits: As a parallel audit, the participating SAIs performed their separate audits/reviews more or less simultaneously. Each operated independently, reporting to its own governing body, and each could adopt a different audit approach best suited to its needs and preferences. Thus, the observations, findings, challenges and conclusions of each participating SAI's audit relate to its own country (or the EU for ECA).

The cooperative audit offered a number of mutual benefits, among which were benchmarking, knowledge sharing and improving audit methods. This consolidated report is the product of our cooperation.

Structure of the consolidated report: Each of the four themes opens with a short thematic introduction, followed by those summary reports most relevant to the theme. Each SAI's report is preceded by some local background information, offering basic workforce indicators for the country - including indicators of Demography, Economy, Employment, Education, Training, Skills, and Policy, as well as main country Trends, Challenges, and Strong Points with regard to workforce 2030. Thereafter, a concluding Insights section is presented, offering examples of policies from the participating countries relevant to workforce 2030, as well as relevant other audit assignments the participating SAIs undertook, ending with concluding remarks and thoughts for the future.



1ST THEME:

01

THE EDUCATION SYSTEM AND HIGHER EDUCATION

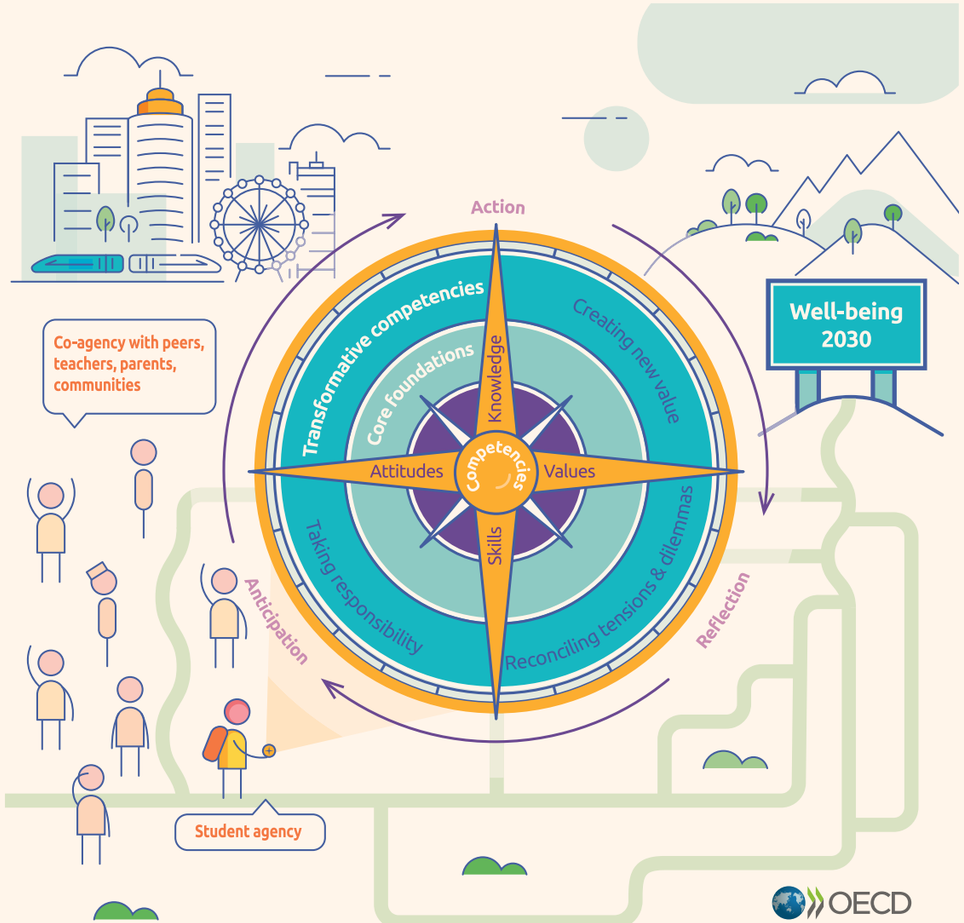
1ST THEME: THE EDUCATION SYSTEM AND HIGHER EDUCATION

Public investment in human capital can be easily divided into two segments: investment in children and youths before they enter the world of work, and investment in working-age adults. As for children and youths, the primary investment is through the education system, although in recent years growing emphasis has been placed on informal and non-formal learning, as well as on all the environments impacting a child's development, including the community and the family.

Education systems face an enormous challenge, not least because of their size, which often hinders the implementation of rapid changes. As current analysis predicts that workers in the changing labour market will be expected to develop and strengthen their personal and professional skills regardless of the professions they will hold, the success of education systems will be measured by their ability to meet these challenges. That means they have to prepare their graduates for the changes that can be expected in the future society in general, and in the labour market - which they will be expected to join - in particular.

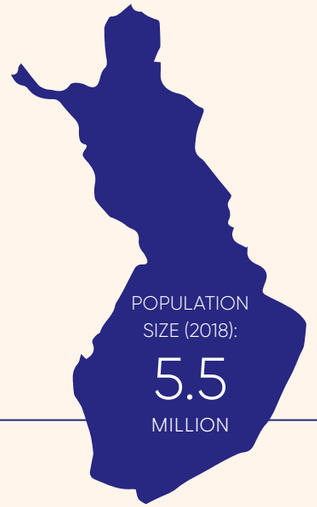
Therefore, students should develop the necessary skills throughout their educational continuum, as the UN's Education 2030 program delineates. This is in line with goal number 4 of the UN's 2030 Agenda for Sustainable Development (from 2015) - to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all, and its targets.[31] The Education 2030 program addresses, among other things, the need to impart the knowledge, skills and values that students will need in the future, including skills required in the labour market. The figure below presents the learning compass that shows how young people can navigate their lives:

FIGURE 14:
The OECD Learning Compass 2030



Source: OECD

FINLAND BASIC WORKFORCE INDICATORS[32]



DEMOGRAPHY, ECONOMY, EMPLOYMENT

WORKING AGE POPULATION (2018):

62.3%

OF POPULATION

GDP (2019):

51,404$

US/CAPITA

EMPLOYMENT RATE (2019):

73%

OF WORKING AGE POPULATION

LABOUR FORCE PARTICIPATION RATE (2019):

83.5%

OF 25-64 YEAR OLDS

LABOUR PRODUCTIVITY (GDP PER HOUR WORKED - 2019):

61.7$

US

PART-TIME EMPLOYMENT RATE (2019):

14.6%

OF EMPLOYMENT

SELF-EMPLOYMENT RATE (2019):

13.5%

OF EMPLOYMENT

TEMPORARY EMPLOYMENT (2019):

15.8%

OF WAGE/SALARY WORKERS

SHARE OF JOBS AT HIGH RISK OF AUTOMATION OR SIGNIFICANT CHANGE (2019)

33.6%

EMPLOYMENT IN HIGH- AND MEDIUM-HIGH TECHNOLOGY MANUFACTURING SECTORS (2019):

4.7%

OF EMPLOYMENT

EDUCATION, TRAINING, SKILLS

TERTIARY LEVEL EDUCATION (2019):

45.9%

OF 25-64 YEAR-OLDS

ADULT PARTICIPATION RATE IN FORMAL AND NON-FORMAL EDUCATION AND TRAINING (LAST 12 MONTHS - 2016):

54.1%

OF 25-64 YEAR-OLDS

LITERACY (ADULTS - PIAAC)

38%

AT PROFICIENCY LEVEL 2 OR BELOW (OF 5)

NUMERACY (ADULTS - PIAAC):

42%

AT PROFICIENCY LEVEL 2 OR BELOW (OF 5)

PROBLEM SOLVING IN TECHNOLOGY RICH ENVIRONMENT (ADULTS - PIAAC):

49%

AT PROFICIENCY LEVEL 1 OR BELOW (OF 3)

READING PERFORMANCE (15 YEAR-OLDS - PISA):

33%

AT PROFICIENCY LEVEL 2 OR BELOW (OF 6)

MATHEMATICS PERFORMANCE (15 YEAR-OLDS - PISA):

37%

AT PROFICIENCY LEVEL 2 OR BELOW (OF 6)

SCIENCE PERFORMANCE (15 YEAR-OLDS - PISA):

34%

AT PROFICIENCY LEVEL 2 OR BELOW (OF 6)

COLLABORATIVE PROBLEM SOLVING PERFORMANCE (15 YEAR-OLDS - PISA 2015):

18%

AT LEVEL 1 OR BELOW (OF 4)

SHARE OF INDIVIDUALS WHO HAVE BASIC OR ABOVE BASIC OVERALL DIGITAL SKILLS (ADULTS - EU SURVEY 2019):

76%

FINLAND BASIC WORKFORCE INDICATORS

POLICY

Government departments in charge of education and employment policy: Education: Finnish National Agency for education. Employment policy: Ministry of Economic Affairs and Employment, and State Employment Service Centers in the regions (15 in total)

Public expenditure on active labour market measures (2017): 0.99% of GDP

Gross domestic spending on R&D (2018): 2.76% of GDP

MAIN TRENDS OR CHALLENGES

Aging population is still one of the main challenges in Finland. On the other hand, there already is a lack of highly skilled workforce. Finnish economy is based on high skilled workforce so this combination might be an obstacle to economic growth in the future.

After all, there is a need to prepare for the work revolution caused by the mega trends of digitalization and globalization.

The working-age population has been shrinking since 2016 because of ageing. Yet, the impact of this on total population growth has so far been more than offset by positive net migration. The long-term outlook for labour supply looks weak as the fertility rate has dropped dramatically in the last 10 years and now ranks among the lowest in the EU.

Employment rate was historically high before the corona pandemic. Yet, long-term unemployment has been a challenge which can be reinforced by the pandemic. The rates of unemployment are highest to those with low education or migrant backgrounds. Labour shortages have been reported especially in the high skilled workforce (ICT sector) and low skilled and low paid workforce (construction, services). Finland has experienced an increase in high-skilled tasks relative to middle-skilled tasks and a decline in routine tasks. This indicates that in the short term the adult workforce needs to be reskilled and upskilled so it can better match labour market demand.

STRONG POINTS

In 2016, education expenditure accounted for 5.5% of Finland's GDP. The share was higher than the OECD and EU23 average.

Skills mismatches in Finland are below the EU average. The level of disparities in the labour market outcomes of the different skill groups (low-, medium-, and high-skilled) is below the EU average and has decreased since 2010. The vertical skills mismatch, i.e. when people are over-qualified, is below 20%. Participation in adult learning is already high in Finland, which helps when there is a need to reskill and upskill adult workforce.

According to Education at a Glance, countries invest in education because it is seen to help promote economic growth, enhance productivity, contribute to personal and social development and reduce social inequality, among other reasons. Among OECD countries, education is valued differently and the financial resources invested in it vary.

SUMMARY AUDIT REPORT 1

NATIONAL AUDIT OFFICE OF FINLAND

FUTURE WORKFORCE 2030: TAKING FUTURE COMPETENCE NEEDS INTO ACCOUNT IN THE BASIC EDUCATION STEERING SYSTEM

BACKGROUND

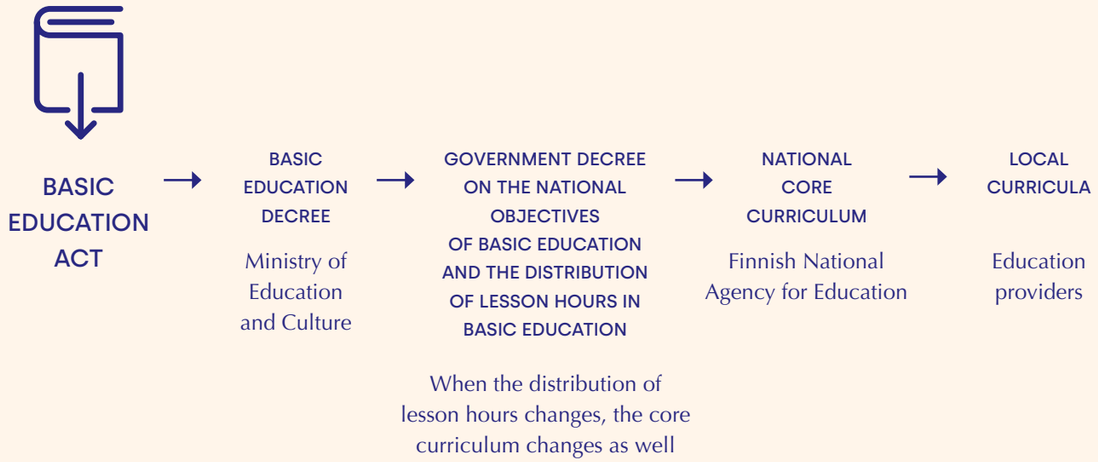
The audit assessed whether the steering of basic education in Finland succeeds in promoting future competence needs. In this audit, future competence needs refer to the general skills and competences that will have a significant role in future working life. These can include, for example, social skills and the skill of creative problem-solving. The audit was targeted at those parts of the basic education steering system which relate to the contents of basic education. Therefore, the audit focused on information-based and norm-based basic steering. In Finland, the steering of basic education is the responsibility of the Ministry of Education and Culture and the Finnish National Agency for Education, which operates in the administrative sector of the Ministry, and the statutory task of which is to steer basic education in Finland.

Under the Basic Education Act, the responsibility for organizing basic education in Finland lies with the local authorities, which also largely bear this responsibility in practice. The state may also grant the right to provide basic education to registered associations. Education can also be provided by the state.

On the level of central government, the norm-based steering system of basic education consists of the Basic Education Act, the Basic Education Decree, Government decrees and the core curriculum. Of these, the Basic Education Act defines the compulsory subjects that must be taught in basic education. In addition to them, other subjects can also be taught in schools. The National Core Curriculum for Basic Education[33], in turn, is a document that defines the contents and objectives of the teaching of various subjects. Under the Basic Education Act, the preparation of the core curriculum is the responsibility of the Finnish National Agency for Education. The National Core Curriculum for Basic Education is a document of about 500 pages and includes the objectives and assessment criteria for basic education. On the local level, it is the education providers that are responsible for drawing up their own local curricula based on the National Core Curriculum for Basic Education. The local curriculum defines the ways of implementing the objectives set by the regulation of the Finnish National Agency for Education and specifies the local focus areas in teaching. As the purpose of the audit was to examine whether the steering of basic education succeeds in creating conditions for effective promotion of future competence needs, the audit focused mainly on the national core curriculum, its drafting process and the related information-based steering.

The National Core Curriculum for Basic Education is revised approximately every ten years. A comprehensive update of the national core curriculum begins when the Government issues a new decree on the distribution of lesson hours in basic education. The Finnish National Agency for Education can also do partial updates, in which case only certain parts of the national core curriculum are updated. For example, a partial update concerning the section on pupil assessment entered into force in 2020. The latest comprehensive update of the National Core Curriculum for Basic Education was launched in 2012 by the official set-up letter of the Finnish National Agency for Education, the work was completed in 2014, and the core curriculum was introduced gradually in different grades between 2016 and 2019. In this report, the latest National Core Curriculum for Basic Education is referred to as the 2014 core curriculum.

FIGURE 15:
Hierarchy of the norm-based steering of basic education



KEY FACTS[34]

1. Basic education is organized by local authorities in 2,167 schools in Finland. These schools have 528,636 pupils.
2. There are 20 state-funded comprehensive schools in Finland, with 8,229 pupils studying in them.
3. There are 66 private comprehensive schools, with a total of 14,631 pupils studying in them.
4. Finland is a bilingual country, and therefore public basic education is mainly in Finnish or Swedish.
5. The state finances the education together with the local authorities. The operating expenses of basic education amount to around EUR 5 billion annually.

AUDIT ACTIVITIES/DETAILS

The audit was targeted at the Finnish National Agency for Education and the Ministry of Education and Culture. The audit examined primarily the norm-based steering by the audited entities. In addition, the audit examined the information-based steering insofar as it was related to promoting the contents of basic education. The audit did not examine the financial steering targeted at education providers.

The aim was to establish whether content steering promotes future competence needs. The criteria used in the examination of the competence needs were the competence needs identified by the OECD:[35]

· Learning to learn
· Student agency
· Multiliteracy
· Emotional skills
· Social skills
· Creative problem-solving

The main audit questions were:

1. Have future competence needs been taken into account in the steering and curricula of basic education?
2. Can the development of future working life abilities be seen in the activities of education providers?
3. Are the future competence needs of pupils in basic education promoted equally?

The audit evidence consisted of the document "National Core Curriculum for Basic Education 2014" and interviews of representatives of the Ministry of Education and Culture, the Finnish National Agency for Education and education providers. A total of 18 interviews were conducted. In addition, the audit evidence included a questionnaire survey for education providers, teachers and principals, as well as various steering documents related to content steering. The audit was conducted between March 2020 and June 2021.

The primary audit method was qualitative content analysis of the documents. Quantitative and qualitative analysis of the questionnaire survey data was also performed.

KEY FINDINGS

The norm-based steering of basic education promotes future competence needs

The National Core Curriculum for Basic Education which entered into force in 2014 extensively includes the future competence needs defined by the OECD and used as the audit criteria, as well as other skills assumed to be relevant in the future. The competence needs are largely included in the so-called broad-based competence areas in the curriculum, where they are described either with the formulation used in this report or in other terms.

The broad-based competence areas should be a cross-cutting element in all basic education, and the mastering of the competence areas should be assessed in pupil evaluations. The broad-based competence areas are defined in the curriculum as follows: "Broad-based competence refers to an entity formed by knowledge, skills, values, attitudes and will. Competence also refers to the ability to use knowledge and skills as required by the situation."[36]

Of the six competence needs identified by the OECD, three have been designated, as such, as broad-based competence areas in the core curriculum. These are learning to learn (L1 thinking and learning-to-learn), multiliteracy (L4 multiliteracy) and student agency (L7 participation, involvement and building a sustainable future). Two of the competence needs are included as such in other broad-based competence areas. These are social skills and emotional skills. The future competence need "creative problem-solving" is not included in the core curriculum at heading level, but related skills are included in the competence area of thinking and learning-to-learn (L1). Creative problem-solving has also been specified as a criterion for good competence in mathematics in all grades of basic education. See Table 1.

The aim was to make the national core curriculum that entered into force in 2014 skill-based instead of knowledge-based. Skill-based means that instead of setting targets for subject-specific knowledge, such as mastering the multiplication table in mathematics, targets are also set for more general skills needed in life, such as the broad-based competence areas. The previous national core curriculum, issued in 2004, was not yet skill-based in this sense, but its focus was still rather on knowledge specific for different subjects. In practice, this can be seen, for example, in that the core curriculum 2004 sets mainly targets for mastering knowledge related to different subjects, whereas the 2014 document sets targets not only for the contents of different subjects but also for the contents of the broad-based competence areas. Although the change is relatively clear, it appeared in the audit interviews that some of the education providers did not consider the change very radical. According to them, it was possible to derive the same skills to teaching from the core curriculum 2004 as from the 2014 version, although the latest core curriculum has highlighted the skills more prominently.

TABLE 1:
Future competence needs in the national core curriculum for basic education

Broad-based competence area in the core curriculum	OECD-defined future competence need included in the competence area
L1: Thinking and learning-to-learn	Learning to learn, creative problem-solving
L2: Cultural competence, interaction and expression	Social skills
L3: Taking care of oneself, managing daily life	Emotional skills, social skills
L4: Multiliteracy	Multiliteracy
L5: ICT competence	
L6: Working life competence and entrepreneurship	
L7: Participation, involvement and building a sustainable future	Student agency

Future competence needs have been brought to the core curriculum for basic education in cooperation with the key expert stakeholders

The Finnish National Agency for Education (EDUFI) drew up the National Core Curriculum for Basic Education 2014 together with the key expert stakeholders. The preparation of the core curriculum for basic education is the responsibility of EDUFI's General Education and Early Childhood Education and Care unit, which is also responsible for completing the plan. The unit carries out the work related to the core curriculum in addition to its other expert duties, and the Ministry of Education and Culture has not always allocated extra resources for the core curriculum work. However, the unit was able to draw up the core curriculum 2014 in the planned timeframe and scope.

In addition to EDUFI's officials, a large number of key stakeholders participated in the core curriculum work. EDUFI engaged educationalists, teachers and representatives of education providers and teachers' trade unions in the process. Pupils, in turn, were not represented in the work mainly because pupils of basic education age do not have a national representative body. During the core curriculum work, EDUFI also opened a website where anyone had an opportunity to comment on the contents of the core curriculum.

Experts outside EDUFI participated in the preparation of the curriculum voluntarily and were not paid separate compensation for the work. In individual cases, EDUFI commissioned articles from universities, for example. In these cases, the author had the opportunity to charge EUR 50 per page for the work. According to EDUFI, only a few writers took this opportunity.

EDUFI paid the external experts' travel expenses, and for example, schools whose teachers participated in EDUFI's events related to the preparation of the curriculum had an opportunity to apply for compensation for substitute costs from EDUFI.

EDUFI supported and steered the implementation of the core curriculum, but the support and guidance started to decrease significantly after the introduction of local curricula

Based on interviews with education providers and EDUFI's representatives and on document analyses, the audit came to the conclusion that the steering carried out by EDUFI worked primarily well until 2016, when the new core curriculum was drafted and the education providers drafted local curricula. However, the audit also found some deficiencies in the steering. Supporting the implementation of the core curriculum is part of the work of the officials of EDUFI's General Education and Early Childhood Education and Care unit.

EDUFI supported the implementation of the core curriculum and the drafting of local curricula generally by organizing training, answering questions from the field, distributing information through EDUFI's website and informing the education providers. This also included support for promoting future competence needs.

EDUFI's aim was for local curricula to be completed at the same time as the national core curriculum so that the implementation of the new core curriculum in the field could start immediately, albeit gradually. Based on the audit interviews, the comprehensive core curriculum update of 2014 succeeded in this sufficiently well. Steering and support worked in two directions: on the one hand, EDUFI informed the education providers on its own initiative about the content of the core curriculum work in order to support the preparation of local curricula at the same time as the core curriculum was completed, and on the other hand, the education providers informed EDUFI of the needs in the field regarding the core curriculum.

However, the guidance and support provided by EDUFI started to decrease significantly after the core curriculum and local curricula had been completed. This is evident, among other things, from EDUFI's roadmap for drawing up the core curriculum. The roadmap includes measures to support the implementation only until the completion and introduction of local curricula, i.e. the autumn of 2016. The local curricula were completed in 2016, and they were introduced by the first grades during the same autumn. However, the curricula were introduced by the last grades only in 2019. Thus, the roadmap does not contain any measures to support the implementation between 2016 and 2019, even though there had been a major, fundamental change to the core curriculum and the last grades did not introduce the core curriculum until three years after the first ones. The actual allocation of resources for support measures within EDUFI also ended when the core curriculum was completed. On the other hand, EDUFI organized continuing training for teachers even in 2016–2019. One of the themes of these continuing training sessions was related to pedagogy and the promotion of broad-based competence areas, i.e. the future competence needs.

The Finnish Education Evaluation Centre (FINEEC) has also drawn attention to the need for support after the introduction of local curricula and stressed that EDUFI should ensure its adequacy.[37] According to the audit findings, the completion of the core curriculum did not eliminate the education providers' need for information and support, especially when the reform was very thorough and broad-based competence areas and future competence needs were introduced as new subjects to be taught. In addition, the different grades introduced the radically changed curriculum in stages between 2016 and 2019, and therefore the need for support did not end in 2016.

One of the reasons for the end of support after the reform of 2014 was that the unit that had been responsible for the preparation and implementation of the core curriculum for basic education was assigned the task of preparing a core curriculum for general upper secondary schools as soon as the core curriculum for basic education had been completed. The new core curriculum for general upper secondary schools entered into force in 2019. An interview with EDUFI's officials revealed that the new big project, which began immediately after the previous one, made it difficult to support the implementation of the previous project.

In the questionnaire survey, further clarification was requested from those education providers, principals and teachers who indicated that the lack of EDUFI's guidelines was one of the reasons hampering the promotion of competence needed in the future. The responses highlighted primarily the inadequacy, ambiguity and grandiosity of steering and guidelines. The respondents found the targets too grandiose to be implemented in teaching.

The steering by EDUFI has also been vague in connection with the partial updates of the current core curriculum for basic education. The latest partial update was related to the sections on pupil evaluation in the core curriculum for basic education, and it was to enter into force during the school year 2020–2021. Based on the interviews with education providers, the audit reached the conclusion that the steering performed by EDUFI in connection with the partial update has been vague: for example, the final decisions have not been delivered to all education providers on time so that the implementation could take place on schedule. This has caused extra work in municipalities. For example, municipal boards have had to deal with the matter several times, as EDUFI has provided information slowly and changed its guidelines as the matter has progressed.

The mastering of competences needed in the future is promoted in education, but major differences in competence raise concerns

According to the survey targeted at education providers, principals and teachers, future competence needs are included in local curricula primarily as mandatory subject matters to be taught. One of the questions in the survey was "Have the six above-mentioned competence needs been specified in the local curriculum as subject matters to be taught in such a manner that they oblige you in your job?" The proportion of "yes" responses ranged from 86% to 98%, depending on the respondent's professional status and the competence need. In addition, the respondents were asked about their opinion on the statement that "our school succeeds in efficiently promoting future competence needs" (Figure 16). Based on the responses, the majority of the respondents are of the opinion that the school's efficiency in promoting the competence needs is good or satisfactory. The majority of the respondents gave their school's efficiency the grade 8, and there were no significant differences between different professions (the average varied between 7.8 and 8.1, depending on profession).

In its report 2020, the National Education Evaluation Centre also stated that the development and implementation of broad-based competence areas in basic education are off to a good start, but the different actors in education have a different understanding of their objectives and significance.[38]

FIGURE 16:
Principals', teachers' and education providers' assessment of how the school has succeeded in promoting future competence needs. Grading scale 4–10 (4 = fully disagree, 10 = fully agree). The total number of respondents was 604.

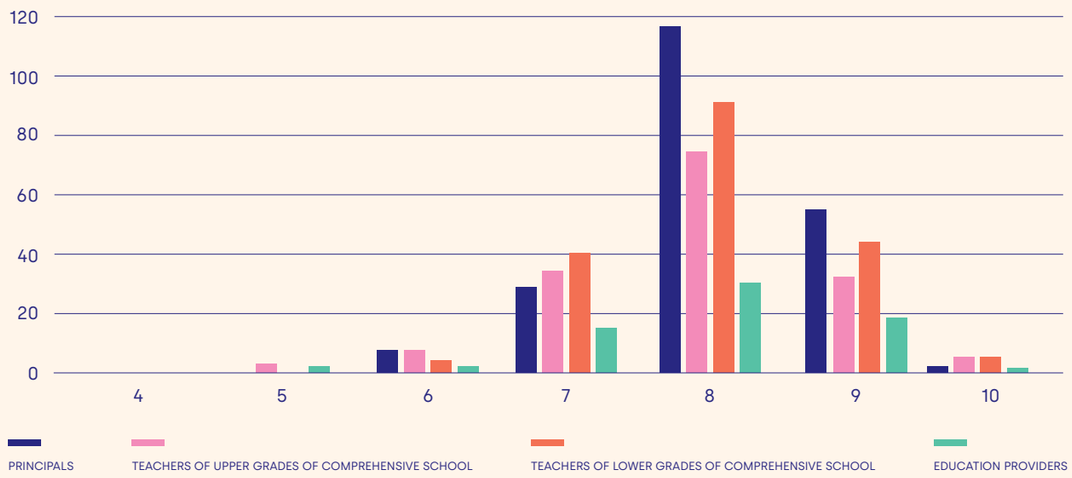
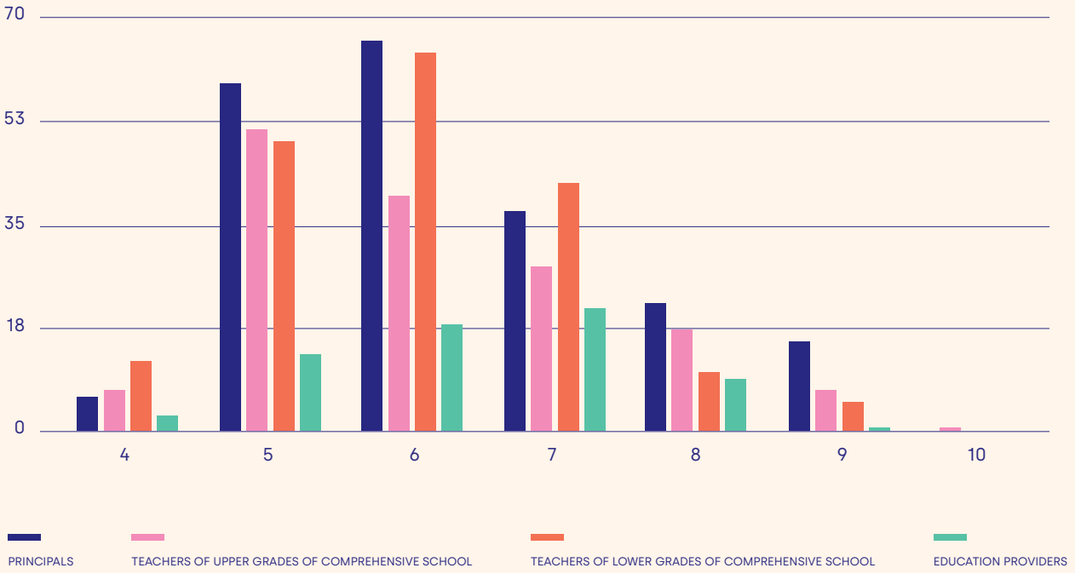
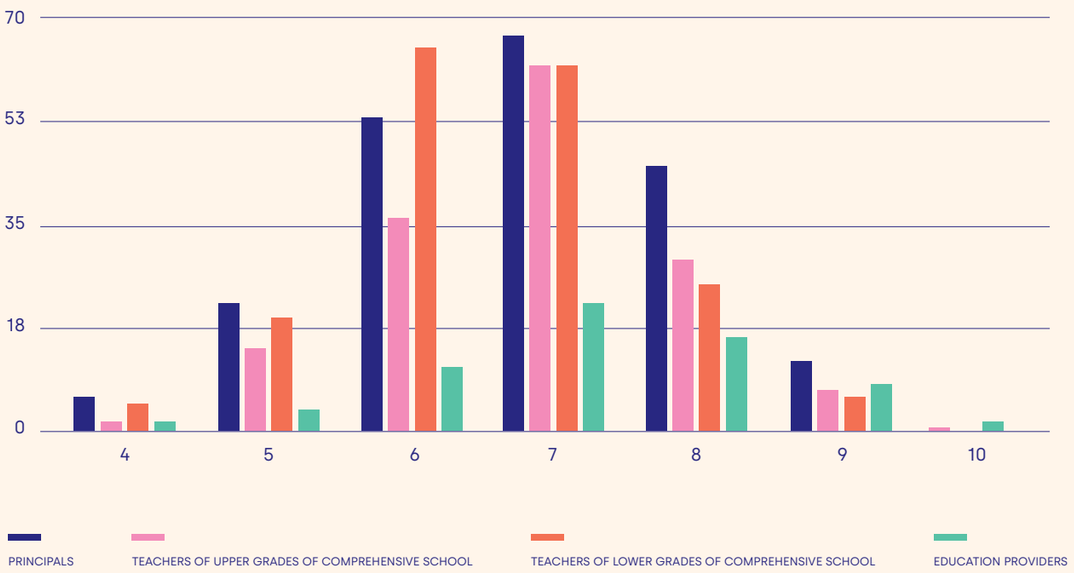


FIGURE 17:
Principals', teachers' and education providers' assessment of the statement that "there are no significant differences between pupils in the mastering of competence needs". Grading scale 4–10 (4 = fully disagree, 10 = fully agree). The total number of respondents was 603.



Based on the responses given by education providers, principals and teachers, schools have succeeded in promoting future competence needs efficiently in teaching. However, the same respondents only gave a passable grade, on average, to the statements that "there are no significant differences between pupils in the mastering of competence needs" and "there are no significant differences between schools in the mastering of competence needs". There were no significant differences in the opinions based on whether the respondent was a teacher, a principal or a representative of the education provider. (Figures 17 and 18.)

FIGURE 18:
Principals', teachers' and education providers' assessment of the statement that "there are no significant differences between schools in the mastering of competence needs". Grading scale 4–10 (4 = fully disagree, 10 = fully agree). The total number of respondents was 603.



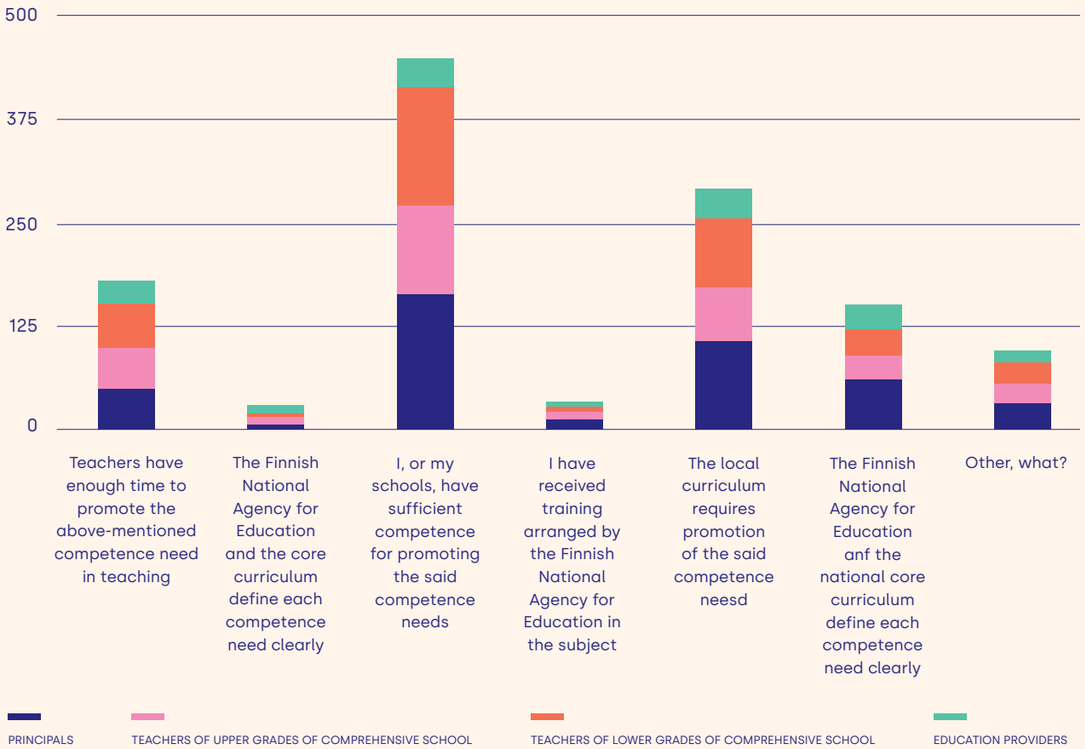
The open responses given to the survey revealed that the respondents found several reasons for the differences between schools and pupils. On the one hand, the major differences in the initial skill level are considered to be impacted by major differences in pupils' socio-economic and ethnic backgrounds. On the other hand, differences are also seen in school priorities: some schools place more emphasis on future competence needs in teaching than others.

On the other hand, several respondents referred in their open answers to the lack of teacher training and to unclear guidelines as regards the promotion of competence needs.

Success in promoting future competence needs relies on the professional skills of teachers and education providers; the biggest problem is lack of time

As the most important factors facilitating the promotion of future competence needs, the respondents highlighted the competence of the respondent or the school staff, as well as the fact that the local curriculum requires the promotion of the competence needs (see Figure 19).

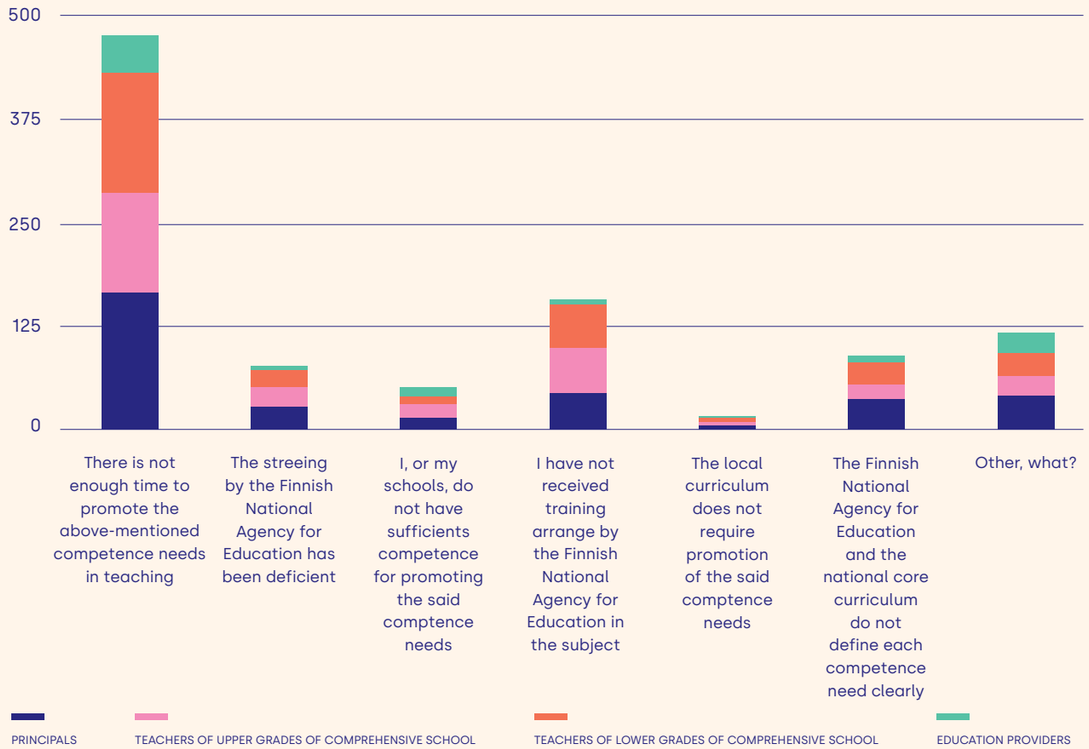
FIGURE 19:
Principals', teachers' and education providers' view on the factors that have facilitated the promotion of future competence needs. The respondents could select several different factors. The total number of respondents was 604, and they made 1234 selections in total.



The second most important factors were the following ones, which were found equally important: "there is enough time in teaching to promote these competence needs" and "the Finnish National Agency for Education and the core curriculum define each competence need clearly".

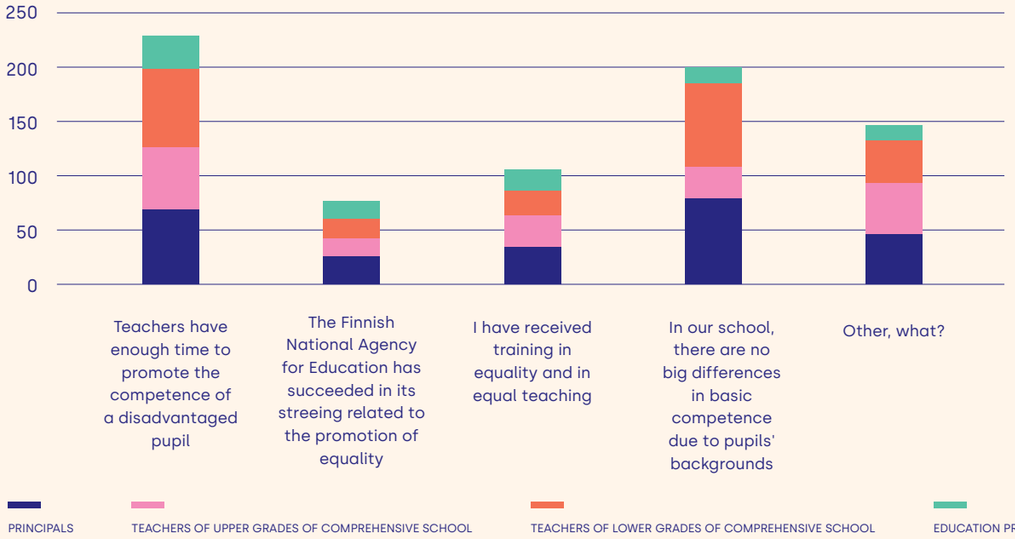
The promotion of the competence needs is considered to rely mainly on local competence, and EDUFI's steering is not considered to play an important role. This increases teachers' need to develop and maintain their competence on their own initiative. On the other hand, the audit interviews clearly revealed the problems of continuing teacher training: the participants are people who have already been actively developing their own competence. Those who should participate in the training easily fail to do so.

FIGURE 20:
Principals', teachers' and education providers' view on the factors that have hampered the promotion of future competence needs. The respondents could select several different factors. The total number of respondents was 604, and they made 842 selections in total.



According to all groups of respondents to the survey, the promotion of the competence needs is hampered mainly by lack of time, which received 46%–51% of all responses given in all groups of respondents (Figure 20). The issue was also raised in the interviews with education providers: the interviewees reported that teachers spend a large part of the time allocated for teaching to solving various challenges arising from pupils' behaviour. The Finnish Education Evaluation Centre has also paid attention to the fact that one of the main obstacles to achieving the content-related objectives of the curriculum is haste.[39]

FIGURE 21:
Principals', teachers' and education providers' view on the factors that have facilitated equal promotion of competence needs. The respondents could select several different factors. The total number of respondents was 604, and they made 766 selections in total.

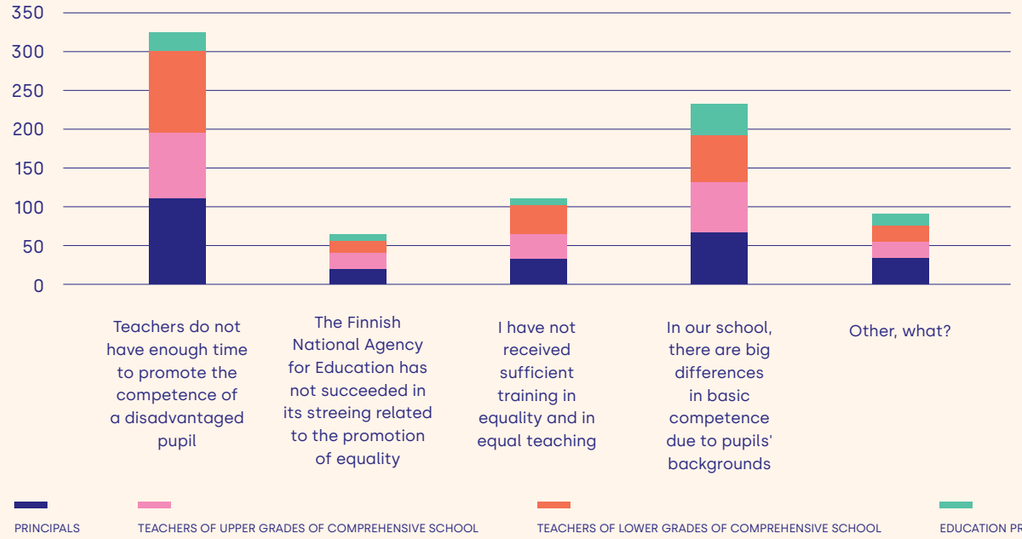


Equal promotion of competence needs is hampered by lack of time and major differences in the initial competence level due to pupils' background

The survey also aimed at examining what factors have hampered equal promotion of the competence needs in teaching (Figure 22). Two explanatory factors proved to be particularly significant: lack of time in teaching and major differences in basic competence due to pupils' background. The third most important factor was that the respondent had not received sufficient training for equal promotion of the competence needs. The fourth most important factor was the answer option "other".

The other reasons highlighted in the open answers were reasons related to the school's resource situation, such as difficulties in obtaining substitutes, large group sizes, inappropriateness of premises and shortage of specialist teacher resources. Secondly, the open answers also highlighted reasons related to the curriculum and its ambition level: the curriculum is considered to be too extensive and challenging to be implemented in hectic teaching. Thirdly, the responses emphasized reasons related to the school culture: the promotion of the competence needs is not as strongly part of the operating culture in all schools, and all teachers do not necessarily even have the competence to promote these skills. In addition, the school's everyday life is considered to be so busy that the promotion of the competence needs remains secondary.

FIGURE 22:
Principals', teachers' and education providers' views on the factors that have hampered equal promotion of the competence needs. The respondents could select several different factors. The total number of respondents was 604, and they made 819 selections in total.



Assessment of the broad-based competence areas and future competence needs has proved challenging

There have been challenges in the assessment practices of the skill-based curriculum. The aim was to make the core curriculum that entered into force in 2014 skill-based instead of knowledge-based. Skill-based means that instead of setting targets only for subject-specific knowledge, the curriculum also sets targets for more general, broad-based competence areas, including some of the future competence needs identified by the OECD.

The core curriculum of 2014 instructs teachers to assess not only pupils' subject-specific knowledge but also how they master the objectives of the broad-based competence areas. The audit interviews revealed that the assessment of the broad-based competences and future competence needs has been found to be very challenging. In the previous core curriculum of 2004, the assessment of the broad-based competence areas and future competence needs did not play a significant role. Instead, the assessment focused on the knowledge that the pupil had demonstrated in a subject. The Finnish Education Evaluation Centre has also stated that the assessment of learning, working skills and broad-based competence as a whole is a challenging task for teachers (FINEEC 2019). The interviewees emphasized that measuring generic skills has been found to be very difficult compared with measuring subject-specific knowledge, which has long traditions and more established operating models.

KEY RECOMMENDATIONS

1. The Ministry of Education and Culture and the Finnish National Agency for Education ensure that, when the national core curriculum for basic education is updated in the future, education providers are provided with adequate and consistent support for its implementation even after the completion of the local curriculum.

2. The Ministry of Education and Culture and the Finnish National Agency for Education improve the conditions for cooperation between education providers, for example by further developing practices and digital tools that enable the education providers to share good practices in the preparation, implementation and monitoring of local curricula.

3. The Finnish National Agency for Education develops, in cooperation with the education providers, a model for monitoring the implementation of local curricula to support the consistency of the implementation of the core curriculum for basic education.

oliveromg / Shutterstock.com

ISRAEL BASIC WORKFORCE INDICATORS[40]

POPULATION SIZE (2018):

8.9

MILLION

DEMOGRAPHY, ECONOMY, EMPLOYMENT

WORKING AGE POPULATION (2018):

60%

OF POPULATION

GDP (2019):

41,964$

US/CAPITA

EMPLOYMENT RATE (2019):

68.9%

OF WORKING AGE POPULATION

LABOUR FORCE PARTICIPATION RATE (2019):

80.4%

OF 25-64 YEAR OLDS

LABOUR PRODUCTIVITY (GDP PER HOUR WORKED - 2019):

42.26$

US

SHARE OF JOBS AT HIGH RISK OF AUTOMATION OR SIGNIFICANT CHANGE (2019)

44.8%

PART-TIME EMPLOYMENT RATE (2019):

15.1%

OF EMPLOYMENT

SELF-EMPLOYMENT RATE (2019):

12.3%

OF EMPLOYMENT

EDUCATION, TRAINING, SKILLS

TERTIARY LEVEL EDUCATION (2019):

50.2%

OF 25-64 YEAR-OLDS

ADULT PARTICIPATION RATE IN FORMAL AND/OR NON-FORMAL EDUCATION AND TRAINING (LAST 12 MONTHS - 2015):

53%

OF 25-64 YEAR-OLDS

LITERACY (ADULTS - PIAAC)

62%

AT PROFICIENCY LEVEL 2 OR BELOW (OF 5)

NUMERACY (ADULTS - PIAAC):

63%

AT PROFICIENCY LEVEL 2 OR BELOW (OF 5)

PROBLEM SOLVING IN TECHNOLOGY RICH ENVIRONMENT (ADULTS - PIAAC):

62%

AT PROFICIENCY LEVEL 1 OR BELOW (OF 3)

READING PERFORMANCE (15 YEAR-OLDS - PISA):

52%

AT PROFICIENCY LEVEL 2 OR BELOW (OF 6)

MATHEMATICS PERFORMANCE (15 YEAR-OLDS - PISA):

55%

AT PROFICIENCY LEVEL 2 OR BELOW (OF 6)

SCIENCE PERFORMANCE (15 YEAR-OLDS - PISA):

56%

AT PROFICIENCY LEVEL 2 OR BELOW (OF 6)

COLLABORATIVE PROBLEM SOLVING PERFORMANCE (15 YEAR-OLDS - PISA 2015):

42%

AT LEVEL 1 OR BELOW (OF 4)

ISRAEL
BASIC WORKFORCE INDICATORS

POLICY

Government departments in charge of education and employment policy: Education: Ministry of Education; Council for Higher Education. Employment: The Labour Branch in the Ministry of Economy and Industry; Israeli Employment Service.

Public expenditure on active labour market measures (2017): 0.17% of GDP

Gross domestic spending on R&D (2019): 4.93% of GDP

MAIN TRENDS OR CHALLENGES

The Israeli labour market is part of a dual economy: on the one hand - many sectors suffer from significantly low labour productivity, and large population groups have low employment rates, earn low wages and hold low levels of basic skills. These groups include the ultra-Orthodox Jews and the Arab-Israelis (who together make up about 32% of the country's working-age population, a share that is expected to increase), population in the geographic periphery as well as Israelis of Ethiopian heritage (who make up about 1.5% of the working-age population).

On the other hand, the high-tech sector is the driving force behind Israel's economy, and is characterized by high productivity and high wages. However, the Arab-Israeli and ultra-Orthodox Jewish population are not adequately represented in the high-tech sector, and lately the sector has been suffering from a shortage of skilled workers.

Moreover, Students in the Israeli education system rank relatively low on the OECD PISA exams for 15 year-olds, which measure knowledge and skills in language, mathematics and science. PISA results also present significant disparities between children from high and low socio-economic backgrounds, and between ultra-Orthodox Jewish/Arab-Israeli children and others.

STRONG POINTS

Israel has an especially high percentage of academic degree holders - 37.6% of working-age adults, compared to a 30.4% OECD average. Before the outbreak of the COVID-19 pandemic, Israel had a very low unemployment rate (3.8% in 2019) and enjoyed positive trends in the workforce participation rate and in real salaries. Moreover, the inclusion of Arab-Israeli and ultra-Orthodox Jewish women in the workforce was improving.

The high-tech sector is the leading economic sector, responsible for 46% of Israel's exports. The high-tech sector employs about 9.2% of the country's workforce, and is characterized by innovation, technological progress, very high labour productivity and high salaries.

SUMMARY AUDIT REPORT 2

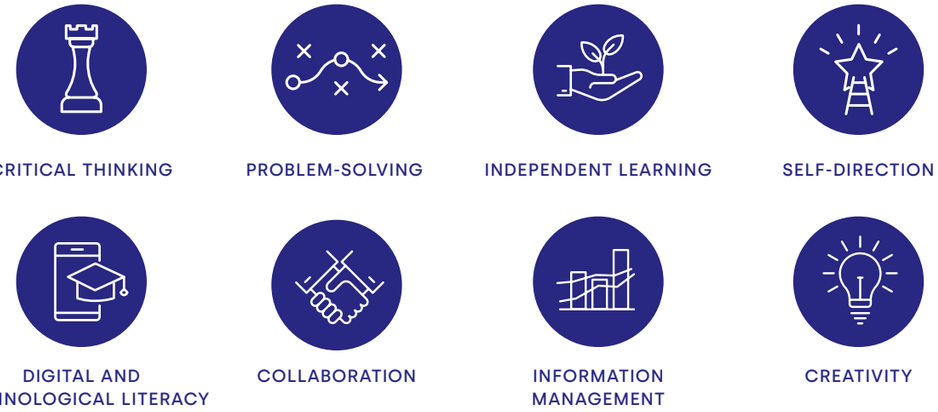
THE OFFICE OF THE STATE COMPTROLLER AND OMBUDSMAN OF ISRAEL

THE PREPAREDNESS OF THE ISRAELI MINISTRY OF EDUCATION FOR THE CHANGING LABOUR MARKET

BACKGROUND

In recent years, research points to new trends in the labour market, which will significantly alter some of the existing professions and jobs, make others obsolete, and give rise to new ones, within the next few years. In addition, technological innovations will require workers in nearly all sectors to adjust and update - in the changing labour market workers will increasingly need higher levels of education and cognitive abilities, as well as developed skills and competencies. Education researchers in Israel list 12 main skills required in the changing labour market of the 21st century:[41]

FIGURE 23:
Most essential skills for the 21st century[42]

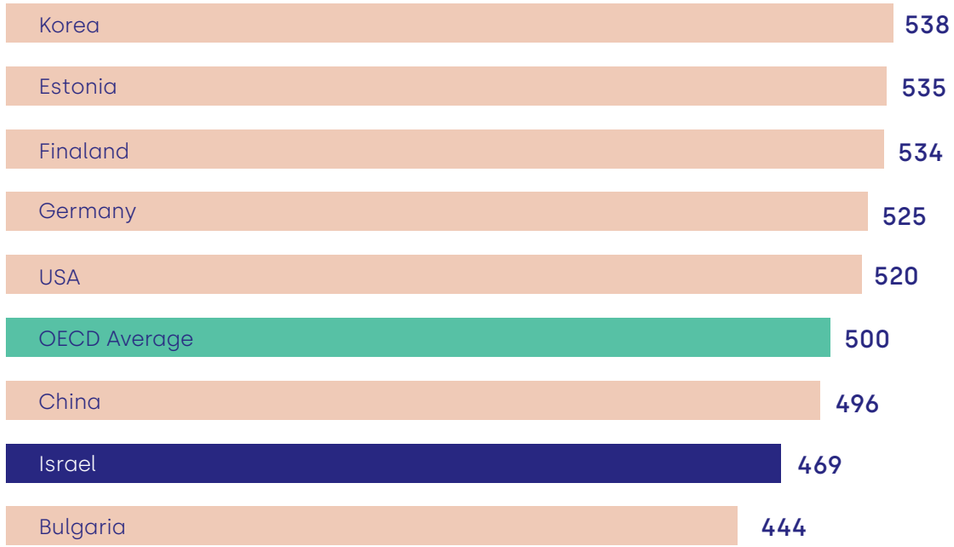


Source: Adapting Israel's Education System for the Challenges of the 21st Century

The skills of the 21st century were defined as a key challenge to the educational system also on the International level: one of the sustainable development goals adopted by the United Nations' General Assembly in 2015 is to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.[43] On this basis, the OECD developed the "Education 2030" framework,[44] later endorsed by the Israeli Ministry of Education. This project addresses, inter alia, the need to impart to students the knowledge, skills and values they will need in the future, and emphasizes disciplinary and inter-disciplinary knowledge, as well as epistemic and procedural knowledge;[45] cognitive and meta-cognitive skills;[46] social, mental, and practical skills; and personal, local, social and global values.

Thus, in recent years the OECD implemented some changes in the international exams it administers, in order to better examine the level of acquisition of 21st century skills. For example, the PISA 2015 survey[47] tested the skill of collaborative problem solving (teamwork) - which is a main requirement of workers in the current labour market, and in the HiTech sector in particular. The following figure presents the rating for this skill across a number of OECD countries:

FIGURE 24:
Average score in the 'collaborative problem solving' section of PISA 2015, Israel and selected countries

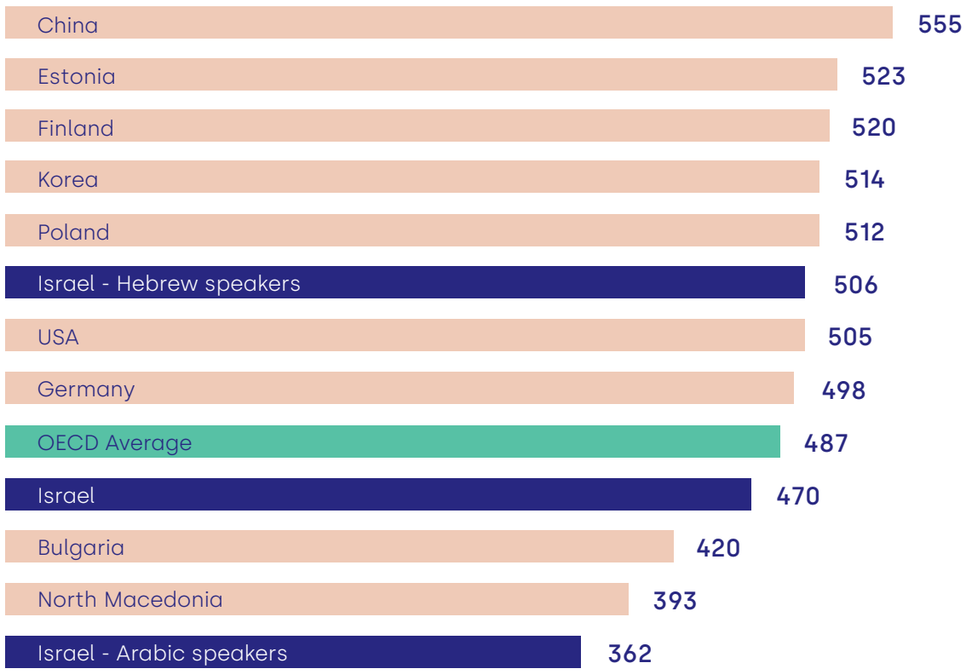


Source: OECD

On the collaborative problem solving section, Israel rated 34 out of 51 countries and economies which participated in the PISA 2015 survey, with an average score of 469, compared to an OECD average of 500.

The PISA 2018 survey addressed reading as its main subject, and the reading framework was devised to include essential reading skills in a digital world. It examined the combination of traditional reading methods and sources, with new literacy skills, relevant to the massive information flow of the digital era, which demands readers be able to distinguish between fact and opinion, detect biased information and malicious content, and navigate the technology-rich 21st century. The survey included digital reading from various sources, similar to internet browsing. The students were examined on skills such as determining the validity of texts, searching for information, and managing information stemming from multiple sources. The figure below presents the rating of scores across a number of OECD countries in PISA 2018:

FIGURE 25:
Average score in the 'reading' section of PISA 2018, selected countries and Israel - by mother tongue of students



Source: OECD

On the reading section, Israel rated 37 out of 77 countries and economies which participated in the PISA 2015 survey, with an average score of 470, compared to an OECD average of 487.

Moreover in a report on the pedagogical climate and environment for the school year 2018/19, carried out by the National Authority for Measurement and Evaluation in Education, many students in upper secondary schools reported they felt their schools are not preparing them for life (38%), and are not supplying them with the means to succeed in the labour market (37%). The shares were higher among Hebrew speakers and stronger socio-economic groups.

The success of the State of Israel in facing the challenges of the changing labour market will depend, to a great extent, on the preparedness of the education system, especially on providing the skills its graduates will require, from kindergarten to twelfth grade. The findings detailed below stress the need for the Ministry of Education to set policies and strategic plans, to be implemented throughout the education system, focusing on imparting relevant skills. Subsequently, updates are required in curricula, assessment methods, teaching practices, teacher trainings, and physical and technological environments to support skills.

KEY FIGURES

1,835,459

Students in grades 1 to 12 who studied in the education system from September 2019 to October 2020 - 20% of the population. 42% of all students are in secondary school (grades 7 to 12)

8

The number of skills that research indicates are essential in the 21st century. These include critical thinking, problem-solving, independent learning, self-direction, creativity, collaboration, information management, digital and technological literacy. This audit focuses on these skills

57

The number of skills mentioned in four policy papers prepared by MOE units in 2016-2019. These documents were not translated into a program with priorities

29-33

Israel's ranking in the international PISA surveys of 2015 and 2018 (respectively), out of 37 participating OECD countries

38%

Percentage of students in secondary schools who believe that their school does not train them for life, and does not provide them with the means they need to integrate into the workforce in the future[48]

10-11

Number of matriculation exams Israeli students are required to take to obtain a matriculation certificate. In other countries, the number of exams ranges from 2 to 5

67%

Percentage of secondary school principals who indicated in the State Comptroller's questionnaire[49] that they enjoy only a medium or lower level of pedagogical flexibility[50]

61%

Percentage of secondary school principals who indicated in the State Comptroller's questionnaire that, in their opinion, lower-secondary schools provide students with the skills they need at a low or medium level

AUDIT DETAILS

From January 2019 to March 2020, the State Comptroller examined the Preparedness of the Ministry of Education (MOE) in adapting the education system for the 21st century and in providing students with the skills they need to integrate into the changing labour market. The audit focused on lower-secondary schools (grades 7-9) and upper-secondary schools (grades 10-12). The audit also examined the process for formulating a policy regarding the required skills for 21st century students, and the adaptation of the pedagogical programs to provide these skills, including their integration into the curricula, measurement and evaluation methods, and the level of pedagogical flexibility granted to schools.

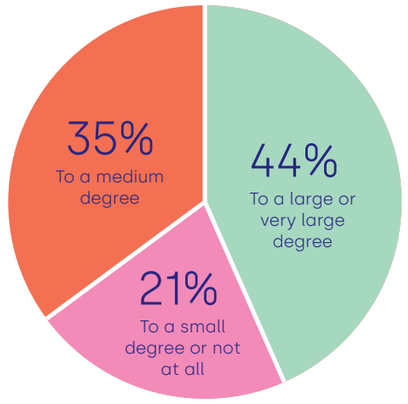
The audit was conducted at the MOE's units and in secondary schools across the country. Complementary audit actions were conducted in teaching research institutions. Furthermore, the audit included a comprehensive public participation process including all head supervisors, focus groups of subject coordinators, and students of 11 upper-secondary schools. A questionnaire was sent to 1,961 principals, with 757 responding (39%).

KEY FINDINGS

The "Meaningful Learning" reform: its influence and lesson learnt:

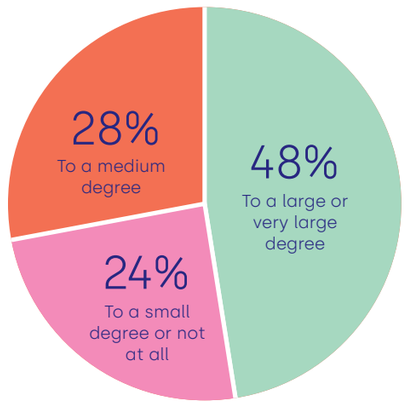
The implementation of this reform began in 2014-2015, and its purpose was to adapt the education system to the 21st century and provide students with the skills they need. Five years since the MOE began implementing the reform, half of the staff in secondary schools - head supervisors, principals, and subject coordinators - believe that this reform had little effect on advancing the provision of the 21th century skills to secondary school students. It was found that at the audit completion date, the MOE did not carry out a methodical and comprehensive process for drawing conclusions regarding the reform to be able to formulate a continuing policy for providing these skills.

FIGURE 26:
Distribution of responses of secondary school principals to the question: To what extent has the Meaningful Learning reform created a foundation for imparting 21st century skills?



Source: The State Comptroller's questionnaire

FIGURE 27:
Distribution of responses of head supervisors to the question: In the subject you supervise, to what extent have the changes made in the Meaningful Learning reform created a foundation for imparting 21st century skills?



Source: Audit vis-à-vis head supervisors

Comprehensive program for providing 21st Century skills:

From 2016 to 2019, different MOE units prepared policy papers on providing students with these skills. The policy papers indicated many and diverse required skills, and in fact 'spoke in different languages'. Moreover, the MOE did not use these documents to formulate a comprehensive program with objectives, priorities, means, and time-lines. As of October 2020, the Ministry had not yet completed (or regulated in the Director General's circular) the strategic work to define and implement the 21st century skills which the "optimal graduate of the education system" will need.

FIGURE 28:
The occurrence of skills in the various MOE policy papers

BY POLICY PAPER	SKILLS THAT APPEAR ONLY IN THIS PAPER (% OF ALL SKILLS IN THE PAPER)	SKILLS THAT APPEAR IN ANOTHER PAPER	SKILLS THAT APPEAR IN 2 MORE PAPERS	SKILLS THAT APPEAR IN ALL PAPERS
Future-Oriented Pedagogical Policy	10 (53%)	5 (26%)	3 (16%)	1 (5%)
Strategic Plan for 2017-2019	5 (46%)	3 (27%)	2 (18%)	1 (9%)
Mapping of the Pedagogical Secretariat	16 (55%)	10 (35%)	1 (7%)	1 (3%)
2nd Version Future-Oriented Pedagogical Policy	11 (58%)	6 (32%)	1 (5%)	1 (5%)

BY SKILL	APPEARS IN 1 PAPER	APPEARS IN 2 PAPERS	APPEARS IN 3 PAPERS	APPEARS IN ALL 4 PAPERS
All skills appearing in the policy papers	42 (74%)	11 (19%)	3 (5%)	1 (2%)

Source: MOE policy papers[31]

Participation of external stakeholders in the process for strategic transformation:

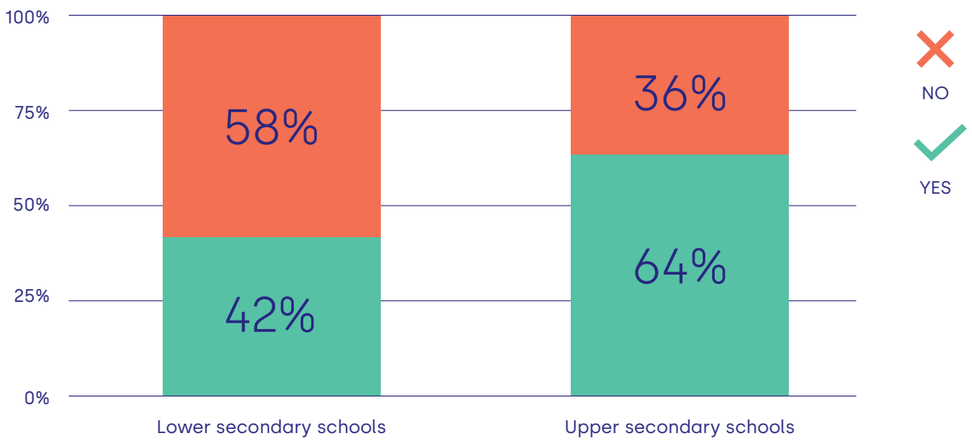
The audit found that external professional stakeholders were involved in the formulation of the future-oriented pedagogical policy paper. In the formulation of the strategic plan for 2017-2019, all main MOE units were involved. However, the process of formulating these policy papers did not include representatives of other government ministries, of the higher education system, or of statutory bodies that have an impact on the labour market and on the skills the market may require. At times, even stakeholders from the MOE's units were not involved in the process.

Mapping the curricula to assess the skills included in them:

The curricula of the various subjects is formulated by the head supervisors and the Pedagogical Secretariat. The curricula is binding for all schools. The curricula defines the disciplinary knowledge, as well as the goals, principles and skills to be achieved in learning the specific subject. It also includes the pedagogical guidelines for teaching the subject (including the order of topics to be learnt, and the number of hours to be dedicated to each). Research indicates that knowledge and skills should be imparted together, and are not to be regarded as separate learning processes.

The Pedagogical Secretariat mapped the curricula to assess the extent of implementation of skills in them. The mapping was conducted according to OECD guidelines, but only for a limited number of subject-curricula, and only in lower-secondary schools. It did not take into consideration compulsory subjects, the curricula of upper-secondary schools, and the head supervisors were not included in this process. The head supervisors conducted their own mapping, but 58% of them indicated that they did not map the curricula of lower-secondary schools, and 36% indicated that they did not map the curricula of upper-secondary schools. As a result, the status report conducted by the MOE regarding the required skills in the curricula is lacking.

FIGURE 29:
Share of head supervisors who performed Subject-curricula mapping, by type of school



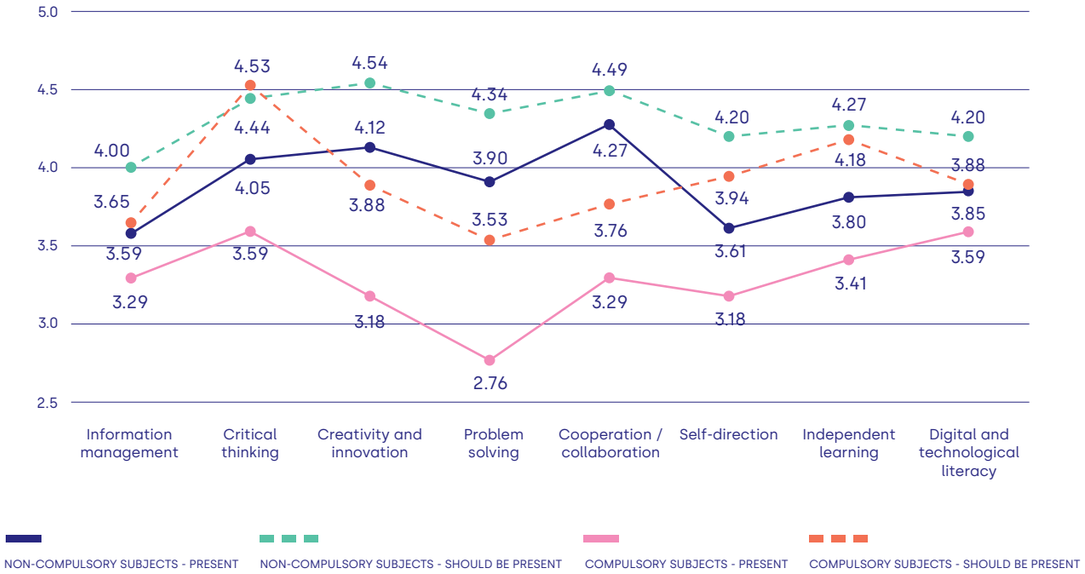
Source: Audit vis-à-vis head supervisors

Period for updating the curricula and adapting them to the "Meaningful Learning" reform:

Since the launch of the Meaningful Learning reform over five years ago, half of the curricula has not yet been updated, and the principles of meaningful learning were not integrated into them. According to the data of February 2020, 42 out of 82 curricula for secondary schools (51%) were last approved over ten years before, and have not been updated since.

The head supervisors (who are in charge of defining the curricula) and school principals and subject coordinators (who are in charge of teaching according to the curricula), all believe that 21st century skills are only partly present in the curricula. Some skills are entirely missing from the list of skills attached to curricula files, while these are the files that guide teachers and define the skills to impart in each subject in each age group. When curricula do not address the required skills, the MOE, the Pedagogical Secretariat, and the head supervisors have a limited ability to require teachers to impart 21st century skills within the subject they teach.

FIGURE 30:
Head supervisors mapping of skills - are they present in a subject-curriculum and should they be, by compulsory and non-compulsory subjects[52]



Source: Audit vis-à-vis head supervisors

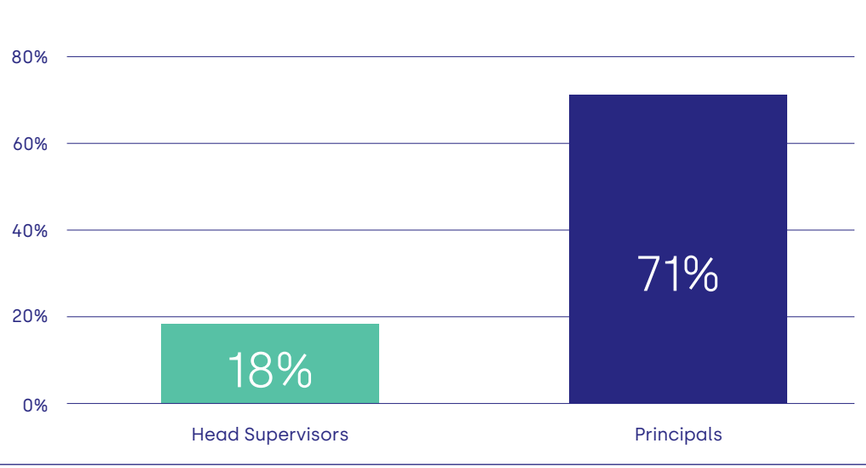
Implementation of skills and their assessment in the measurement and evaluation of students:

In the Israeli education system the external evaluation, specifically the matriculation exams, acts as a compass for the whole system. It also serves to set a comprehensive and all-encompassing policy, based on up-to-date information, and to lead system-wide changes - in the learning methods and goals. Thus, the external evaluation affects the internal evaluations, as well as the teaching methods and approaches in schools.

However, despite the fact that the international exams are changing, putting more emphasis on the evaluation of skills and less emphasis on the evaluation of knowledge, written matriculation exams in Israel (which today account for 49% of the students' final grade) almost do not refer to 21st century skills, and do not test them.

The matriculation exams, which require mostly memorizing of knowledge, are regarded by subject coordinators, school principals and students - as opposed to head supervisors - as an obstacle to imparting skills. The structure and features of the exams do not sufficiently encourage school motivation and ability to impart skills to students. In practice, schools find themselves limiting the learning process to only that content which is expected to appear on the exams.

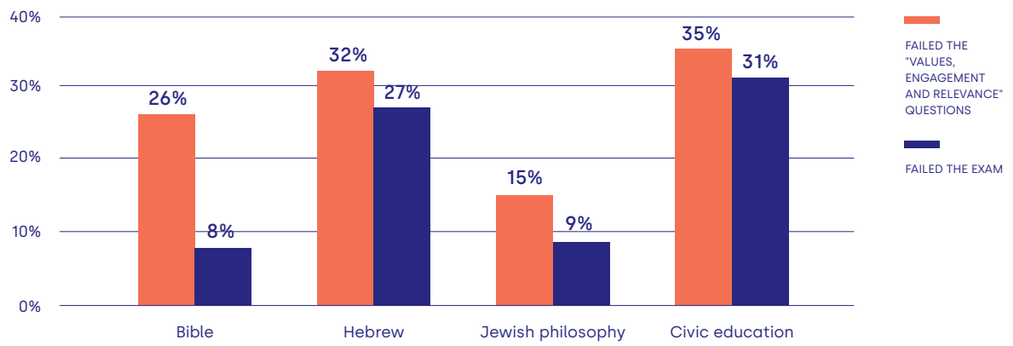
FIGURE 31:
Percentage of principals who responded that the matriculation exams hinder the teaching of skills to students to a large or very large degree, compared with the percentage of head supervisors who responded the same



Source: The State Comptroller's questionnaire

Changes that were made in matriculation exams in order to adapt them to the 21st century, did not achieve real change. For example, the MOE added to matriculation exams questions examining values, engagement and relevance, as well as questions of higher degree thought,[53] expecting to evaluate cognitive skills of deeper understanding. However, only limited use was made of such questions (5%-20%), and the percentage of students who answered them was small, as they are not compulsory (for instance in Civic Education, only 14% of students responded). Many of the students who did respond, did not do well on these questions.

FIGURE 32:
The rate of students failing the "values, engagement and relevance" questions (of those who answered), and the rate of students failing the exams on which they appeared

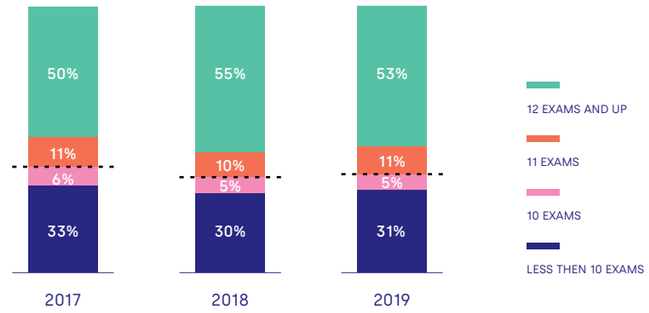


Source: The MOE

The number of matriculation tests in Israel:

Most students in Israel[54] are required to take 10 to 11 matriculation exams in order to obtain a matriculation certificate. In fact, many students take even more matriculation exams, with the encouragement of their schools and of the MOE.

FIGURE 33:
Distribution of schools by the average number of matriculation exams per student, 2017-2019



Source: the Exams Division, MOE. The black line represents the minimum number of exams required to obtain a matriculation certificate (percentages rounded).

The large number of exams in Israel (10 to 11 exams per student compared to 2 to 5 in other countries) creates a system that makes it difficult for schools to prioritize and invest in providing students with the skills they need. Thus, 69% of school principals stated that the burden of exams limits the ability to impart skills to students to a large or very large degree.

In the school-year 2014/15, according to the Meaningful Learning reform, secondary schools began using alternative assessments (including internal evaluation, aimed at replacing some of the written matriculation exams), and combined them in the learning programs. In some cases students could even replace the entire external exam with the alternative assessment. In addition, the MOE asked schools to limit the use of written exams and use alternative approaches to evaluation and assessment.

While the number of alternative assessments increased, this reform was confronted with many obstacles, including insufficient training to teachers on performing alternative assessments, many students per teacher, lack of motivation of teachers for the change, insufficient resources and teaching hours, etc. Therefore, the MOE is still unable to assess the level of skills students hold, needed to integrate into the changing labour market.

FIGURE 34:
Areas in which increased flexibility would have the greatest contribution to the ability to provide skills to students

CURRICULA

43%

of principals responded that curricula and teaching hours are the areas in which increasing the pedagogical flexibility would have the greatest contribution to the ability to provide skills to students*

IN PRACTICE

65%-75%

responded that they enjoy only medium flexibility or less. Most (66%) responded that "the burden caused by the compulsory program" limits to a large or very large degree their flexibility

MEASUREMENT AND EVALUATION

15%

of principals responded that measurement and evaluation are the areas in which increasing the pedagogical flexibility would have the greatest contribution to the ability to provide skills to students**

IN PRACTICE

69%

responded that they enjoy only medium flexibility or less.

INITIATIVES AND PARTICIPATION OF EXTERNAL STAKEHOLDERS

15%

of principals responded that Initiatives and participation of external stakeholders are the areas in which increasing the pedagogical flexibility would have the greatest contribution to the ability to provide skills to students

IN PRACTICE

65%

responded that they enjoy only medium flexibility or less

* 42% stated so in relation to choosing the teaching subjects; 19% stated so in relation to choosing in what grades to teach subjects and how many hours to allocate

** Among principals of upper-secondary schools, the percentage in this section was higher - 27%

Source: The State Comptroller's questionnaire

Pedagogical flexibility:

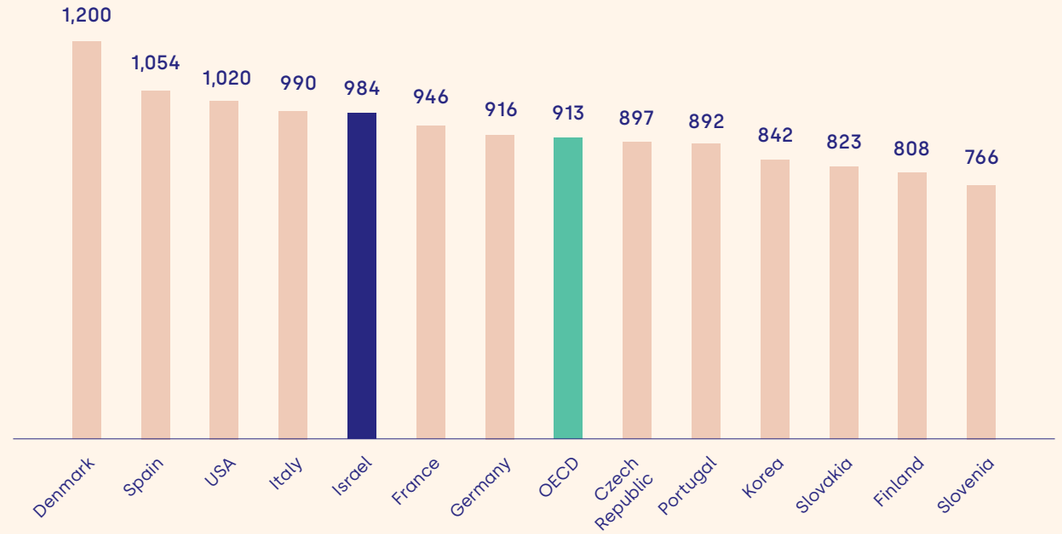
Pedagogical flexibility given to schools may have a great contribution to the way they will impart skills to students. However, in practice, the level of flexibility given to schools is low - 67% of principals who answered the questionnaire indicated that they enjoy a medium to low level of pedagogical flexibility. In areas in which principals believe that increased flexibility would have greater contribution to the ability to provide students with the skills, they find there is the least flexibility.

The role of lower-secondary schools and their ability to teach skills:

Only 18% of principals believe that from the MOE's perspective the main purpose of lower-secondary schools is to teach skills; 61% believe that, in actual fact, lower-secondary schools teach the required skills only to a limited or medium degree.

Studies showed that the Israeli education system focuses on the number of teaching hours, rather than on the quality of teaching. Indeed, Israel boasts a high number of teaching hours in lower-secondary schools when compared to other OECD countries.[55] However, research has proven no correlation between the number of hours taught and students' achievements, and even negative correlation at times.

FIGURE 35:
Number of teaching hours (yearly) in lower-secondary schools, Israel, OECD average and selected countries



Source: OECD, Education at a Glance, 2018

Despite the fact that the MOE began a process for adapting teaching approaches and methods in lower-secondary schools to the 21st century, including skills tutoring, the heavy load of multiple teaching hours and many subjects studied, and a high number of exams, does not comply with the OECD approach, which advocates teaching few subjects in a deep manner. The said load may affect the capacity of the education system to provide lower-secondary school students with the required skills.

Formulation of a policy by the MOE for teaching the 21st century skills:

In July 2019, the MOE began defining the skills required by students in the 21st century and started setting a schedule to include them in the curricula, and in the professional training for teachers.

Changes in matriculation exams:

The inclusion of questions about Values, Engagement and Relevance and higher degree thought in matriculation exams is an appropriate step. It seeks to express a skill that is based on an in-depth understanding of both knowledge and thinking. This step points to the potential of using external evaluations as a compass in the education system, and may contribute to the provision of essential skills throughout the learning effort.

KEY RECOMMENDATIONS

Formulating a comprehensive plan for imparting skills:

It is recommended that the MOE conduct a comprehensive process of drawing conclusions from the Meaningful Learning reform. It is also recommended that the MOE complete formulating the program for imparting the required skills to students utilizing these conclusions and working in cooperation with relevant external bodies in the fields of education, government, employment, and civil society. This should be done by establishing either a National Education Council or an ad-hoc forum to deal with the changing labour market. It is further recommended that this program be regulated in an obligating MOE document such as a Director General's circular, which should be distributed to all field factors and outline the skills required for students. At the same time, it should synchronize and describe the status of the policy documents prepared in recent years by the MOE units.

Mapping the curricula and implementing skills within their framework:

It is recommended that the MOE's Pedagogical Secretariat consider to expand the mapping of the curricula into a system-wide, in-depth, and comprehensive process covering all curricula (or, at least, the curricula of all compulsory subjects), in cooperation with the head supervisors. This will enable them to assess how the skills of the 21st century appear in each curriculum.

Changing the method of measurement and evaluation for improving skills acquisition:

It is recommended that the MOE evaluate the inclusion of 21st century skills in the current matriculation exams. The MOE should assess the high number of matriculation exams and its effect on the entire system. It is recommended that the MOE consult with relevant educational, government, employment, and civil society entities.

Increasing the pedagogical flexibility to improve the imparting of skills:

It is recommended that the MOE act to increase pedagogical flexibility according to its policy, to the extent and in the areas required, in a way that will improve the imparting of skills to students.

Defining the role of lower-secondary schools with an emphasis on imparting skills:

In addition to the MOE's appropriate initiative led by Pedagogical Secretariat and the Pedagogical Administration to shift the focus and learning approaches in lower-secondary schools and adapt them to the 21st century, it is recommended that the two entities complete the formulation of a policy regarding the unique and current role of lower-secondary schools in the education system. Emphasis should be put on imparting the required skills to students.

CONCLUSIONS

In order to prepare students to succeed in their future lives, in addition to imparting values and knowledge in various areas, the education system should also teach the skills students will need as adults in their social, personal, and professional lives in the 21st century. This is further reinforced by the fact that education systems around the world are working to implement such skills.

The findings of the audit indicate that in addition to preparing policy documents regarding the required skills and formulating a program for their implementation, there are deficiencies in both the planning and the policy, as well as in the operational implementation of the skills in the curricula. Deficiencies were also found in assessment and measurement methods, and in the level of pedagogical flexibility given to schools, in a way that makes it difficult for them to provide students with the required skills for the 21st century.

It is recommended that the MOE formulate a comprehensive policy and a strategic plan for imparting 21st century skills to students. The strategic plan should provide the framework to coordinated activity of all relevant MOE units. Inter alia, it should also include guidelines regarding ways to implement the skills in the curricula, measurements and assessment methods, methods for teaching the skills in lower-secondary schools, and the means to expand pedagogical flexibility in all secondary schools.

SUMMARY AUDIT REPORT 3

THE OFFICE OF THE STATE COMPTROLLER AND OMBUDSMAN OF ISRAEL

THE LEARNING ENVIRONMENT IN SECONDARY SCHOOLS AS THE INFRASTRUCTURE FOR PROVIDING 21ST CENTURY SKILLS

BACKGROUND

A learning environment is a physical space that enables different types of teaching; it combines up-to-date learning technologies and encourages student involvement. Numerous studies around the world found that an in-depth, long-term pedagogical change in schools requires a change in their environment as well. Therefore, changing the education system to adapt it to the 21st century and enabling schools to provide students with the skills they need, involve changing the physical and technological learning environment.

Redesigning of the learning space is one of the main challenges the modern education system faces these days. Recognizing the importance of adapting these spaces to innovative learning, the Ministry of Education (MOE) included in its five-year plan the objective of adapting the learning environment - both the physical and ICT (Information and Communications Technology) infrastructures - to meaningful learning.

This report presents the situation as of the beginning of 2020, before the COVID-19 pandemic outbreak. Towards the completion of the audit and due to the pandemic, the MOE formulated a procurement program to narrow ICT gaps in schools and to improve the digital infrastructures for remote learning.

KEY FIGURES

2,265

Number of secondary schools in Israel (including schools which comprise of both primary and secondary school ages).[56]

23%

Percentage of secondary schools[57] included in the MOE's ICT program at the end of 2018 (the program implements new ICT infrastructures into schools and upgrades old ones).

48%

Percentage of secondary schools[58] which had one computer per more than 10 students at the end of 2018.

50%

Percentage of secondary school principals[59] who believe that the digital learning environment in schools supports the provision of skills only to a medium or low degree (as of 2019).

52% & 62%

Percentage of secondary school principals who believe that the physical environment in their schools does not contribute to providing 21st century skills (52% of them believe so with regard to laboratories, and 62% believe so regarding the school buildings, classrooms, and innovative spaces).

1.5%

Of the new secondary schools that the MOE recognized the need to establish in the period 2016-2018 were established under the Innovative Education Institutions project (20 out of 1,291 schools).

1.5%

Percentage of classrooms out of the total classrooms in secondary schools that were upgraded for innovative learning (M21 project) between the years 2016-2019 (496 out of 32,756 secondary school classrooms existing in the 2017/2018 academic year).

1%

Share of schoolyards in secondary schools that were upgraded for outdoor learning (under the Outdoor Learning project) between the years 2016-2019 (19 out of 2,265 schoolyards).

AUDIT DETAILS

From January 2019 until March 2020, the State Comptroller's Office examined how Ministry of Education arranged to adapt the Israeli education system to the 21st century, and to provide students with the required skills in the changing labour market. The audit focused on lower secondary schools and upper secondary schools, examining, inter alia, whether the MOE encourages secondary schools to create a technological and physical environment that supports the teaching of the 21st century skills to students, and whether it provides them with relevant means for this purpose.

The audit was conducted in the main units of the MOE and in secondary schools across Israel. It included an extensive public participation process with head supervisors, as well as focus groups with subject coordinators and students of 11 secondary schools. In addition, a questionnaire was distributed to 1,961 secondary school principals; 757 principals responded (39% of all principals).[60]

KEY FINDINGS

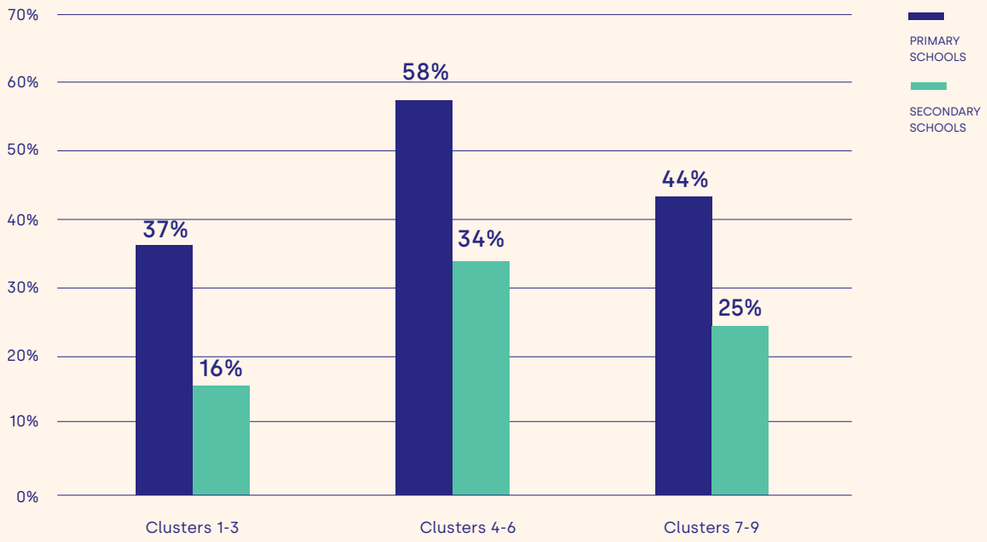
Implementation of the ICT program in secondary schools:

The ICT program that the MOE is operating in recent years focuses on implementing new ICT infrastructures in schools and upgrading old ones. The program operates mostly in primary schools, and in only 23% of secondary schools. The data refers to the period before the implementation of the procurement program due to the COVID-19 pandemic.

Implementation of the ICT program in lower socio-economic clusters:[61]

25% of secondary schools in the higher socio-economic clusters (7-9) participate in the program, whereas only 16% of secondary schools in the lower clusters (1-3) - that need this program - participate in it. The data refers to the period prior to the implementation of the procurement program due to the COVID-19 pandemic.

FIGURE 36:
Percentage of primary and secondary schools participating in the ICT program, by socio-economic cluster, 2018



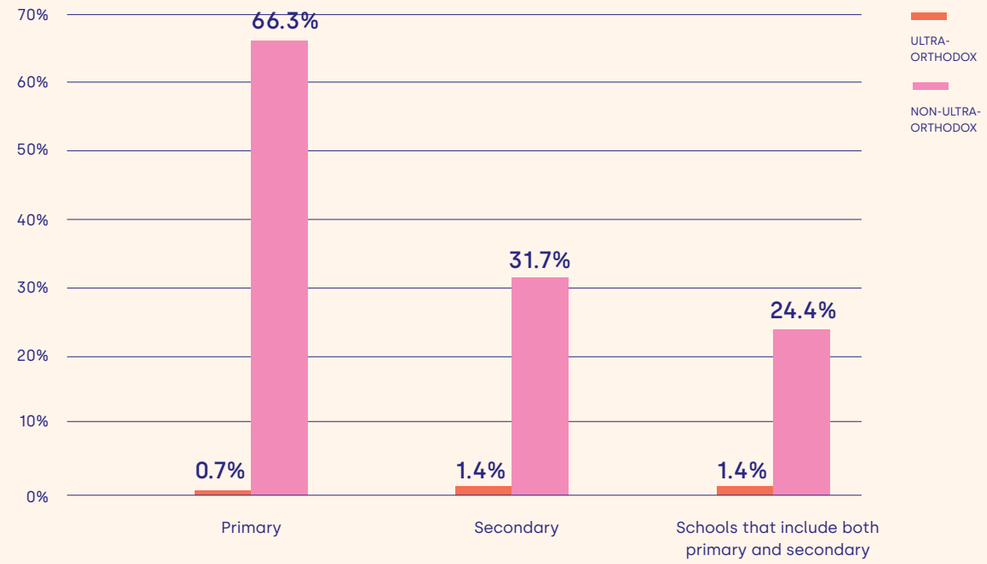
Source: data from the ICT Administration

Implementation of the ICT program in ultra-Orthodox schools:[62]

Schools in the State-Jewish education sector represent almost 50% of the schools that participate in the ICT program (whereas their percentage among all schools is 34%). Jewish ultra-Orthodox schools comprise only 1% of schools that participate in the program (whereas their percentage out of all schools is 30%).

For all school stages, the share of Jewish ultra-Orthodox schools which participate in the ICT program is very low. The gap compared to non-ultra-Orthodox schools is most apparent in primary schools: while about two thirds of all non-ultra-Orthodox primary schools participate in the program, less than 1% of ultra-Orthodox schools do so.

FIGURE 37:
Percentage of schools participating in the ICT programs, by stage and ultra-Orthodox affiliation, 2018

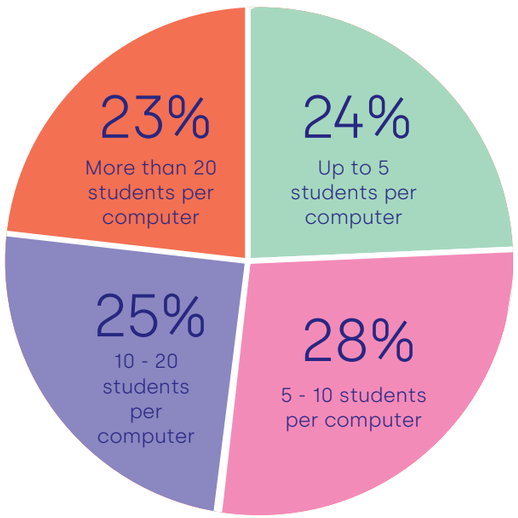


Source: data from the ICT Administration

Ratio of students per computer in secondary schools:

The MOE did not establish a standard for the reasonable ratio of students per computer in schools. 48% of secondary schools have one computer per more than 10 students, and 23% have one per more than 20 students.

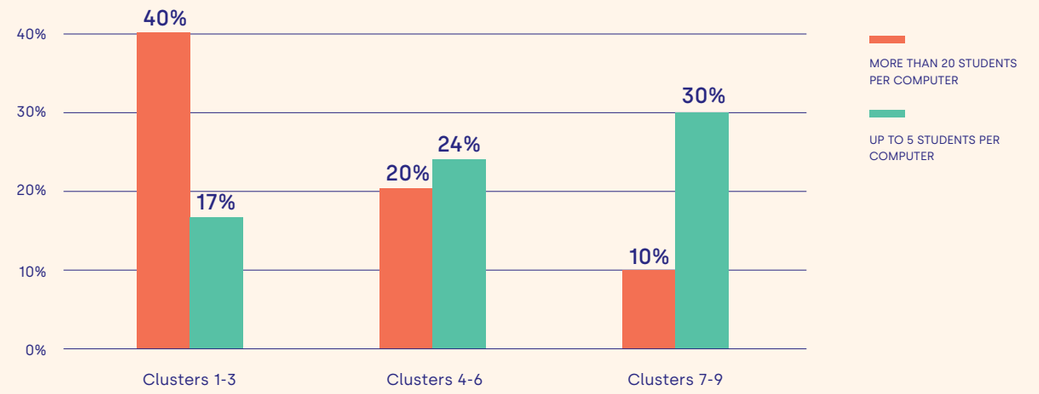
FIGURE 38:
Ratio of students per computer in secondary schools, 2018



Source: data from the ICT Administration

In higher clusters, 10% of secondary schools have a ratio of 20 students per computer, whereas this ratio is found in 40% of schools in the lower clusters.

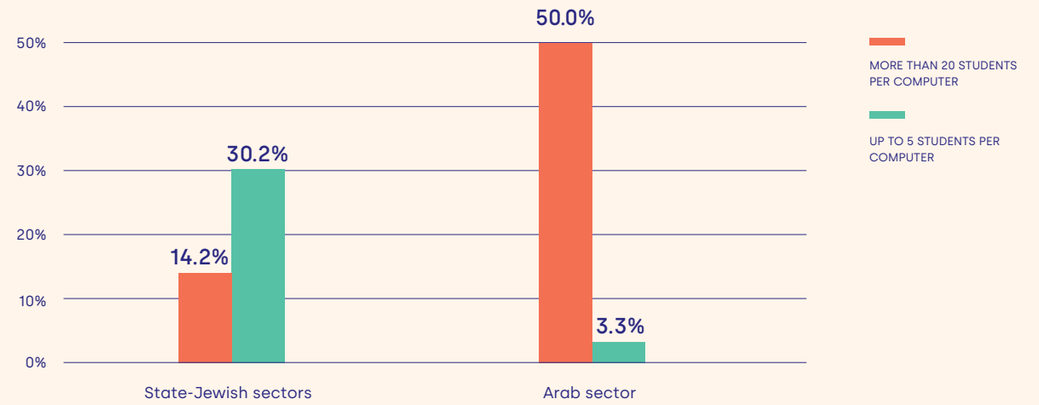
FIGURE 39:
Distribution of ratio of students per computer in secondary schools, by socio-economic clusters, 2018



Source: data from the ICT Administration

In State-Jewish education, 14% of secondary schools have a ratio of more than 20 students per computer, while this ratio is found in 50% of schools in the Arab education sector. All data refers to the period before the implementation of the procurement program due to the COVID-19 pandemic.

FIGURE 40:
Ratio of students per computer in secondary schools, by sector, 2018

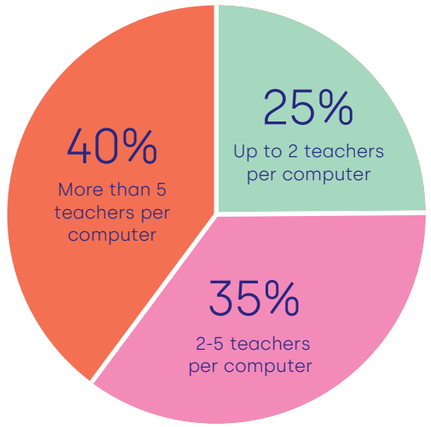


Source: data from the ICT Administration

Ratio of teachers per computer in secondary schools:

The rate of availability of computers to secondary school teachers is low. In 40% of secondary schools, there is one computer per more than five teachers.

FIGURE 41:
Ratio of teachers per computer in secondary schools, 2018



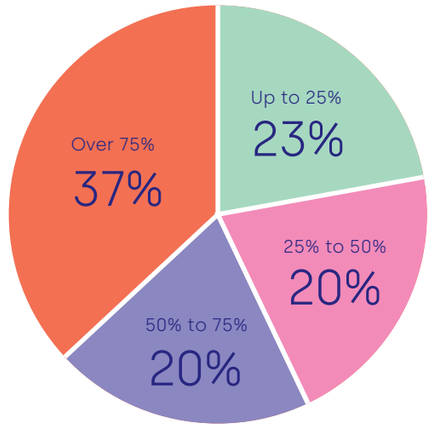
Source: data from the ICT Administration

In the lower clusters, the ratio of one computer per more than five teachers exists in 52% of schools. The data refers to the period before the implementation of the procurement program due to the COVID-19 pandemic.

Using an internet connection in secondary schools:

Almost a quarter of secondary schools used their internet connection to a low degree (up to 25% usage); 43% of schools do not use even half of their connection. Only about a third make use of their connection at a high level, and only 9% use it to the full. These figures point to significant potential in increasing digital learning in almost two thirds of schools.

FIGURE 42:
Rate of use of internet connection in secondary schools, 2018



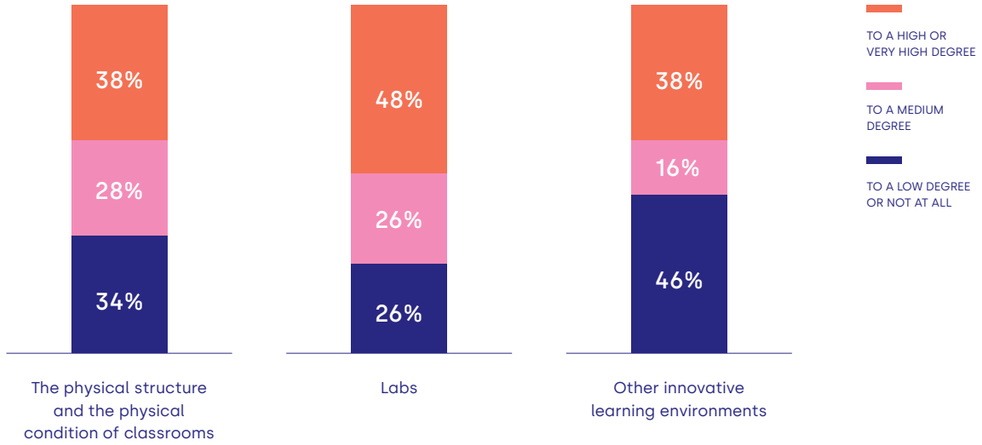
Source: data from the ICT Administration

Upgrading the physical environment in secondary schools:

The physical structure and environment of schools embody the educational approach of the MOE, and support both the pedagogical and the social needs in schools. Despite the importance of the physical environment and its potential contribution to imparting 21st century skills, Israeli teachers are far less content with the physical environment in schools than their counterparts in OECD countries, as is exhibited in the international TALIS survey.

In addition, most secondary school principals (52% to 62% of those who answered the questionnaire) responded that the physical environment in their school (which includes both the physical structure and the physical condition of classrooms, labs, and other learning environments) contributes to a medium degree or less to imparting 21st century skills.

FIGURE 43:
Principals' satisfaction with the contribution the various factors of the physical environment to skills



Source: the principals' questionnaire

FIGURE 44:
Minor differences between a classroom in the 1912 Herzelia Gymnasium in Tel-Aviv and a classroom these days

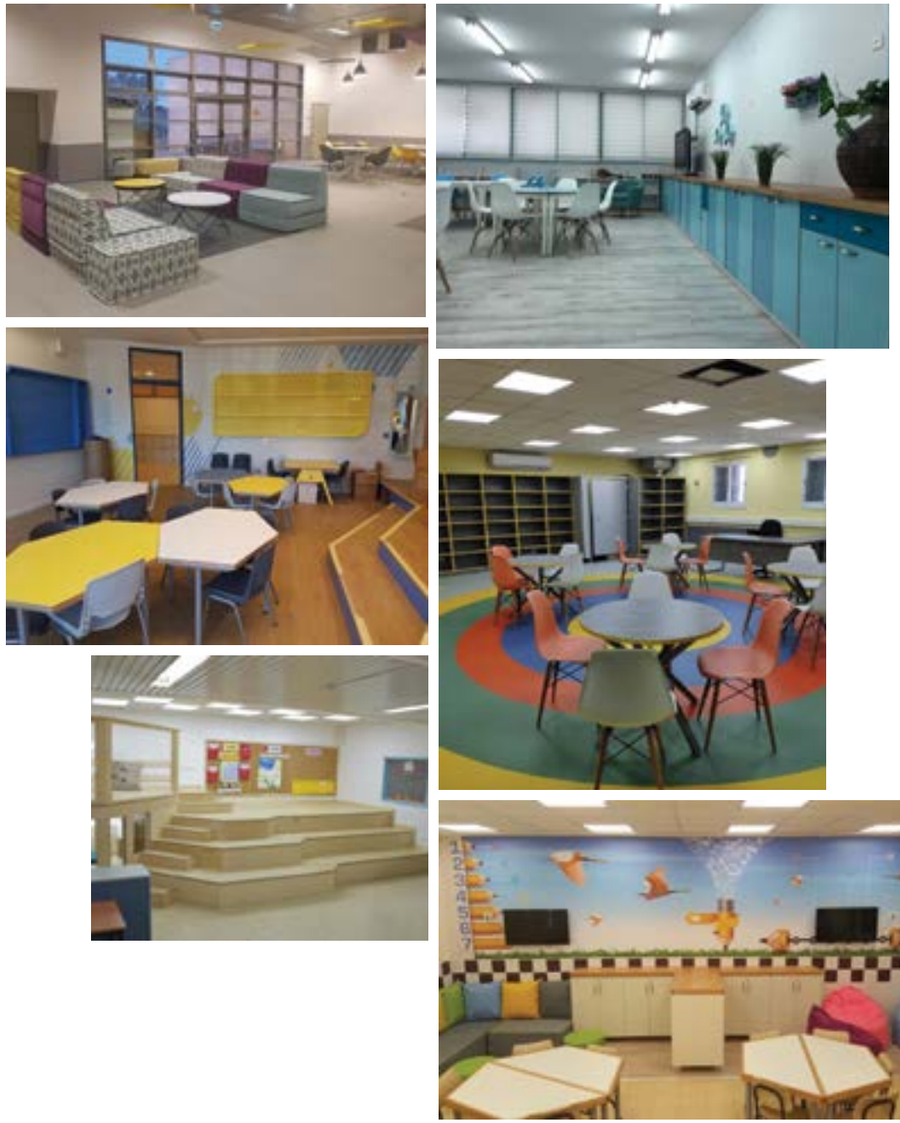
Source: "high-school" in Wikipedia.com; class4u.co.il

The MOE recognized the need to improve the physical learning environment in order to update it to the 21st century. It therefore started in recent years a number of projects that aim at creating innovative learning environments, inter alia in secondary schools. The MOE offered local authorities and schools to participate in its projects to upgrade the physical environment. The State Comptroller's Office examined three leading projects in this context: the project to erect Innovative Schools; the M21 project to build innovative classrooms in existing schools; and the Outdoor Learning project to design new yards for existing schools. The following figures present photos or simulations of environments that were built, renovated or upgraded in these projects:

FIGURE 45:
Photos or simulations of schools in the Innovative Schools project

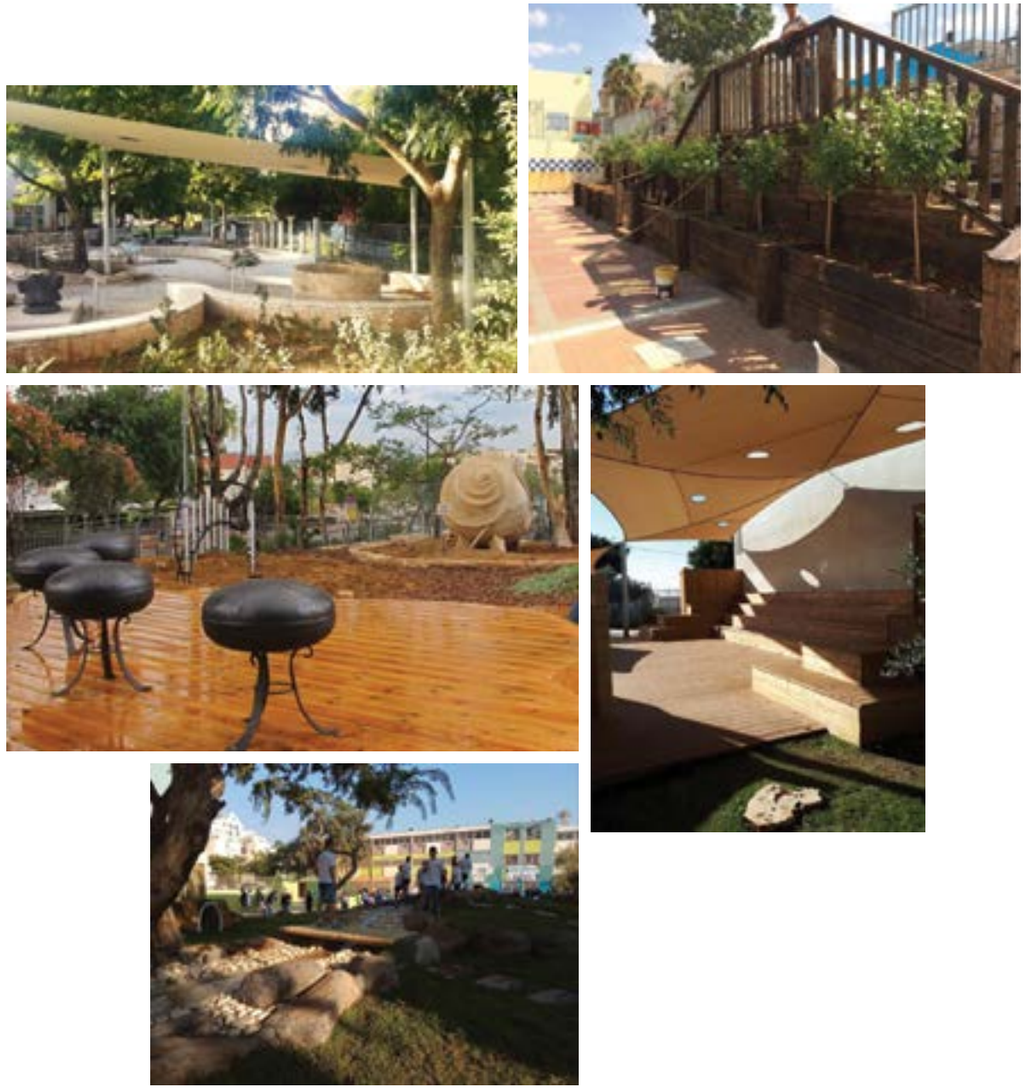
Source: The construction and development administration of the MOE

FIGURE 46:
Photos of classrooms in the M21 project



Source: The construction and development administration of the MOE

FIGURE 47:
Photos of Outdoor Learning yards in schools



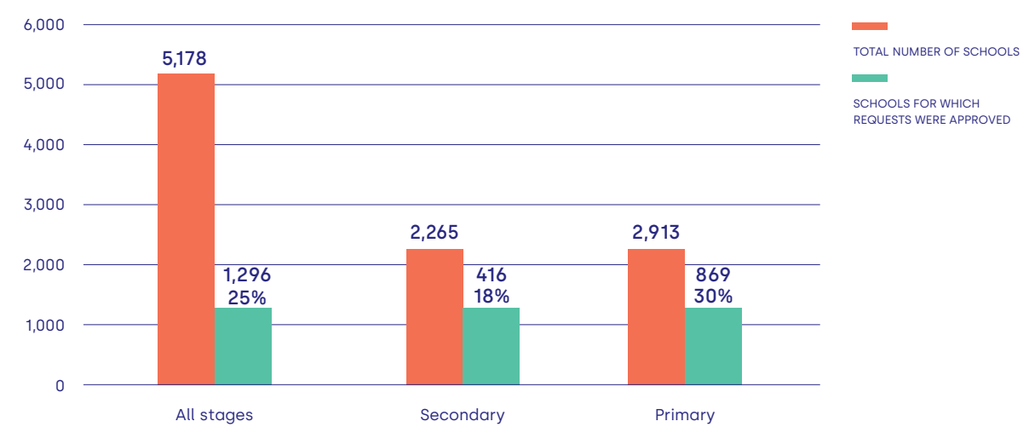
Source: The construction and development administration of the MOE

The percentage of secondary schools that participate in these projects is very low:

The Innovative Schools project: of the new innovative schools the MOE recognized it is required to build, only 1% were built between 2016 and 2018.

The M21 project: Between the years 2016-2019, as part of the M21 project for classroom improvements, the MOE approved the renovation of 55% of the requests submitted by local authorities (1,415 requests to renovate 1,522 classrooms were approved).only 33% of the approved requests were for classrooms in secondary schools. The result is that only 496 classrooms were approved for renovation in secondary schools, which represent 1.5% of all 32,756 classrooms in Israel.

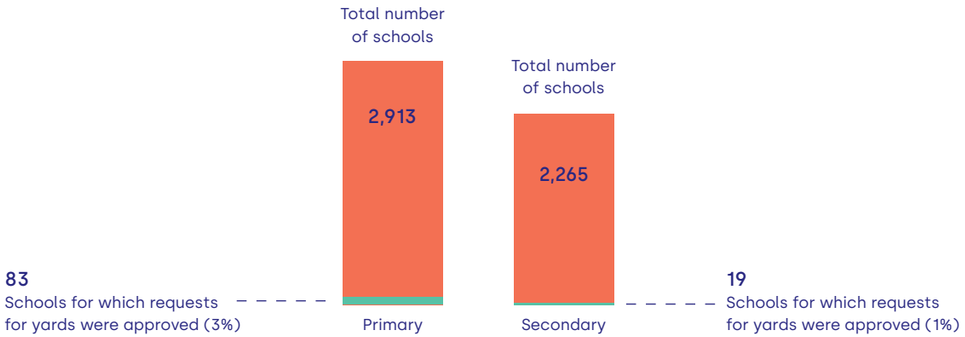
FIGURE 48:
Total number of schools in Israel, and number of schools for which M21 renovation was approved and funded, by stage, 2016-2019



Source: The construction and development administration of the MOE

The Outdoor Learning project: despite the advantages of outdoor learning, including in imparting 21st century skills, Israeli schools conduct most learning indoors. The Outdoor Learning project is meant to include outdoor spaces as optional learning environments, by planning and designing them to be in line with innovative pedagogical approaches. However, the MOE approved the construction of schoolyards under this project in 19 secondary schools, which constitute only 1% of all 2,265 secondary schools in Israel.

FIGURE 49:
Total number of schools in Israel, and number of schools for which Outdoor Learning yards were approved, by stage, 2016-2019



Source: The construction and development administration of the MOE

Accompanying research for projects to improve the learning environment:

The MOE did not perform accompanying research to support the projects. Moreover, there was no monitoring of the quality of the new schools built, the renovated M21 classrooms, the new learning schoolyards, and how these spaces contribute to innovative learning adapted to the 21st century. The MOE also failed to assess the level of satisfaction of the actors in the field, and the disadvantages and barriers of these projects.

Active actions to improve the physical learning environment in schools:

The MOE has been executing projects for improving the physical learning environment in schools since 2016. These projects include innovative educational institutions, M21 classrooms, and outdoor learning schoolyards, although the scope of these projects is limited.

Procurement program during the COVID-19 pandemic:

In its response of October 2020 to the audit's findings, the MOE indicated that it had formulated a procurement program during the COVID-19 pandemic of about NIS 1.2 billion. The aim of the program was to narrow the ICT gaps in schools and establish a digital infrastructure for remote learning.

KEY RECOMMENDATIONS

Including all schools in the ICT program:

It is recommended that the MOE complete the required procurement so that the schools obtain the technological and digital means they need, by including all schools in the ICT program. The program should focus on schools in the lower socio-economic clusters in order to give them essential tools to develop technological and digital skills among their students. Furthermore, in light of the COVID-19 pandemic that reinforces the importance of a comprehensive and quality technological and digital infrastructure as the foundation for remote learning, it is recommended that the MOE use the budget already allocated to implement a comprehensive plan for remote learning. The plan should include all schools in the ICT program, and the MOE should make efforts to reduce the shortage of laptops for students at home.

Define an appropriate ratio for students per computer and strive to achieve it:

It is recommended that the MOE define appropriate students per computer ratios taking into consideration the computing equipment available to schools (tablets, laptops, etc.), and complete the mapping of students' needs through a nationwide survey of available ICT infrastructures. Thereafter, it is recommended to update the data routinely so that it will be possible to continuously monitor the situation regarding this issue. It is also recommended that the MOE act within the current and future procurement plans to improve the students per computer ratio in schools in the lower socio-economic clusters and in Arab sector schools, in order to ensure adequate access to computers for every student in every school.

Adapt technological and digital infrastructures to provide students with the skills they require:

It is recommended that the MOE complete the upgrade of the technological and digital infrastructures in schools, including internet infrastructure, in order to impart technological and digital literacy to students. The COVID-19 pandemic and its repercussions on the education system indicates the importance of using the internet and the digital skills students require to use it effectively; and the capabilities already developed in this time of crisis should be further developed. Therefore, it is recommended that the MOE continue to monitor and ensure that the use of the internet and of digital skills continue to be effective, while adding the training and technical support required.

Formulate a comprehensive plan of projects for improving the physical learning environment, including studies that support these projects:

It is recommended that the MOE formulate long-term plans for projects of innovative educational institutions, M21 classrooms, and outdoor learning schoolyards. It is also recommended that the MOE improve the data available for these three important projects, supporting them with accompanying research for improvement and effectiveness. The MOE should also evaluate the possibility of increasing the number of secondary schools that participate in these projects, giving priority to schools in lower socio-economic clusters and in Arab settlements where the scope of innovative construction is low.

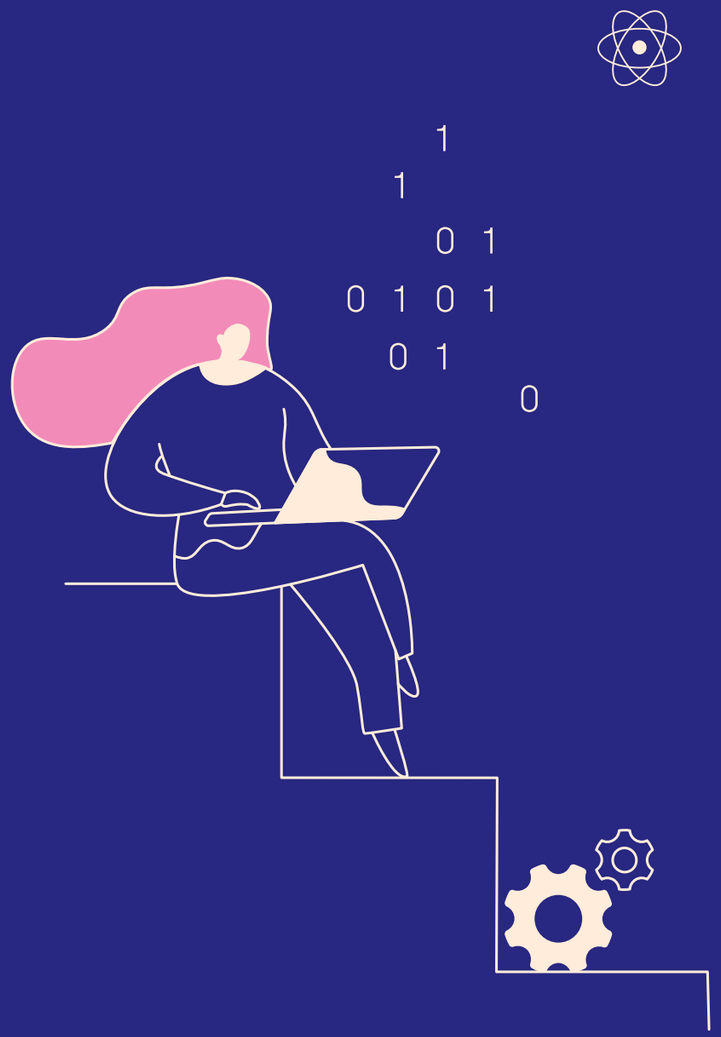
CONCLUSIONS

In order to prepare secondary school graduates for future success, and in light of the global engagement in this area, the education system must provide students with the skills they will need as adults in their social, personal, and professional lives in the 21st century.

The audit's findings show that on the eve of the COVID-19 pandemic at the beginning of 2020, the physical, technological and ICT environment of schools in general and secondary schools in particular did not provide optimum conditions for the effective acquisition of the of 21st century skills in general, and technological and digital literacy in particular. The availability of ICT learning resources to both students and teachers was low. The changes made to the physical environment in secondary schools were not sufficient to enable optimum innovative learning.

The COVID-19 pandemic further emphasized the importance of comprehensive, quality technological and digital infrastructures in schools. Such infrastructure should provide the essential foundation for remote learning. In this regard, it is worth mentioning the procurement plan the MOE prepared for the pandemic (as indicated in its complementary response of October 2020), to bridge ICT gaps and promote a digital infrastructure for remote learning.

It is recommended that the Ministry of Education utilize the budget allocated to it to implement a comprehensive program for remote learning and continue to act to improve the physical and technological learning environment. The MOE should also expand the number of schools that benefit from an innovative and effective learning environment and technological devices, and encourage schools (mostly secondary schools) to participate in projects that promote such environments. At the same time, it should work to remove barriers and take into consideration the gaps in schools of a lower socio-economic level, and in the ultra-Orthodox and Arab sectors.



2ND THEME:

02

VOCATIONAL TRAINING
AND ADULT LEARNING

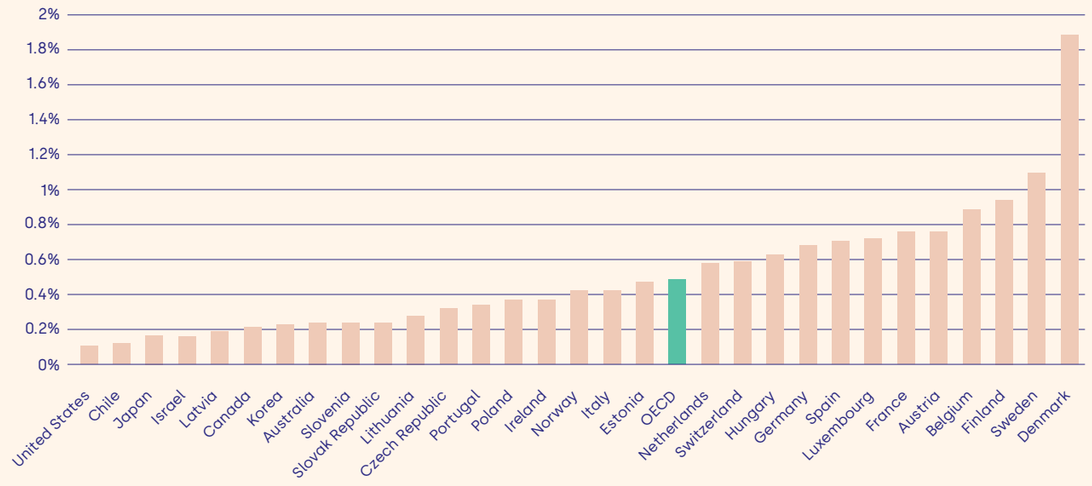
2ND THEME: VOCATIONAL TRAINING AND ADULT LEARNING

LifeLong Learning (LLL) is the primary means for adapting the skills of working-age adults to the demands of the changing labour market. Lifelong learning may enable workers to improve their employability and mobility, develop work-related skills and update their knowledge and competences. These upskilling efforts are often needed both in order to continue and advance at the same job or profession and to move to a new profession, whether out of choice or necessity resulting from labour market circumstances.

In light of the above, many countries have been updating the curricula and structure in their education systems and lifelong learning programs. For example, in recent years countries such as Korea, Germany, Norway, and Portugal have invested in improving vocational training and in constructing lifelong learning programs for imparting skills.[63]

Investment in Active Labour Market Policies (ALMP):[64] One channel for investing in the development of adult human capital is measured by investment in ALMP, which includes vocational and technological training, placement services (such as national employment services), transition programs between the education system and employment, programs for the unemployed and for people with disabilities. The following figure shows the investment made by OECD countries in ALMP:

FIGURE 50:
Public expenditure on ALMP as a percentage of GDP, OECD countries and OECD average, 2018



Source: OECD[65]

The significance of Lifelong learning for people with low levels of basic skills and low-wage workers: In view of the fast rate of change in the labour market, all workers could benefit from lifelong learning, but it is especially necessary for workers with low-level skills, in low-paying jobs, older workers, the unemployed, workers in non-standard employment,[66] and workers in jobs at a high risk of automation (i.e., that the role will become obsolete or change dramatically in the near future). Their need for support in learning is greatest, as they may not have the resources to participate in learning on their own, and thus may be rejected from the labour market or have their salaries eroded to poverty.

Studies and surveys from across the globe have shown that when employers invest in training their employees they usually train the high-performing employees, and not those whose jobs are at risk. They have also shown that those most in need of reskilling and upskilling are least likely to receive such training. These findings emphasize the importance of public investment in engaging low-skilled and low-waged workers in lifelong learning.[67]

Adapting the workforce to the demands of a changing labour market requires governments to update, adjust, and coordinate various systems: the vocational and technological education and training programs,[68] adult education programs for updating knowledge and upskilling, and the employment guidance and information systems.

SUMMARY AUDIT REPORT 4

THE OFFICE OF THE STATE COMPTROLLER AND OMBUDSMAN OF ISRAEL

ADAPTING LIFELONG LEARNING AND VOCATIONAL TRAINING FOR ADULTS TO THE CHANGING LABOUR MARKET

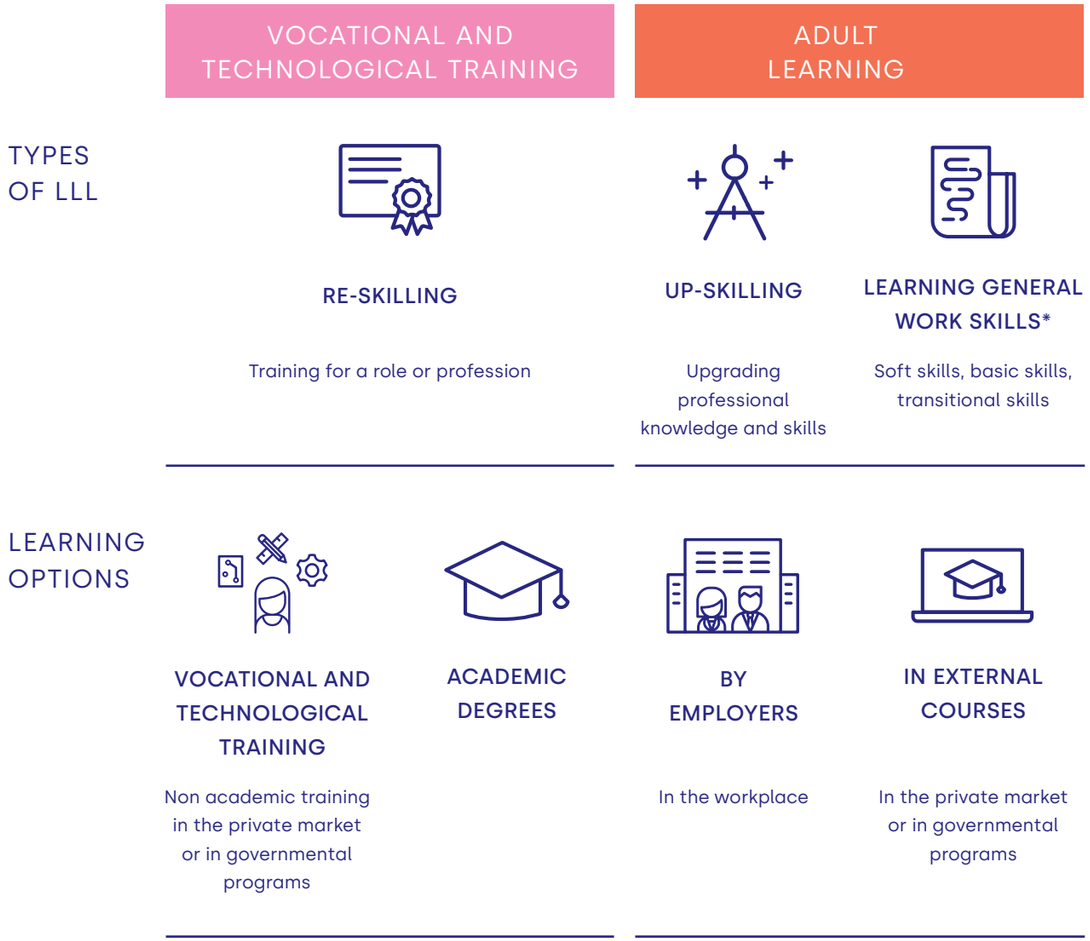
BACKGROUND

Labour markets around the world are changing profoundly, bringing about transformations in professions and in work-activities. In Israel, a large percentage of those jobs estimated to be at a high risk for transformation, are in sectors that employ nonacademic and low-skilled workers. These workers may become unemployed, as many of the jobs that require only basic skills may disappear.

In order to enable hundreds of thousands to integrate into, and remain part of, the workforce, there is a rising need to adapt the skills and knowledge of those entering the workforce - as well as of those already working - to the needs of the changing labour market; The need is particularly acute for low-skilled workers. Updating skills is necessary in light of the increasing demand for skilled workers, even in nonacademic professions, and as Israel holds a high percentage (in international comparison) of adults with low basic skills,[69] particularly among the Jewish ultra-Orthodox and Arab populations, and among other people of low socioeconomic status; Due to market failures, they might find it difficult to upgrade their skills without assistance.

The adaptation of competencies and skills,[70] which will improve the employability of workers, is achieved through "lifelong learning" – various learning and training activities performed in the context of employment, including vocational and technological training (for reskilling) and adult learning (for upskilling).

FIGURE 51:
The components of LifeLong Learning



* Soft skills: e.g. teamwork, time management, leadership, independent learning.
Basic skills: e.g. numeracy, reading literacy, digital literacy, languages.
Transitional skills: e.g. participating in a job interview, preparing a CV (resume).

Governmental support for skills' improvement is widespread in the developed world, and is based, inter alia, on market failures which are especially evident in small and medium enterprises and for low-skilled and low-waged workers:

FIGURE 52:
Market failures for which the marketplace does not handle skill gaps efficiently

EMPLOYERS	WORKERS
RISK LOSING WORKERS After having invested in them	**DIFFICULTY IN FUNDING** Especially for low-waged workers
INSUFFICIENT INFORMATION Regarding the benefits from investment (level of improvement of product, service or productivity)	**INSUFFICIENT INFORMATION** Regarding the options for training and its benefits (wages, promotion)
SHORT-TERM PLANNING Especially in SMEs	**SHORT-TERM PLANNING** Especially for low-waged workers

While the economic crisis resulting from the COVID-19 pandemic affected workers in all wage levels, the impact was especially severe for low-waged and low-skilled workers. There is a growing concern that without relevant training and learning, the low-skilled unemployed will find it difficult to re-enter the labour market. This concern underpins the importance of widening the opportunities for adult learning and for vocational and technological trainings at this time, both for low-skilled workers and for those who were laid off from sectors which will recover slowly.

KEY FIGURES

600,000

Estimated number of workers in Israel employed in jobs that are at a high risk of profound transformation in the next few years (15% of jobs); 2.1 million workers are employed in jobs at a medium-level risk (54% of jobs).

37%

Percentage of adults in Israel (ages 16 to 65) with low levels of literacy or numeracy (compared to an average of 27% in the OECD countries in 2015).

500M NIS

State budget for vocational and technological training in 2018.

53,200

Number of participants in State-sponsored vocational and technological training in 2018.

29%

Percentage of young people who do not participate in State-sponsored trainings or academic studies. Many of them come from a lower socioeconomic background.

7%

Percentage of participants in vocational trainings executed in collaboration with employers, out of the total participants in trainings sponsored by the Vocational Training Department of the Ministry of Labour, Social Affairs and Social Services (MOL).

0.07%

Public expenditure on vocational training as a percentage of the Gross Domestic Product (GDP), compared to a 0.11% average in the OECD countries.

38%

Percentage of workers in jobs at a high risk who wished to participate in lifelong learning activities, but did not do so, due to cost considerations.

AUDIT DETAILS

From March 2019 to May 2020, the State Comptroller examined the programs for vocational and technological training for adults, and Government initiatives for lifelong learning, and their adaptation to the changing labour market and its workforce. The audit was conducted in the Labour Branch of the Ministry of Labour, Welfare and Social Services (MOL)*, the Ministry of Education (MOE), the Ministry of Economy and Industry (MOEI), the Ministry of Finance (MOF) – Budgets Division, the National Digital Israel Initiative, and the Israeli Employment Service. A supplementary audit was conducted in the Ministry of Aliyah and Integration (MOAI).

*In July 2021, the Israeli Government decided the Labour Branch would move under the auspices of the Ministry of Economy and Industry.

KEY FINDINGS

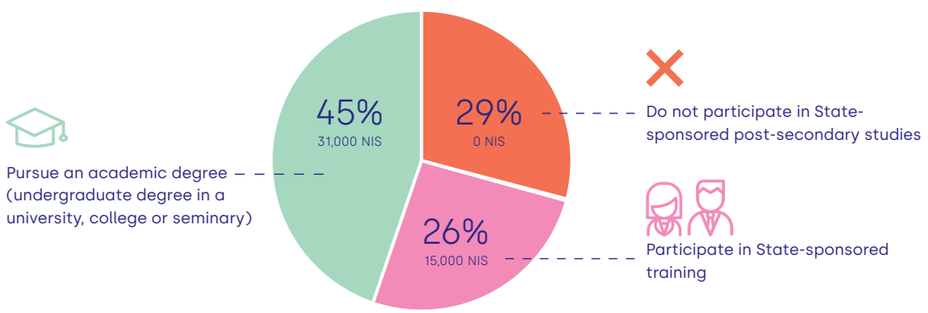
Integration and improvement of the vocational and technological training mechanisms

There are a number of entities in charge of trainings, but they lack coordination in various main aspects. For example, courses for similar professions include different pedagogical content; the Vocational Training Department, the Institute for Technology and Science Training,[21] and the MOE's programs for grades 13 and 14, each collaborate with employers to different extents and in different professional committees; there is no single website containing information regarding all training options available to the public; and there is no unified process of evaluation, guidance, and recruitment. The lack of integration prevents effective utilization of resources and makes it difficult to adapt trainings to the needs of the changing labour market and to those of different populations.

Scope of trainings for young people who do not pursue an academic degree:

About 29% of young people (ages 18-27) did not enjoy any State funding for improving their employability in 2018; most of them come from a lower socioeconomic background, and they constitute about half of those not pursuing an academic degree. This may affect their prospects in the workforce. The audit found that Government has not acted in recent years to enlarge the Vocational Training platform to the extent that it would be in line with the demand and the range of workers in need of training.

FIGURE 53:
YOUNG PEOPLE (AGES 18-27) BY TYPE OF POST-SECONDARY STATE-SPONSORED STUDIES OR TRAININGS, AND AVERAGE FUNDING PER STUDENT PER YEAR, 2018

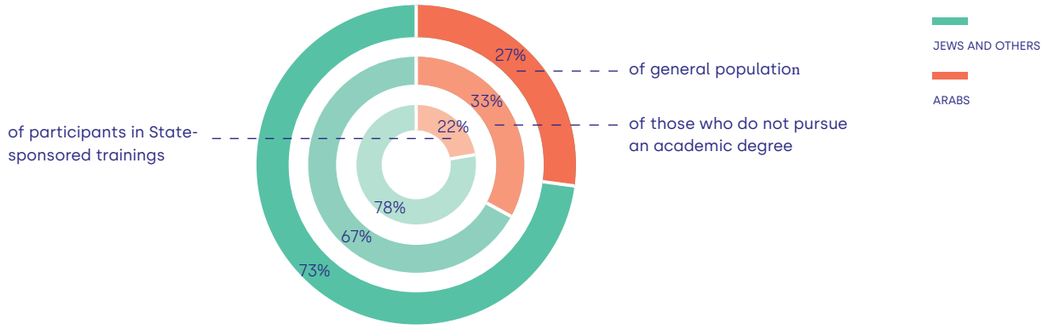


Source: data from the relevant Ministries; the analysis is for an average age-group of young people

Scope of trainings for the Arab population:

27% of young people in Israel are from the Arab population. As this population presents especially high poverty rates (about 47% in 2018), it is of special importance to promote their quality inclusion in the labour market. However, the share of Arabs among young participants in State-sponsored vocational and technological trainings (22%) is lower than their percentage in the population (27%), and also lower than their share among the young people who do not pursue an academic degree (33%). As a result, while there is a large group of Arab youngsters who may require vocational and technological training in order to integrate stably into the labour market, their participation in trainings does not correspond to their numbers and needs.

FIGURE 54:
PERCENTAGE OF ARABS AMONG AN AVERAGE CLASS OF YOUNG PEOPLE (AGES 18-27) IN THE GENERAL POPULATION, AMONG THOSE WHO DO NOT PURSUE AN ACADEMIC DEGREE, AND AMONG PARTICIPANTS IN STATE-SPONSORED VOCATIONAL AND TECHNOLOGICAL TRAININGS, 2018



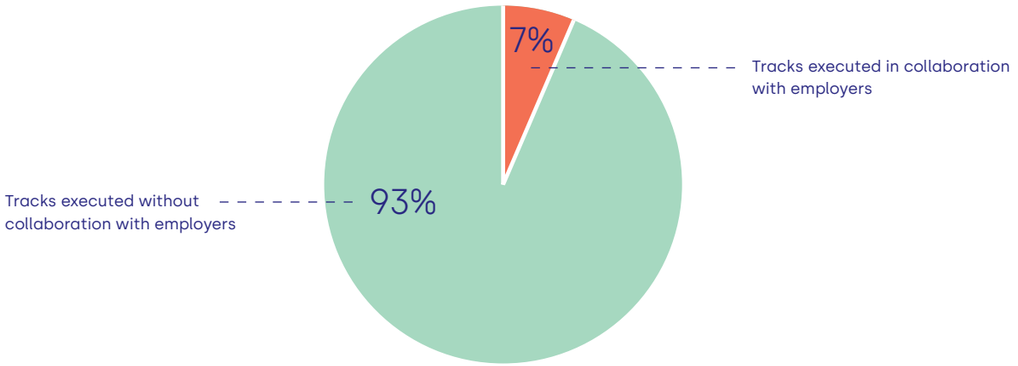
Source: data from various Government ministries

Collaborating with employers on trainings of the Vocational Training Department:

The Vocational Training Department in the Labour Branch of the MOL does not have an adequate process for consulting with employers from various sectors in order to learn about market developments, nor with employers from the geographic periphery or with small and medium-sized enterprises. Consequently, surveys among training graduates indicate that the effectiveness of trainings is less-than-adequate. Only a small portion (7%) of participants in vocational training programs sponsored by the Vocational Training Department do so in one of the tracks executed in

collaboration with employers, despite a wide consensus that such programs are the most effective.

FIGURE 55:
PARTICIPANTS IN VOCATIONAL TRAINING PROGRAMS SPONSORED BY THE VOCATIONAL TRAINING DEPARTMENT, BY TYPE OF TRAINING, 2018

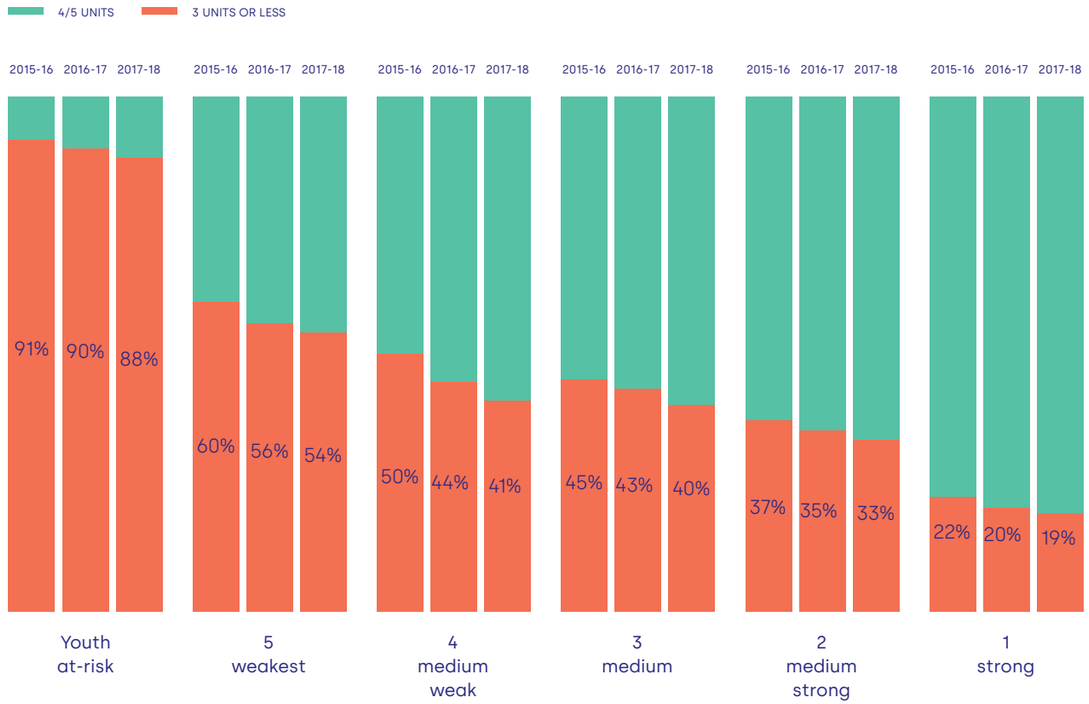


Source: MOL

English as an essential skill for those who do not pursue an academic degree:

Rapid integration of technology in many industry and service sectors, alongside globalization, require workers more and more to have a decent or good control of technical or professional English. This holds true for both academics and workers in non-academic roles. However, in Israel 40% of all 12th-grade students took the English matriculation exam at the lowest level (three-unit level) or did not take the English exam at all in the academic year 2018/2019; many of them are from lower socioeconomic clusters. In the 2015 PIAAC survey, almost half of Israelis (aged 16-65) reported that their speaking, reading and writing level in English is medium or less.[72] Low levels are prevalent among ultra-Orthodox Jewish men, the Arab population, and those whose highest educational level is secondary or less. Thus, it is required to ensure that the 55% of youngsters who do not pursue an academic degree[73] will have good level of English, and to do this at all stages of education and training - in schools and in adult learning and training programs.

FIGURE 56:
12TH-GRADE STUDENTS, DISTRIBUTION BY NUMBER OF UNITS OF ENGLISH MATRICULATION EXAMS, BY THEIR SCHOOL'S PERFORMANCE ON THE NURTURE INDEX (1 – THE STRONGEST POPULATION IN SOCIOECONOMIC TERMS; 5 – THE WEAKEST POPULATION IN SOCIOECONOMIC TERMS)[74], 2015-2018



Source: MOE

The MOE did not sufficiently collaborate with employers and other ministries in order to ensure that the English language curriculum adequately prepares students also for non-academic professions. In addition, the extent of English studies offered in the adult training courses of the Vocational Training Department and the MOE program for grades 13 and 14, is not expected to suffice for the needs of the changing labour market, raising concerns that graduates will not have a sufficient grasp of the English language needed to integrate successfully into the workforce.

Integration of Government activity and a national strategy for lifelong learning:

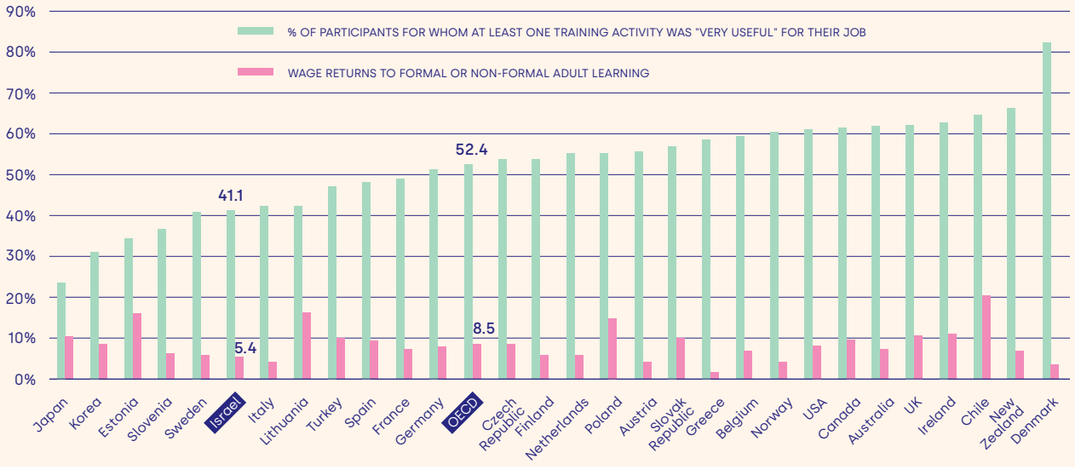
There is no single entity coordinating the activities for lifelong learning. The large array of public entities involved may create difficulties for the clients – the public – to explore their options and adequately select their preference.

Additionally, in contrast to the situation in other developed countries, there is no single leading the assessment of the skills most required in the changing labour market. Each education or training entity develops its own understanding of the required skills and its own methods of imparting them. The various entities also do not collaborate enough with non-governmental stakeholders - employers, unions and NGOs.

Participation in lifelong learning and its quality:

A relatively high percentage (25%) of adults in Israel (in any job) who wished to participate in learning or training activities did not do so due to cost considerations, compared to a 16% average in the OECD countries. Moreover, the return in terms of wages for participation in lifelong learning is low in Israel (5.4%) compared to the average in the OECD countries (8.5%).

FIGURE 57:
EFFECTIVENESS OF LIFELONG LEARNING, OECD COUNTRIES AND OECD AVERAGE, 2015



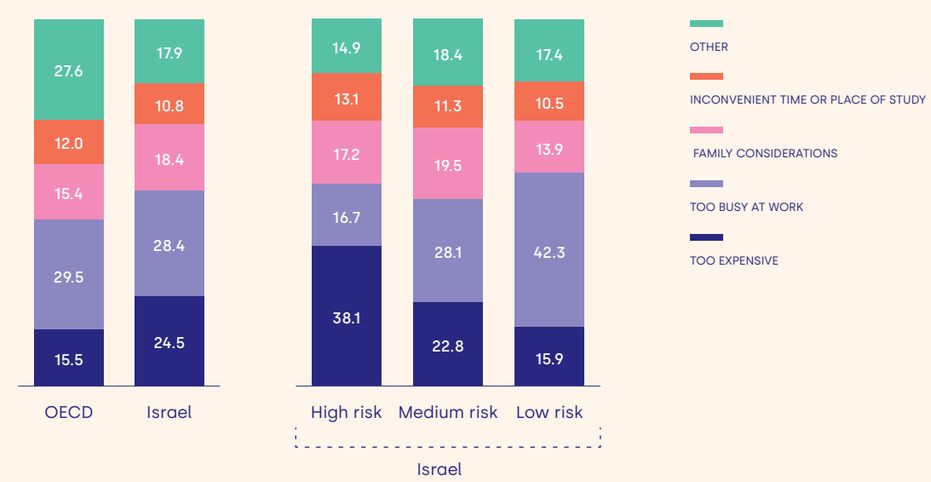
Source: OECD[75]

Encouraging low-waged and low-skilled populations to reskill or upskill:

Some groups are especially in need of professional upskilling, reskilling, or other training. These include low-waged workers, low-skilled workers, older workers, workers in jobs that are at a high risk of automation, the unemployed, and workers in non-standard employment.[76] Without lifelong learning these groups may be let out of the labour market due to the transformations it is undergoing. International studies and surveys show, however, that the workers who are at the highest risk, participate the least in adult learning and training.

Despite the need for proactive and personalized activities, there is no comprehensive program to engage low-skilled populations in adult learning or trainings. There is no framework for in-depth assessment of people's capabilities and needs in order to guide them to the learning and training activities best suited to them. In addition, many low-waged workers in jobs that are at a high risk of transforming profoundly, and many unemployed people, may refrain from participating in a State-sponsored training course, or may drop out of it, due to time and cost considerations. This is underscored by the characteristics of the available funding schemes and timeframes of State-funded courses.

FIGURE 58:
REASONS FOR NON-PARTICIPATION IN LLL AMONG THOSE WHO ARE INTERESTED IN DOING SO, AGES 25-65, 2015



Source: Taub center, based on PIAAC data.

Actions to improve the vocational and technological training mechanisms:

The Committee for Employment Policy for 2030 (appointed by the MOL), conducted an in-depth evaluation of vocational trainings and the changing labour market. Furthermore, at the time the audit was completed, a reform was underway in the Institute for Technology and Science Training in accordance with Government resolutions, in order to improve the quality of technological training.

Online accessibility:

At the audit completion date, the MOL was in the process of developing an online database and occupational guidance system, intended to make information about studies, trainings, and work options more accessible. Furthermore, the National Digital Israel Initiative runs a free online learning platform for adults – CampusIL.

Actions following the employment crisis resulted from the COVID-19 pandemic:

The Israeli Employment Service expanded the selection of the free workshops it offers job-seekers, and adapted them to digital platforms. In addition, the Employment Service began to offer online courses teaching skills and knowledge useful for the labour market. Moreover, The Labour Branch and the National Digital Israel Initiative have also adapted some of their activities to the limitations imposed as a result of the pandemic.

KEY RECOMMENDATIONS

Integration and improvement of the vocational and technological training mechanisms:

It is recommended that the MOL, MOE, MOAI, MOF and the Israeli Employment Service work together to improve the coordination between them, the integration of the training mechanisms, and their quality. In this respect, it is recommended that the Ministries consider the recommendations of the Committee for Employment Policy for 2030 and prepare an action plan accordingly.

Scope of trainings for young people who do not pursue an academic degree and for the Arab population:

It is recommended that the MOL, MOE and MOF (in consultation with other entities that engage in vocational training, such as the MOAI, MOEI, the Ministry of Defense and the Israeli Employment Service) analyze together the scope of State-sponsored trainings being provided. It is recommended that they define which populations require training and the ways to increase their participation in them, in order to optimally address their needs for adapting their professional skills to the changing labour market, taking into consideration the immediate implications of the economic and employment crisis caused by the COVID-19 pandemic. It is also recommended that the MOL and MOE work to increase the share of the Arab population in the trainings of the Vocational Training Department and in the MOE program for grades 13 and 14, both of which train a small percentage of Arab participants, compared to their percentage in the group that does not pursue an academic degree.

Collaborating with employers on trainings of the Vocational Training Department:

It is recommended that the Vocational Training Department establish a systematic dialogue with a wide range of employers in various sectors across Israel, in order to stay updated on their needs. It is also recommended to consider conducting, from time to time, a comprehensive employers' survey, to encourage employers to organize on the sectorial level and cooperate with such organizations, to methodically analyze data on vacancies, and to train employees for the professions that are in demand, while taking into consideration the needs of small and medium-sized enterprises. It is also recommended that the MOL and MOF complete the evaluation of the barriers that prevent more substantial participation of employers and students in those vocational trainings executed in collaboration with employers, work to remove those barriers, and consider increasing the investment in such trainings.

English as an essential skill for those who do not pursue an academic degree:

In light of the future need of all students for a good grasp of the English language to enable them to optimally integrate into the workforce, it is recommended that the MOE define a strategic goal to improve the level of English for students in weaker schools, and work to achieve this goal. It is also recommended that the entities engaged in vocational and technological training for adults and the Employment Guidance Centers evaluate the required extent of English language studies in view of the changing labour market's needs, and update their programs accordingly.

Participation in lifelong learning and its quality

The gaps in skills among the adult population in Israel are tightly related to the substantial gaps in labour productivity, and may hinder the survivability of workers in a changing labour market. It is therefore recommended that the MOL, MOE, MOEI and MOF (in consultation with the Israeli Employment Service and other relevant Ministries) jointly examine the option of increasing the share of participants in lifelong learning activities for adults, both employed and unemployed. They should also evaluate the effectiveness of existing learning activities and strive to improve it. It is further recommended that the MOL and MOE work together to appoint a single leading entity that will assess the skills most required in the Israeli labour market, both currently and anticipating the future, and formulate the methods to provide those skills.

Encouraging low-waged and low-skilled populations to reskill or upskill

It is recommended that the MOL, in collaboration with the MOF, examine courses planning and support mechanisms in order to address the training needs of various populations, including low-waged groups. It is further recommended that the MOL, MOE, MOEI and the National Digital Israel Initiative, in cooperation with the Israeli Employment Service, create a personalized outreach evaluation and guidance program for lifelong learning, that will effectively serve low-waged and low-skilled populations, giving them the tools to succeed in the labour market.

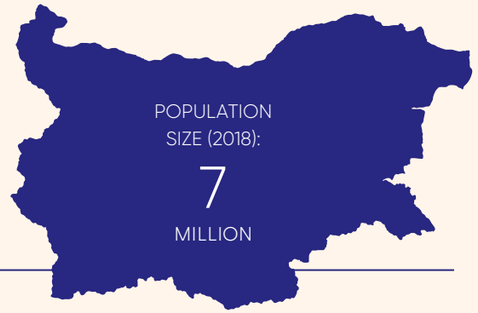
CONCLUSIONS

The frequent transformations in workers' roles around the world, alongside the local demands of the Israeli market for skilled workers in order to improve productivity, and in view of the economic crisis the Israeli market is undergoing at the time of the audit, all require Government ministries to significantly increase the number of trainings they offer, and guarantee their quality. They should also ensure that the workers who are at-risk of being ejected from the labour market in the seeable future, participate in vocational training or adult learning courses (together - LifeLong Learning), in order to stay relevant in the changing labour market.

In light of the reality of the changing labour market and the concern that many workers will have difficulties successfully integrating into it, it is recommended that the relevant Government Ministries, headed by the MOL, MOE, MOEI and MOF, jointly examine the vocational and technological training mechanisms and the options for updating them. They should also evaluate the existing adult learning activities, and improve their accessibility for those populations that need them the most. Moreover, they should improve collaboration with employers regarding vocational training programs, based on the above recommendations. These actions are of particular importance at a time of an economic crisis resulted from the COVID-19 pandemic - when there is a pressing need for professional adaptations and reskilling across the labour market, and especially in those sectors which were most affected. This reality should be taken as an opportunity to upgrade the skills of many unemployed people, enabling them to adapt themselves to the changing labour market and reintegrate into the workforce as soon as possible.

BULGARIA BASIC WORKFORCE INDICATORS[77]

DEMOGRAPHY, ECONOMY, EMPLOYMENT



WORKING AGE POPULATION (2018):

64.5%

OF POPULATION

GDP (2019):

24,505$

US/CAPITA

EMPLOYMENT RATE (2019):

70.1%

OF WORKING AGE POPULATION

LABOUR FORCE PARTICIPATION RATE (2019):

81.1%

OF 25-64 YEAR OLDS

LABOUR PRODUCTIVITY (GDP PER HOUR WORKED - 2019):

25.9$

US

PART-TIME EMPLOYMENT RATE (2019):

1.6%

OF EMPLOYMENT

SELF-EMPLOYMENT RATE (2019):

10.21%

OF EMPLOYMENT

TEMPORARY EMPLOYMENT (2019):

4.4%

OF WAGE/SALARY WORKERS

EMPLOYMENT IN HIGH- AND MEDIUM-HIGH TECHNOLOGY MANUFACTURING SECTORS (2019):

4.2%

OF EMPLOYMENT

EDUCATION, TRAINING, SKILLS

TERTIARY LEVEL EDUCATION (2019):

28.1%

OF 25-64 YEAR-OLDS

ADULT PARTICIPATION RATE IN FORMAL AND NON-FORMAL EDUCATION AND TRAINING (LAST 12 MONTHS - 2016):

24.6%

READING PERFORMANCE (15 YEAR-OLDS - PISA):

72%

AT PROFICIENCY LEVEL 2 OR BELOW (OF 6)

MATHEMATICS PERFORMANCE (15 YEAR-OLDS - PISA):

68%

AT PROFICIENCY LEVEL 2 OR BELOW (OF 6)

SCIENCE PERFORMANCE (15 YEAR-OLDS - PISA):

73%

AT PROFICIENCY LEVEL 2 OR BELOW (OF 6)

COLLABORATIVE PROBLEM SOLVING PERFORMANCE (15 YEAR-OLDS - PISA 2015):

49%

AT LEVEL 1 OR BELOW (OF 4)

SHARE OF INDIVIDUALS WHO HAVE BASIC OR ABOVE BASIC OVERALL DIGITAL SKILLS (ADULTS - EU SURVEY 2019):

29%

BULGARIA BASIC WORKFORCE INDICATORS

POLICY

Government departments in charge of education and employment policy: Ministry of Education and Science (Vocational Education and Training Directorate), Ministry of Labour and Social policy (Labour Market Policy and Labour Mobility Directorate).

Gross domestic spending on R&D (2018): 0.76 % of GDP

MAIN TRENDS OR CHALLENGES

The adverse demographic trends persist in the country and the combination of these negative processes is sufficient to talk about a demographic crisis and poses serious challenges to the future functioning of the systems of social security and assistance, health care, education and public finances. The labour market is already affected by these processes, with a clear prospect of increasing their negative implications even in the medium-term. Along with the negative natural growth, the population of the country is also affected by the ongoing emigration processes as the income levels are lagging behind compared to the other EU member states. The aging workforce in a dynamic labour market with constantly changing requirements for the qualifications and professional skills of employees is a process that simultaneously creates the need to continuously increase the overall potential of the workforce through lifelong learning and imposes active ageing of the population, who continue to work in older age. The education system is still unable to respond adequately to the labour market needs. The level of participation in various forms of lifelong learning remains unsatisfactorily low. Overcoming the lack of good computer and digital skills remains a challenge, because it complicates the extensive use of Information and communication technologies, the services based on them and achieving digital growth.

Significant intra-regional and urban-rural disparities still exist. The population concentration in the seven major cities of the country and the depopulation of territories is a trend that leads to deepening of the regional and territorial disparities in the demographic - and hence in the socio-economic - development of the Bulgarian regions.

STRONG POINTS

The vision and goals of the country's development policies until 2030 adequately recognize the challenges and are focused on the human capital quality and improving the quality characteristics of the workforce, given the deepening demographic crisis and changing labour market requirements. The three strategic goals of the National Development Programme: Bulgaria 2030 are accelerated economic development, demographic upswing and reduction of inequalities. All strategic documents with a horizon of 2030 emphasize on the need for lifelong learning and raising the qualification and retraining of the workforce, with greater emphasis on the soft skills and digital competencies. The success of the country will depend on the effectiveness of the measures taken for their achievement as there is no sufficient evidence that the scale of the forthcoming changes by 2030 is recognised, which may have a negative impact on the processes related to training policies management, incl. vocational education of adults.

SUMMARY AUDIT REPORT 5

NATIONAL AUDIT OFFICE OF BULGARIA

VOCATIONAL TRAINING OF ADULTS

BACKGROUND

Changes in the labour market caused by the development of information technologies and demographic changes put ever higher demands on the qualifications of the employees and the need to combine skills specific for the different professions. In this sense, the need for lifelong learning and continuous trainings, according to the requirements of the labour market, are among the main challenges for the employees.

Lifelong learning and increasing the ability for timely adaptation are the key factors for achieving effective personal realization and sustainable and competitive development of the Bulgarian economy. Training of adults, incl. vocational education for adults is a complex process involving many institutions and organizations. Lifelong learning and improving the suitability of the workforce by increasing the knowledge and skills of employed and unemployed people, incl. in the field of entrepreneurship and information technologies, are set as strategic and operational goals in the Ministry of Education and Science, the Ministry of Labour and Social Policy, the National Agency for Vocational Education and Training and the Employment Agency.

Objectives, measures and activities related to the vocational education for adults and lifelong learning can be found in many national and sectoral strategies and programs, such as: The National Development Program "Bulgaria 2020", the Strategy for the Development of Vocational Education and Training in The Republic of Bulgaria, the National Strategy for Lifelong Learning for the period 2014 - 2020, the Updated Employment Strategy of the Republic of Bulgaria for the period 2013 - 2020, the National Strategy for Active Life of the Elderly in Bulgaria (2019 - 2030), The National Strategy for Demographic Development of the Population in the Republic of Bulgaria (2012-2030), the National Employment Action Plans, etc.

The main sources of funding for adult training, incl. vocational training for adults are the national public funds; financing from the European Structural and Investment Funds; Erasmus + program; investments by employers and personal funds of citizens.

KEY FACTS

2%

Share of the population aged 25-64 participating in any form of education and training in 2019

11%

Share of people with advanced digital skills in 2019, compared to the EU average of 33%

50.5%

Share of people aged 25-64 who do not use a foreign language in 2016

249,133

Number of people who successfully completed vocational training in the period 2017-2019

61,232

Number of people over the age of 16 (excluding students) who acquired a degree of professional qualification in the period 2017-2019

30,550

Number of people trained in various specialties with funds from the state budget during the period 2017-2019

76%

Share of the population who have not heard of validation and do not know what its benefits are

>10%

Share of the population that used career development services

AUDIT ACTIVITIES/DETAILS

The audit aims to provide an independent and objective assessment of how effectively the government is responding to the growing need for new knowledge and skills, retraining and lifelong learning, and to support the management of the Ministry of Education and Science and the Ministry of Labour and Social Policy by formulating recommendations for effective implementation of the activities in view of future challenges to the workforce.

The audit analyzed the readiness to overcome the challenges of providing the necessary workforce by assessing the system for analyzing and forecasting the development of the labour market and the needs for workforce and training. The actions taken to protect and overcome the shortage of specialists in areas important for the country's economy are analyzed. The vision and goals of the country's development policies until 2030 and their focus on the quality of human capital are reviewed. The effectiveness of the system for vocational orientation and training of adults in the context of lifelong learning was assessed. The degree of achievement of the strategic goals

for lifelong learning and the obstacles the adults are facing regarding their participation in formal and non-formal education and training are studied. The availability of necessary preconditions for achieving effectiveness of the system for validation of the professional knowledge, skills and competencies acquired through non-formal learning or self-study were assessed.
The audited period is from 01.01.2017 till 31.12.2019.
To achieve the objectives of the audit, both standard methods for collecting and analyzing information and specific techniques such as "Mystery Shopping" (Mystery Shopper), which was performed by auditors from BNAO remote offices in the country, were used. A survey was also conducted among unemployed people to assess the effectiveness of career orientation services provided by the Employment Agency. An external contractor was assigned to conduct a nationally representative survey among the population and semi-structured interviews with experts from ministries, agencies and nationally representative organizations of employers and employees.

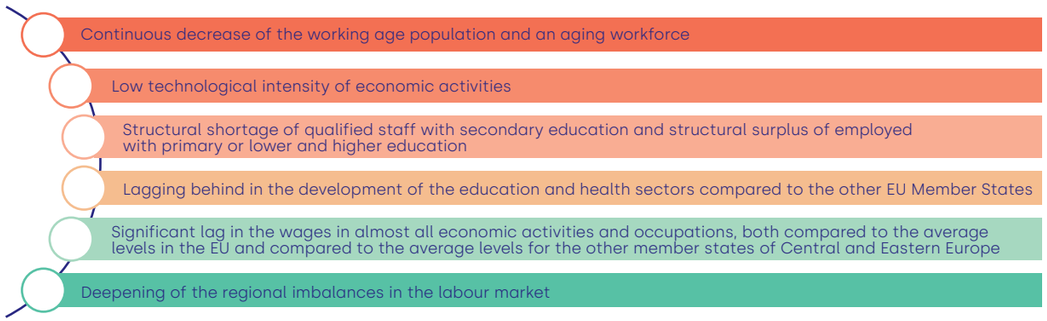
KEY FINDINGS

Willingness to overcome the challenges that the workforce is facing

During the audited period, actions were taken to ensure the state policy in the field of labour market and labour force training with analyzes, studies and forecasts, however there are opportunities for improvement in the analytical, research and forecasting process

The medium-term and long-term forecasts for labour supply and demand prepared in the period 2017-2019 successfully identify key challenges for labour market policy.

FIGURE 59:
Challenges for labour market policy outlined in the forecast until 2034



However, the medium and long-term forecasts do not contain an analysis of the expected changes in the labour market in terms of emerging and disappearing occupations and jobs. The development and presentation of forecasts in summary form by classes and groups of professions, and structural discrepancies by educational degree and economic activities provide a general guideline, but are not detailed enough, which is essential for the purposes of proper planning of educational policy. Expectations for regional imbalances are also not sufficiently detailed and do not provide data on structural disparities by regions. There are also restrictions on employment forecasting in the agriculture, forestry and fisheries sectors; activities of households as employers; undifferentiated activities of households for the production of goods and services for own consumption; activities of extraterritorial organizations and services and the professions of the armed forces. The possibilities for overcoming these issues should be considered.

The study of employers' workforce needs has to be improved

In 2018, the implementation of a mechanism for studying the needs of employers for workforce at the local level begun. The surveys are conducted twice a year, but they are not characterized by a high degree of interest from employers, which complicates the process and has a negative impact on its efficiency. The actions taken to ensure the representativeness of the study and changing the design of the study after its pilot implementation are not sufficient to make it an adequate management tool, and the risk of distortion of the results is not managed effectively enough. In addition, the regulatory requirements for submitting training proposals in line with the needs of employers are not met, which increases the risk of ineffective training policy planning. It should be considered to reduce the frequency of the survey, given the administrative resources that are spent.

A variety of means were applied in order to study the training needs of the workforce, but they still do not support effectively enough the policy management at the national level

During the period 2017-2019, the Employment Agency has applied various methods with the potential to study the training needs of the workforce, incl. to acquire a professional qualification, but due to weaknesses in approaches and their implementation, each of them and all of them together cannot provide sufficient information for the purposes of policy management at the national level. The Agency's and territorial structures capacity for self-study of the training needs are limited to the registered workforce in the employment offices as jobseekers, and this is only a part of the workforce and the results can only serve to validate or adjust larger-scale studies. Identifying the training needs on the basis of analysis of the applications for the announced vacancies in the employment offices poses risk to shift the focus from the actual needs of the market, due to the fact that only part of the vacancies in the country are advertised in the Employment Agency.

The efforts of the Employment Agency are mainly focused on the study of the needs for professional development, key competencies and adaptation of the group of unemployed people, because the employment offices do not collect data regarding the training needs of the employed jobseekers registered in their system. The Agency's "National Labour Market Database and European Social Fund" needs significant upgrades and improvements in order to support the management process effectively and efficiently, as it does not currently have the necessary analytical modules and cannot provide sufficient information for the purposes of adult learning policy.

The system for forecasting the skills that will be needed for the labour market in the future is not fully developed

The country has not yet fully developed the system for forecasting the skills that will be needed for the labour market in the future. Some elements and tools have been developed but they need to be improved. The lack of mechanisms for forecasting the change in professions was also highlighted as a problem in the expert interviews conducted in the framework of the study commissioned by the BNAO for the purposes of this audit. The national labour market is characterized by the problems of the aging workforce, which are to be deepened in the medium and long term, as well as by quantitative discrepancies between labour supply and demand and especially by qualitative imbalances in knowledge, skills and qualifications. As a result, an increasing number of employers point the shortage of skilled labour as a key business problem that needs to be addressed with the participation of all stakeholders.

In 2020, a study of the generational characteristics of the workforce in Bulgaria was conducted, which can be considered as a good practice

In 2020, an analytical report was prepared related to studying the generational characteristics of the workforce in Bulgaria. The report is important and presents the differences in values, characteristics and attitudes, incl. the adaptability of generations to change, attitudes towards learning and intergenerational communication. The shortages of staff are also analyzed, as well as the clashes of the different age groups, and the main conclusions and recommendations are given. The study of generational characteristics can be considered a good practice, as it upgrades the analytical activity with a more complete study, which would contribute to the adequate management of the adult education policy and provides significant information to employers for successful management of one of the most important resources in modern society - human capital.

The National Competency Assessment system is also a useful mechanism that can be upgraded and promoted further

The National Competency Assessment System is an Internet-based information system that by the end of 2019 provides competency profiles

of over 370 key positions in 25 economic sectors, practical e-tools for competence assessment, analysis and evaluation of positions and e-learning for the development of competencies. During the period 2017-2019, the system was upgraded, identifying key positions in 5 new economic sectors.

The platform is free and publicly available with opportunities to register as an individual user or as an organization, but 84% of people in the country have not heard or know anything about the system, which is an indicator of the need for better promotion.

The system is connected to the National Database of the Employment Agency, and the tools for competence assessment can be used by employment agencies in the course of their work with jobseekers. However, the effective use of MyCompetence's capabilities is indirect and depends entirely on the individual desire and level of digital skills of job seekers.

During the period 2017-2019, actions were taken to introduce and build mechanisms aimed at overcoming the shortage of specialists in the labour market, but it is too early to make an objective assessment of their effectiveness. From the point of view of the principles of good governance, however, there are opportunities, incl. regulations to improve the organization and effectiveness of these new and important tools.

In 2018, the Ministry of Education and Science prepared the first list of types of professions with an expected shortage of specialists in the labour market. This was done in the absence of regulations on the nature and criteria for these professions. Furthermore, the process is not carried out in full compliance with the requirements of the legislation, and there are weaknesses in the statutory cumulative criteria, as a result the lists cannot give a complete and sufficiently objective picture of the specialties with expected deficits in the labour market.

The main shortcomings result from the fact that when determining the specialties based on the ratio between the number of students and the specialists in retirement age, the possibilities to include in the list "new" specialties for which there is still no data regarding people in retirement age are limited. In addition, the number of older people who are trained and gained professional qualification in vocational training centers (including through the validation of professional knowledge, skills and competences) is not taken into account and also there are no considerations about how much of the shortage may and will be satisfied through adult training in institutions outside the system of vocational education and training schools. Defining the specialties on the basis of medium-term forecasts and needs with a time frame of up to 3 years does not create conditions for taking proactive action to reduce and prevent shortages in the long run, given the duration of vocational education and the fact that just over 20% of the students graduating from vocational schools and high schools do not acquire a professional qualification, including due to a change in

personal priorities and preferences. The definition of "significance of the specialty of the profession for the economic development of the country and / or district" is linked only to the medium-term need for specialists without defining other criteria and indicators to determine the role and contribution of the specialty for economic development of the country and / or district. The process does not include rules and procedures that clearly regulate the actions and information that need to be collected, processed and analyzed, and there are difficulties in providing information about the activity, which should be overcome with the participation of all stakeholders. Difficulties in developing and updating the lists during the audited period also arise from:
- lack of information and official analyzes about the disappearing professions and the professions of the future in Bulgaria;
- lack of information about the specialties that are important for the economic development of the country, incl. at regional and sectoral level.

The introduction of the mechanisms for prioritization of professional fields and protected specialties under the Higher Education Act began in 2016, and their period of action is too short to be able to make a realistic assessment of their effect in meeting the needs of the country by highly qualified specialists. There are opportunities for improvement in the direction of regulating the procedures for the preparation and update of the Lists of priority professional areas and protected specialties, incl. in terms of the criteria and indicators to be used. It is necessary to rethink the vision for the prioritization process, because up to 31.12.2019 70% of the areas of the Classifier of Higher Education and Professional Areas have been identified as priorities. Throughout the audited period, all professional directions in the fields of social, economic and legal sciences, healthcare and sports, security and defense, incl. "Medicine", "Health Care", "Public Health", "National Security" and "Social Activities" are defined as non priority, although for some of them there is sufficient data regarding the current and future staff shortages. At the same time, for some of them additional opportunities are provided and used to increase the enrolment of students and PhD candidates.

DATA REGARDING THE NEED FOR HIGHLY QUALIFIED PERSONNEL IN THE HEALTHCARE SYSTEM

According to the data of the Health Profile for Bulgaria for 2019, a product of the joint work of the Organization for Economic Cooperation and Development (OECD) and the European Observatory on Health Systems and Policies in cooperation with the European Commission, the number of nurses in Bulgaria is the second lowest in the EU after Greece.[78] The lack of nurses in the country was reported as a problem by the Minister of Health in 2019. The lack of highly qualified staff in the health care system is indicated as a problem in the Analysis of socio-economic development, which was used as a basis for preparing NDP Bulgaria 2030[79] and overcoming the shortage of medical specialists is part of the Council's recommendations on the National Reform Program of Bulgaria for 2018 and the Convergence Program of Bulgaria for 2018[80]. In the preliminary partial impact assessment of the draft decree amending the Council of Ministers Decree № 64 of 2017 it is stated that the need for training more specialists in the professional fields "Public Health" and "Health Care" is identified.

In the period 2017-2019, the envisaged mechanisms for reducing tuition fees in the priority professional areas and protected specialties were not applied, thus the opportunities for encouraging students and PhD candidates were not used.

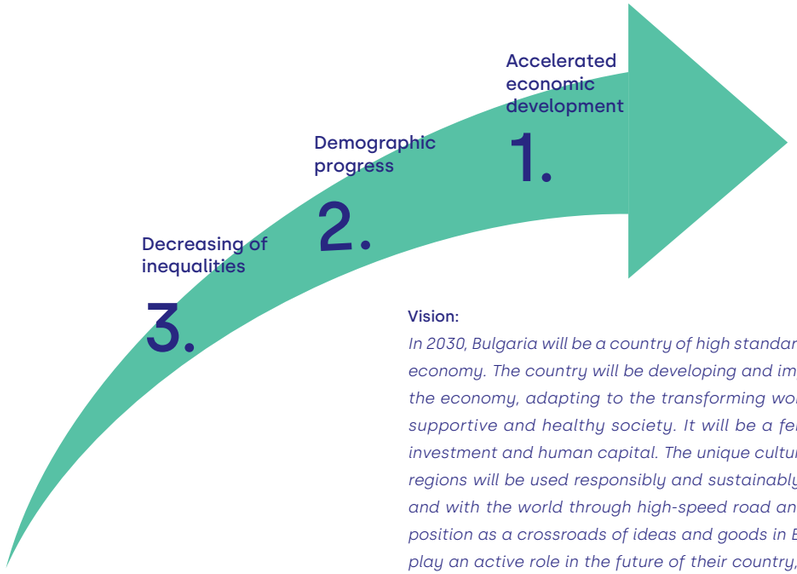
At the end of February 2020, significant amendments were made to the Higher Education Act, incl. the definition of a priority professional field was also changed. The adoption of a National Map of Higher Education in the Republic of Bulgaria is also envisaged, which should define the profile and territorial structure of higher education in the country by professional fields and specialties of the regulated professions in accordance with socio-economic development and labour market needs. The deadline for its preparation is one year from the entry into force of the law. In mid-2020, a 2-year National Tripartite Agreement was signed between the government and the social partners, the nationally representative organizations of employers and employees. The agreement provides for the adoption of measures aimed at changing the structure and management of public higher education and creation of a mechanism, guaranteeing compliance between the admission plan in the vocational high schools and universities and the public needs, as well as change in the financing of the higher education for promotion of the realization in the country. There is no legislation to ensure a link between training, the employer and the state and to prevent the outflow of trained staff abroad.

The vision and goals of the Bulgaria's development policies until 2030 are also focused on the quality of human capital, but there is no assurance that the scale of the need for retraining and further training of the workforce, which is forthcoming by 2030, is clear enough.

The vision and goals of the Bulgaria's development policies until 2030 adequately recognize the challenges and are focused on the quality of human capital and improving the quality characteristics of the workforce, given the deepening demographic crisis and changing labour market requirements.

The strategy documents emphasize on the need for lifelong learning, with a tangible accent on the soft skills and digital competences, but there is no assurance that the responsible institutions have clarity about the actual extent of the necessary changes and the scale of the need for retraining and further training of the workforce, which are forthcoming by 2030. This may have a negative impact on the management processes of training policies, incl. vocational education for adults. The process is hampered by the lack of targeted analysis of disappearing and emerging occupations and the lack of a comprehensive system for forecasting future skills needed for the labour market.

FIGURE 60:
Strategic goals of the National Development Program Bulgaria 2030



Vision:
In 2030, Bulgaria will be a country of high standards of living and a competitive, low-carbon economy. The country will be developing and implementing innovations in every sector of the economy, adapting to the transforming world through its highly educated, creative, supportive and healthy society. It will be a fertile ground for ideas and a magnet for investment and human capital. The unique cultural and natural resources of the Bulgarian regions will be used responsibly and sustainably. They will be integrated with each other and with the world through high-speed road and optical links, establishing the country's position as a crossroads of ideas and goods in Europe and beyond. Bulgarian citizens will play an active role in the future of their country, have rich opportunities for personal and professional development and live in a just and tolerant society, in which their voice is heard.

The focus of efforts to improve the skills of the unemployed, young people, the economically inactive and vulnerable groups is understandable given the limitations in the available public financial resources. A clear strategy should also be elaborated for improvement of the quality characteristics of the employed individuals, who will also need timely updating of their knowledge, skills and competencies in order to remain competitive and help increase the productivity of the Bulgarian economy. The COVID-19 pandemic has once again demonstrated the importance of preparedness processes and the ability to adapt quickly to changes that can occur in a very short time and have a significant impact on entire branches and sectors of the economy.

The National Tripartite Agreement signed in 2020 includes measures related to the provision of lifelong learning and continuing vocational training, through the establishment of tripartite sectoral funds for qualification and retraining, the introduction of individual training accounts and the establishment and maintenance of a forecasting system for the public needs of certain professions, skills and competencies, incl. in key economic sectors. The agreement is expected to be implemented through three successive action plans, but no such documents have been adopted by September 2020.

Effectiveness of career orientation and training of adults in the context of lifelong learning

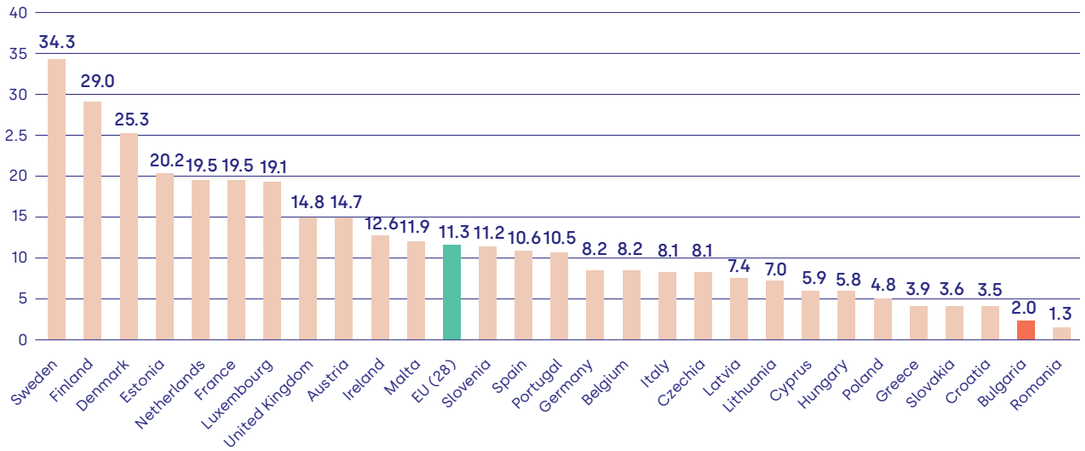
Encouraging lifelong learning is among the priorities and strategic goals of the public authorities in Bulgaria since 2008, but the progress over the last 12 years is insignificant and the national goal for 2020 for adults participating in education and training activities is not achieved.

Encouraging lifelong learning is recognized as a necessity and is among the priorities and strategic goals of the public authorities in Bulgaria since 2008, when the first National Strategy for Lifelong Learning for the period 2008-2013 was adopted. A new National Strategy for Lifelong Learning was adopted in 2014, which defines the strategic framework of the state policy for education and training for the period 2014-2020 and is aimed at achieving the European goal for intelligent, sustainable and inclusive growth.

Although the planned trainings of adults - unemployed and employed, financed from the state budget and ESIF increased for the period from 2017 to 2019, the national goal for 2020 for adults participating in education and training activities will not be achieved. Bulgaria's poor position regarding the values of most of the internationally comparable indicators in the field of lifelong learning sets it in a situation of a country that has to catch up with the average European achievements for the period after 2020. It is necessary to make lasting efforts for the overall improvement of the quality and efficiency of the national education and training system. In 2019, Bulgaria remains in the penultimate place among the EU countries in

terms of the share of the population aged 25-64 participating in education and training activities. Our results are almost six times lower than the EU average, and compared to leading countries such as Sweden and Finland - between 17 and 15 times lower.

FIGURE 61:
Participation rate in education and training (last 4 weeks), 2019

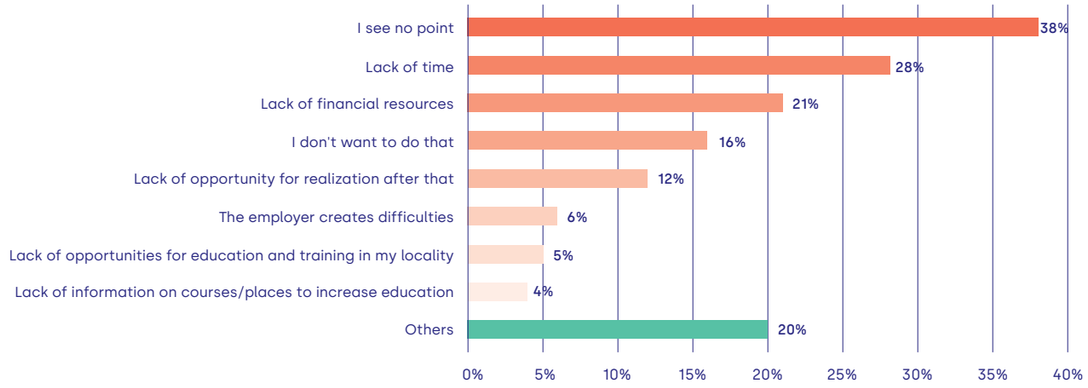


Source: EUROSTAT[81]

The poor participation of adults in lifelong learning activities does not allow the full utilization of their potential to meet the current needs of the business of skilled workforce.

The results of the nationally representative survey conducted for the purposes of the audit show that among the population in the country (especially people over 50 years old) there is a lack of positive attitude towards lifelong learning. In accordance with this attitude, the share of people attending further training / competence courses remains low (less than 10%), and the knowledge about the sources of information for training for acquiring professional qualification is also not high (68% of the people do not know where they can get information about the ongoing trainings for acquiring professional qualification). The main barriers regarding the participation in some form of education are: the lack of meaning for the elderly people, time for the active population and finances for the young people. An additional barrier for the youngest (15-24 years) is the lack of vision for their realization, and for the active population - the lack of understanding from the employers' part.

FIGURE 62:
Barriers regarding the participation in some form of training or education activities for professional development



Source: Sociological survey, 2020

In Bulgaria, the training of employees conducted by employers is still not well developed and is a practice mainly in large enterprises, in contrast to small and medium enterprises. In this regard, it is necessary to provide additional incentives for employers in micro, small and medium-sized enterprises to involve their employees in training in order to improve their qualifications and skills.

In order to achieve the strategic goals of the National Strategy for Lifelong Learning 2014-2020, it is necessary to make significant changes in the policy for lifelong learning, both in terms of improving public awareness of the benefits of vocational qualification and necessary activities for retraining, as well as by increasing the incentives for participation in education and training activities, improving the material base, preparedness of the personnel for the implementation of the trainings, change in the legal framework, etc.

The mechanism for monitoring the implementation of the National Strategy for Lifelong Learning for the period 2014-2020 is characterized by significant weaknesses that prevent the timely identification of problems and the need to change the measures of the strategy.

The system for vocational orientation for adults in Bulgaria still does not effectively support individuals for their realization on the labour market, as the provision of vocational orientation services is still a challenge for all participants in the process.

In the context of lifelong learning, career orientation is associated with a range of activities that help people of all ages and at all stages of their lives to determine their capacity, competences and interests, to make decisions about their education, training and employment, and to manage their individual life and opportunities for study, work and other commitments. Within these activities their capacity and competencies can be acquired and / or applied.

Adult vocational orientation services in the country are provided by many institutions and organizations, incl. Employment offices and career centres at the Employment Agency, Employment and Social Assistance Centres, State Enterprise "Bulgarian-German Centre for Vocational Training" under the Minister of Labour and Social Policy and Centres for Information and Vocational Orientation, licensed by the National Agency for Vocational Education and Training.

For the purposes of the analysis and evaluation of the vocational orientation services for adults provided by the Employment Agency, the Mystery Shopping (Mystery Shopper) technique was used, where BNAO auditors visited the Employment Offices in 18 regional cities or 64% of the regional cities in the country. The "Mystery Shopper" technique is also applied in 8 out of 10 of the Career Centres at the Regional Employment Offices Directorates in the country. A survey was also conducted among unemployed persons registered in the employment offices of the Employment Agency, selected randomly.

Excerpt from the results of the specific techniques applied for collecting audit evidence for evaluation of the career orientation services of the Employment Agency.

KEY POINTS FROM THE APPLIED "MYSTERY SHOPPER" TECHNIQUE IN THE EMPLOYMENT OFFICES

- 17% of the individuals have been denied the provision of vocational orientation service, regardless of the fact that the service should be provided to everyone registered as job seeker

- Only from 60% of the people information is collected, during the vocational orientation services about their work and professional experience, type and degree of education, completed trainings and/or professional qualifications and acquired key competences, regardless the fact that without this information it is not possible to provide adequate vocational orientation and counseling

- Only 33% are guided to the internet platform National Competence Assessment System https://mycompetence.bg/, where they can do tests individually

- 34% of the individuals were not provided with information about training institutions

- Only 26% of the persons were given information about the services provided by the Career Centers to the regional employment services, as an alternative form for providing vocational orientation services

- Given the different practice of employment agents in the Employment Offices regarding the provision of career orientation services to employees, users of services involved in the technique "Mystery Shopper" cannot unambiguously assess the degree of the employment agents preparedness for the service. The share of those who answered positively to the question whether the employment agent is aware of the type, content, activities and manner of their implementation included in the career orientation service is equal to those who gave a negative answer, which supports the conclusion of the need for additional efforts by the Employment Agency to unify the work practices in the territorial divisions.

KEY POINTS FROM THE CONDUCTED SURVEY AMONG THE UNEMPLOYED, REGISTERED IN THE EMPLOYMENT OFFICES

- Information about the professional knowledge, skills and competencies, acquired through non-formal learning or self-study, was requested only for 32% of the respondents

- Specialized information materials (tests and / or questionnaires) and / or software products for assessment of competencies were used only for 21% of the respondents, and 7% were directed to do tests independently

- The training needs were discussed and recorded only for 32% of the users of the service, and for 64% these opportunities were not discussed at all

- Based on the information collected by the employment agent, information is provided on alternative professional fields, incl. for the choice of a new profession and the ways for acquiring the desired qualification of only 36% of the respondents

- As a result of the vocational orientation service, 12 persons or 43% understood what actions for personal and professional development they need to take in order to easily adapt to the changes in the labour market, and only 9 persons or 32% understood what qualification, skills and competencies they will need in order to still have a job in 10 years.

KEY POINTS FROM THE CONDUCTED "MYSTERY SHOPPER" TECHNIQUE IN THE CAREER CENTERS AT REGIONAL EMPLOYMENT OFFICES DIRECTORATE

Complete information is collected only for 50% of the individuals regarding their work and professional experience, type and degree of education, completed training and / or professional qualifications, acquired key competencies, interests and desires to change their profession and / or workplace, regardless the fact that without this information it is not possible to provide adequate vocational orientation and counseling

- 6 persons or 75% were informed about the opportunities for vocational training, continuing education, incl. new educational qualification degree and acquisition and / or raising of a qualification level. Only 5 of them were also informed about the possibilities for the financing of these trainings. Information about the training institutions - Vocational training centers, secondary and higher schools, colleges, postgraduate qualification centers, etc. (curricula, material and technical base, etc.) is presented to 5 persons or 63%

- Information about the important professions at regional and national level, as well as which are and will be most sought after is provided to only 25% of the persons, and information regarding the professions of the future in Bulgaria is presented only to one person

- Half of the people are satisfied with the service provided and believe that they have received enough information from career counselors. The others are not satisfied with the provided service or are partially satisfied, and consider that the provided information is not enough to make an independently informed decision for professional re-orientation.

The results of the on-the-spot checks, applying the Mystery Shopper technique and the survey among unemployed persons registered into the employment offices showed that career orientation is carried out according to different methodologies and rules, without introducing a uniform standard for these services. There is a different understanding of the nature and scope of services between individual employees within an institution, as well as between different institutions providing the service. Applying different practices shows that the provision of the service depends on the professional competence of the respective employee and therefore it is necessary to conduct continuous training on uniform standards and methodology and take action to better ensure the process.

Although the activities are intended for everyone - unemployed, employed and students, for the period 2017-2019, the vocational orientation service is provided mainly to unemployed people.

In the period 2017-2019, sufficient publicity regarding the information for the career orientation services was not provided, incl. about their content and benefits, as a result they are not known to citizens and their use is relatively limited. Less than 10% is the share of people who have used career development services.

The Employment Agency has set up an Information System "National Database for the Labour Market and the European Social Fund", but it does not contain complete information on the vocational orientation services provided by all departments and employees of the Agency, as well as for all groups of people looking for job. The information system for the Career Centres elaborated during the implementation of the project “Career Development for Employees” is not used and the information obtained from it is not included (migrated) in the National Database. Therefore, the sustainability of the results and good practices achieved in previous projects implemented by 2017 and related to the vocational orientation, is not ensured. The lack of complete and accurate information about the provided vocational orientation services in the system of the Employment Agency and the availability of systems in other organizations / institutions providing vocational orientation services complicate the analysis of career orientation data at national level.

The subsequent professional realization of the people using vocational orientation services is not monitored and analyzed, which leads to the impossibility for adequate assessment of the effectiveness of the vocational orientation and improvement of the activity by the responsible institutions.

Adult trainings are not used effectively enough as a way to improve the quality of the workforce and to overcome the imbalance between supply and demand in the labour market.

Achieving better compliance and reducing staff shortages also depends to a large extent on the effectiveness of the training funding mechanism. During the audited period 2017-2019, two criterion systems for evaluation of programs and projects for financing from the state budget of the active labour market policy and inclusion in the National Action Plan for Employment were applied, and from the end of 2017 it is envisaged preferential financing of projects and programs with planned trainings in professions and specialties in demand on the labour market.

During the elaboration of the National Action Plan for Employment 2020 for the first time it is proposed to apply a differentiated approach in determining the amount of funds allocated for adult training per person in the most sought-after professions, based on surveys conducted in 2019 among employers. The actions taken for preferential financing of various forms of vocational training of adults in occupations in demand on the labour market are a step in the right direction, but it is necessary to achieve a higher degree of compliance between the professions to which the funding mechanism from the state budget is applied and the identified needs of employers and specialties for which labour market shortages are expected. The introduction of additional criteria for compliance with regional specifics and national priorities and the extension of the scope of the mechanism regarding trainings financed by the European Structural and Investment Funds would provide a larger and more adequate response to the needs arising from the imbalance between supply and demand on the labour market.

As of December 31, 2019, the country has not yet established a national system for monitoring the transition of graduates of vocational education and training to the labour market and to their further education and training. Actions have been taken to create a prototype for monitoring the development of graduates of vocational education and training by combining administrative data (from the educational system and the labour market) with sociological surveys, as the Ministry of Education and Science envisages the development and implementation of the overall mechanism to be implemented through the funds of the European Social Fund under the Education Program 2021-2027.

Despite the strategically declared need, the country has not yet integrated the databases of the Ministry of Labour and Social Policy, the Employment Agency, the Social Assistance Agency, the National Revenue Agency, the National Social Security Institute, the Ministry of Education and Science. In the conditions of undeveloped national monitoring systems and non-integrated databases, the main mechanism for exchange of information for subsequent implementation of the trained individuals between the separate institutions is by performing individual checks in separate registers, which does not guarantee reliability of the received data and creates significant additional burden on the administration.

At the regional level there is no assessment and reporting of the effect of the implementation of measures and programs for active labour market policy (including training of adults), and there is no data on analyzes of the implemented programs and measures taken in order to identify those that are most appropriate for implementation in the respective region and that would have the best effect on the regional labour market. The need to take into account the specifics of the different regions has also been identified by the Employment Agency. The lack of purposeful monitoring on an annual basis of the realization of the trained people, incl. and the link between employment and qualifications and the analysis of the usefulness of training in terms of their contribution to increase job opportunities for jobseekers and improvement of job matching, deprives active labour market policy planning of an important tool for increasing the effectiveness of the funded training of people seeking jobs.

The Ministry of Labour and Social Policy has carried out an ex-post evaluation of the implementation and impact of active labour market policy, mistakes are made, but, if those mistakes are overcome, it will increase the impact of evaluations, expand their scope and allow the use of results for operational planning purposes.

The level of the indicators for the working poor individuals: digital skills, use of foreign languages, acquisition of a degree of professional qualification and their development trend, incl. other EU countries, show that the measures applied need to be reconsidered in order to improve the quality of the workforce in response to changing labour market requirements. The low levels of digital skills in the period of the fourth industrial revolution reduced the opportunities for individuals to perform more skilled work. The negative effects of these deficits are even more visible in the current pandemic environment, which has shown the importance of digital assets, including digital skills for the economy and its potential to continue functioning.

TABLE 2:
Individuals' level of digital skills, 2019[82]

	Bulgaria	Average for the EU
Relative share of people with low digital skills for 2019	38%	28%
Relative share of people with basic digital skills for 2019	18%	25%
Relative share of people with advanced digital skills for 2019	11%	33%

Source: EUROSTAT

Serious efforts are needed to overcome this state of "lagging behind country" and to achieve the national goal set by 2030 to reach the EU average level of the index for the use of digital technologies in the economy and society.

The use of foreign languages in Bulgaria is lower in comparison to the EU average, and the globalization of the modern world imposes this key competence as a necessary condition for better employment.

TABLE 3:
Number of foreign languages known (self-reported)[83]

Using foreign languages	People who don't use a foreign language (%)			People who use one foreign language (%)			People who use two foreign languages (%)			People who use three foreign languages (%)		
Years	2007	2011	2016	2007	2011	2016	2007	2011	2016	2007	2011	2016
EU 28	37,0	34,3	35,4	38,4	35,4	35,2	17,7	21,3	21,0	7,0	9,1	8,4
Bulgaria	44,1	61,1	50,5	30,0	24,4	32,5	21,2	11,7	13,7	4,7	2,8	3,3

The country has not yet established an overall system for ensuring the quality of vocational education and training, and the lack of comprehensive analyzes by the responsible institutions also complicates the management process.

Created prerequisites for the effectiveness of a system for validation of professional knowledge, skills and competencies

During the period 2017-2019, the necessary prerequisites for achieving the effectiveness of the system for validation of professional knowledge, skills and competencies have not been fully provided.

The conditions and procedure for validation were determined in 2014 by an ordinance of the Minister of Education and Science, which has not been updated since its issuance and does not reflect the significant changes in the Vocational Education and Training Act and the changes made with the entry into force of the new Law on Preschool and School Education. There are also gaps in the regulation of key functions and responsibilities for effective process management, in conditions of decentralization.

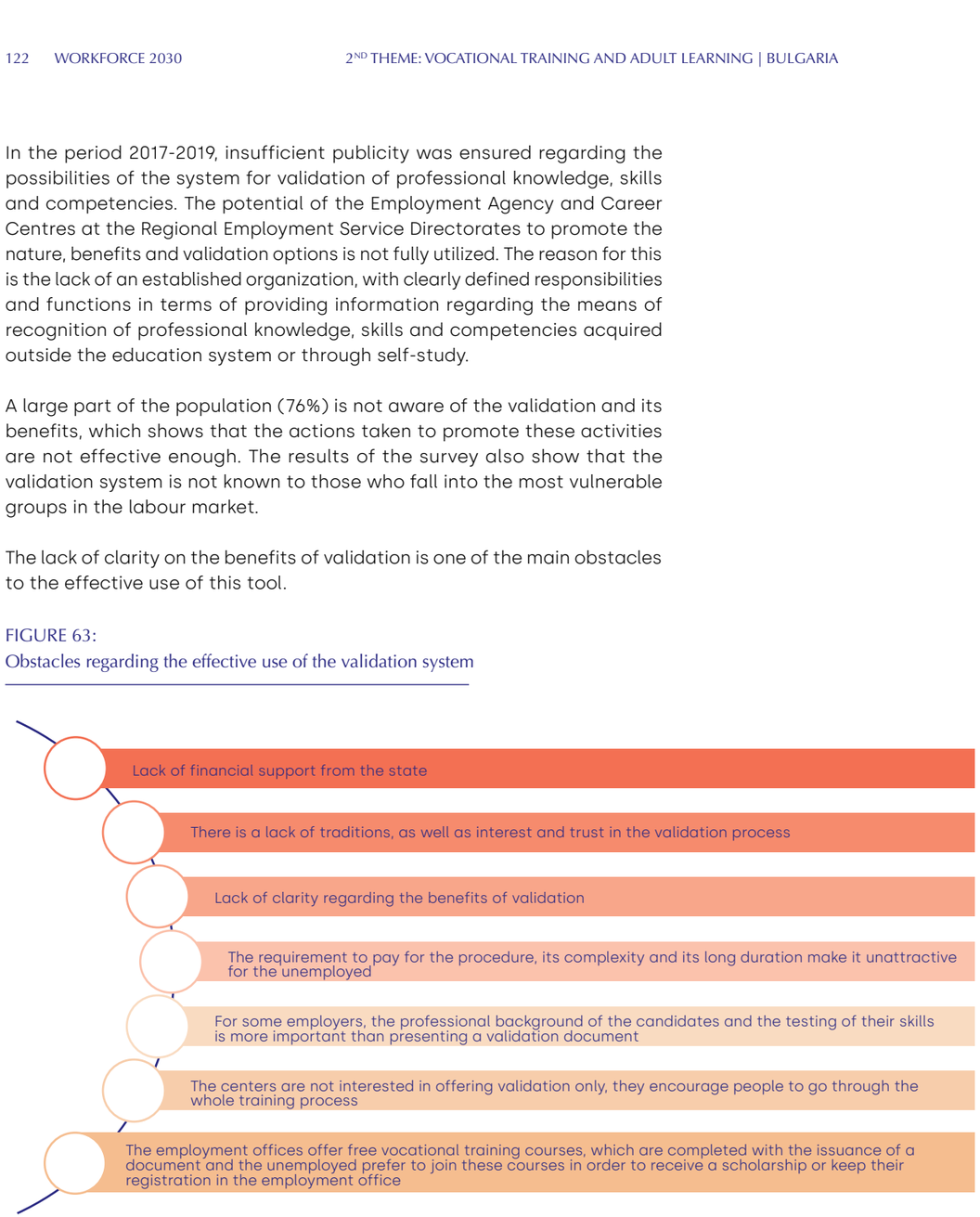
Not in all inspected vocational training centers was established the internal regulations regarding the validation of professional knowledge, skills and competencies, and there is a diverse practice in the schools included in the sample.

In the period 2017-2019, insufficient publicity was ensured regarding the possibilities of the system for validation of professional knowledge, skills and competencies. The potential of the Employment Agency and Career Centres at the Regional Employment Service Directorates to promote the nature, benefits and validation options is not fully utilized. The reason for this is the lack of an established organization, with clearly defined responsibilities and functions in terms of providing information regarding the means of recognition of professional knowledge, skills and competencies acquired outside the education system or through self-study.

A large part of the population (76%) is not aware of the validation and its benefits, which shows that the actions taken to promote these activities are not effective enough. The results of the survey also show that the validation system is not known to those who fall into the most vulnerable groups in the labour market.

The lack of clarity on the benefits of validation is one of the main obstacles to the effective use of this tool.

FIGURE 63:
Obstacles regarding the effective use of the validation system



Source: Survey among regional education departments and experts from key ministries, agencies and nationally representative organizations of employers and workers, 2020

During the period 2017-2019, actions were taken to mobilize funds from the European Union programs in order to improve the system for validation and financing of the validation of professional qualifications, but by the end of 2020 the procedures have not been started. The lack of effective financial support measures limits access to these tools for people from vulnerable groups in the labour market.

During the period 2017-2019, validation of professional knowledge, skills and competencies was performed both in licensed vocational training centers and in institutions from the school education system, but their number is not significant.

TABLE 4:
Validation of professional knowledge, skills and competencies

	2017	2018	2019	In total for the period:
Number of validations in vocational training centres	169	154	395	**718**
Number of validations in institutions from the school education system	69	123	88	**280**

Source: National Agency for Vocational education and Training and Ministry of Education

The country has not yet established a mechanism for collecting and analyzing data on the validation of professional knowledge, skills and competencies of all institutions involved in the process, which makes it difficult to effectively monitor the process in full. Creating a structural unit in the Ministry of Education and Science for ongoing analysis and evaluation of the effectiveness of the validation system, in the current decentralization, would contribute to more effective management of the process as a whole and taking timely action to overcome the problems that occur.

The monitoring activities of the National Agency for Vocational Education and Training and the regional departments of education are poorly developed in terms of verifying the organization and conducting the validation procedures. The number of inspections performed for the period 2017-2019 is insignificant regarding the number of institutions and organizations that carried out validation. The lack of detailed rules and procedures for exercising control over the organization and conduct of validation by institutions in the system of school education and vocational colleges does not create conditions for its adequate implementation, and the lack of updating of the rules of National Agency for Vocational Education and Training, including the non-fulfillment of the normative requirements regarding the provision of the

administrative capacity necessary for the agency creates a risk for the effective implementation of the activity of National Agency for Vocational Education and Training.

Holders of certificates and documents for validation of professional qualification have the same rights as people who have received a certificate of professional qualification and certificates for professional training in the formal education system. The necessary preconditions have been created to facilitate the recognition of certificates for validation of professional qualifications and certificates on the European labour market by mentioning the respective level of the European Qualifications Framework, which corresponds to the level of the national qualifications framework.

KEY RECOMMENDATIONS

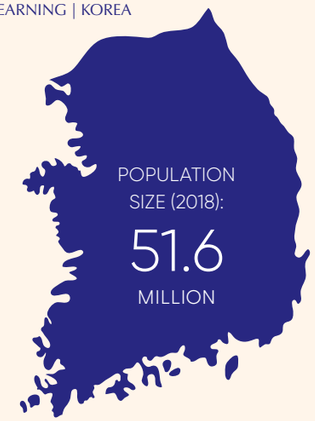
As a result of the conducted audit, the Minister of Labour and Social Policy and the Minister of Education and Science were given a total of 49 recommendations aimed at:
- improving the analytical and forecasting process for the development of the labour market and the needs of the workforce, incl. for training of adults;
- upgrading and maintenance of a system for forecasting the public needs of certain professions, skills and competencies, incl. in promising and key sectors in the economy;
- synchronizing the strategic goals for adults participating in education and training activities and providing the necessary conditions for effective monitoring of the implementation;
- increasing the efficiency of career orientation services and guaranteeing the right of jobseekers to use a public career orientation service of the same quality;
- increasing the effectiveness of adult training policy;
- providing the necessary preconditions for making the validation into an effective tool for facilitating access to the labour market.

CONCLUSIONS

The actions of the Ministry of Labour and Social Policy and the Ministry of Education and Science aimed at adequately addressing the growing need for the acquisition of new knowledge and skills, retraining and lifelong learning in order for the individuals to better realize themselves into the labour market are not effective enough. Further efforts are needed to successfully address the challenges that the workforce is facing, posed by information technology developments and demographic change, which are set to deepen in the medium and long term. However, effectively addressing the challenges depends not only on public authorities, but also on the attitudes, awareness and understandings of employers and citizens about the importance of the lifelong learning process.

Matej Kastelic / Shutterstock.com

KOREA BASIC WORKFORCE INDICATORS[84]



DEMOGRAPHY, ECONOMY, EMPLOYMENT

WORKING AGE POPULATION (2018):

72.8%

OF POPULATION

GDP (2019):

42,925$

US/CAPITA

EMPLOYMENT RATE (2019):

66.8%

OF WORKING AGE POPULATION

LABOUR FORCE PARTICIPATION RATE (2019):

76.6%

OF 25-64 YEAR OLDS

LABOUR PRODUCTIVITY (GDP PER HOUR WORKED - 2018):

39.6$

US

SHARE OF JOBS AT HIGH RISK OF AUTOMATION OR SIGNIFICANT CHANGE (2019):

43.2%

PART-TIME EMPLOYMENT RATE (2019):

14%

OF EMPLOYMENT

SELF-EMPLOYMENT RATE (2019):

24.6%

OF EMPLOYMENT

TEMPORARY EMPLOYMENT (2019):

24.4%

OF WAGE/SALARY WORKERS

EMPLOYMENT IN HIGH- AND MEDIUM-HIGH TECHNOLOGY MANUFACTURING SECTORS (2018):

22.3%

OF EMPLOYMENT

EDUCATION, TRAINING, SKILLS

TERTIARY LEVEL EDUCATION (2019):

50%

OF 25-64 YEAR-OLDS

SHARE OF ADULTS WHO PARTICIPATED IN JOB-RELATED LEARNING (2015):

38%

LITERACY (ADULTS - PIAAC):

50%

AT PROFICIENCY LEVEL 2 OR BELOW (OF 5)

NUMERACY (ADULTS - PIAAC):

58%

AT PROFICIENCY LEVEL 2 OR BELOW (OF 5)

PROBLEM SOLVING IN TECHNOLOGY RICH ENVIRONMENT (ADULTS - PIAAC):

56%

AT PROFICIENCY LEVEL 1 OR BELOW (OF 3)

READING PERFORMANCE (15 YEAR-OLDS - PISA):

36%

AT PROFICIENCY LEVEL 2 OR BELOW (OF 6)

MATHEMATICS PERFORMANCE (15 YEAR-OLDS - PISA):

32%

AT PROFICIENCY LEVEL 2 OR BELOW (OF 6)

SCIENCE PERFORMANCE (15 YEAR-OLDS - PISA):

35%

AT PROFICIENCY LEVEL 2 OR BELOW (OF 6)

COLLABORATIVE PROBLEM SOLVING PERFORMANCE (15 YEAR-OLDS - PISA 2015):

12%

AT LEVEL 1 OR BELOW (OF 4)

KOREA
BASIC WORKFORCE INDICATORS

POLICY

Government departments in charge of education and employment policy: Ministry of Education, Ministry of Employment and Labour.

Public expenditure on active labour market measures (2017): 0.32% of GDP

Gross domestic spending on R&D (2018): 4.53% of GDP

MAIN TRENDS OR CHALLENGES

Reduction of working age population (37.4 million in 2020, 33.9 million in 2030, 24.5 million in 2050) due to low fertility and aging population.

STRONG POINTS

High level of ICT infrastructure, high competitiveness of the manufacturing industry, excellent human resources.

SUMMARY AUDIT REPORT 6

THE BOARD OF AUDIT AND INSPECTION OF THE REPUBLIC OF KOREA

BACKGROUND

The emergence of new technologies and disruptive knowledge, including Information and Communication Technology (ICT), Artificial Intelligence (AI) and big data, has led to the transformation and development of the industrial structure, rapidly changing labour markets. With the drastic increase in work automation brought by the advancement of technologies, "around 15 percent of the global workforce, or about 400 million workers, could be displaced by automation in the period 2016-2030… that figure rises to 30 percent, or 800 million workers."[85]

Emerging industries: Virtual Reality (VR), Augmented Reality (AR), drone, big data analysis, Artificial Intelligence (AI), and eco-friendly vessels

8 leading industries (major national projects): smart factory, bio and health industry, Fin Tech, future car, smart city, smart farming, new industries in the energy sector, drone

Against this backdrop, the Korean government has made enormous policy efforts to support higher education institutions (high schools, college, and universities) to nurture a competent workforce with the skills and knowledge necessary to enter new industries.

In this light, the Board of Audit and Inspection (BAI) decided to check if such policies have been well implemented to nurture a competent work force by reflecting changes in the industrial structure and labour market. To this end, the BAI audited the status of vocational training (secondary and post-secondary education) that aimed at developing and enhancing certain competency and vocational skills for professions.

Also, it examined if post-secondary education institutions established to foster a highly qualified workforce in specialized areas including the maritime, transport sectors, or for Industry-Academy cooperation (called as special purpose universities) have been operated to meet their purpose of nurturing the workforce that would respond to ever-changing industrial environment.

The BAI conducted an audit on "Operation and Management of Vocational Training" in 2019 to check vocational training policies put forward by the MoE in a response to the 4th Industrial Revolution. Additionally, it conducted an audit on "Workforce Development in Special Purpose Universities" in 2020 to check the appropriateness of post-secondary vocational training and suggest improvement measures.

1. OPERATION AND MANAGEMENT OF VOCATIONAL TRAINING

AUDIT DETAILS[86]

Vocational training refers to education and training that supports students in acquiring or enhancing the competencies and capabilities required for a particular job function. It is composed of secondary vocational training that targets vocational high schools (specialized high schools[87] and Meister high schools)[88] and post-secondary vocational training that provides career-oriented programs and courses geared for students in community colleges and universities.

BAI conducted an audit on four government organizations, including the MoE, which is responsible for vocational training. To check whether vocational training policies were adequately designed and operated in alignment with their objectives, BAI examined the following: on-site training which prioritizes students' learning and safety, performance evaluation of specialized high schools, and LINC+ projects.[89]

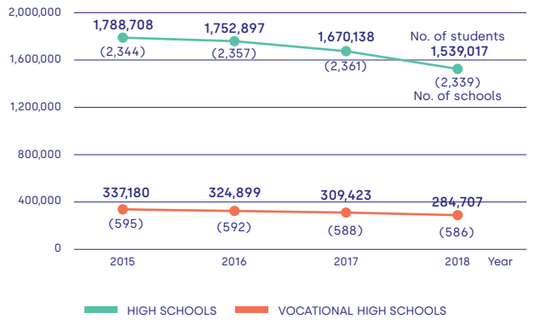
In order to assure BAI's audit quality and strengthen the audited organizations' acceptance of the audit results, BAI gathered the opinions of students and faculty members through a survey. During the audit, BAI employed various audit approaches, such as analyzing the enrollment and employment rates as well as the performance evaluation indicators of specialized high school students for the last three years (from 2016 to 2018).

KEY FACTS

Status of Vocational Training in Korea
Secondary vocational training

The number of vocational high school students was 284,000 (18.5% of high school students nationwide) while the number of vocational high schools stood at 586 (24.8% of the total number of high schools). With the school-age population declining, the numbers of vocational high schools and their students have decreased accordingly.

FIGURE 64:
NUMBER OF VOCATIONAL HIGH SCHOOLS AND STUDENTS



In a similar vein, the government's special grants for vocational high schools have also decreased, with the resultant decline in the average grant amount allocated for each school.

The total amount of special grants for vocational high schools countrywide in 2018 fell to KRW 115.3 billion from KRW 131.8 billion in 2015.

The average amount of special grants per vocational high school was KRW 190 million in 2018, down from KRW 220 million in 2015.

Post-secondary vocational education

The number of community college students stood at 659,000 (25% of the total number of undergraduate students) and the number of community colleges was 137 (42% of colleges countrywide). Among community colleges, private ones accounted for 93%, and the number of students in private community colleges amounted to 646,000 (98% of community college students).

As for the 'Demand-driven type' LINC+ (Leaders in INdustry-university Cooperation) project,[90] the MoE has awarded KRW 84.3 billion and KRW 102.7 billion to 65 colleges in 2018 and 2019, respectively (average of KRW 1.5 billion per college).

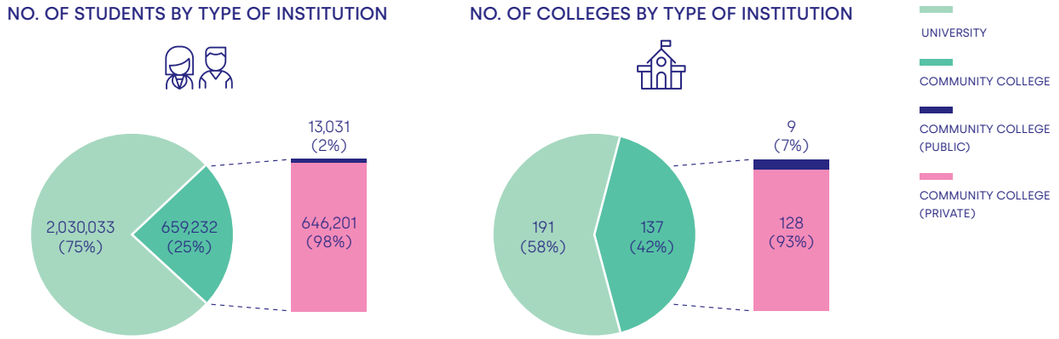
KEY FINDINGS

Improper operation of on-site training for students of vocational high schools

The MoE had operated the "Work-Study Dual System (work-based learning system)" to assist students to better adapt to the workplace by providing on-site experience related to the training curriculum and increasing employment rates for young individuals. However, students were exposed to various hazards that could potentially risk their health and safety while working at the companies that participated in the on-site training program. The MoE concluded that such problems were caused by participating companies who exploited students only as source of labour, and therefore, in 2018, introduced the on-site training prioritizing learning and safety.

BAI examined whether the "on-site training prioritizing learning and safety" operated in accordance with its objectives of strengthening students' safety and promoting their job competency. The auditors found that, under this newly-introduced training program, the students were not considered employees, and therefore, their occupational safety and health were not guaranteed (as stated in the Occupational Safety and Health Act). They were also being paid less than the minimum wage,

FIGURE 65:
NUMBER OF COLLEGES AND THEIR STUDENTS BY TYPE OF INSTITUTION



and with the duration of the on-site training shortened (from 6 months to 3 months), students were deprived of sufficient time to adapt to their future workplace accordingly. This led to a decline in the employment rate.

Audit methodology: Survey on the operation of on-site training program

- Overview: Conducted an anonymous survey (of 16 questions) among 28,893 graduates, students and faculty members of vocational high schools via email (response rate was around 10%)

- Focus: checked whether safety measures for students during on-site training have been strengthened and on-site trainings were operated in a way not to undermine employment and capacity development

-Sample question
Q. Do you think the "on-site training prioritizing learning and safety" was sufficient to protect human rights and the safety of students?
1. Strongly agree
2. Agree
3. Undecided
4. Disagree
5. Strongly disagree

Q. If you chose 4 or 5 to the question above, what is (are) the reason(s)? (Select all that apply)
1. Lack of standards and expertise pertaining to occupational safety and health when selecting companies for on-site training
2. Lack of education on human rights and occupational safety and health for students and companies participating in the on-site training
3. Lack of curriculum or inappropriate training conditions of the participating companies
4. The burden of carrying out both study and work during the on-site training
5.Other (please specify)

Q. After graduation, how helpful was the on-site training in an actual work environment?
1. Extremely helpful
2. Helpful
3. Moderately helpful
4. Not very helpful
5. Not at all helpful

Due to insufficient cooperation between the MoE and the Ministry of Employment and Labour (MoEL), 327 companies with high incidences of industrial accidents or unpaid wage issues were selected for on-site training when their participation should have been restricted.

Improper performance evaluation on the operation of specialized high schools

There are 17 metropolitan and provincial offices of education nationwide. These education offices provide financial supports for designated specialized high schools and decide whether to maintain or revoke the designation every five years through performance evaluations on their operation. To better assess the operational performance of specialized high schools, the MoE suggested "employment rate" and "percentage of career-focused courses" as the most important indicators.

In 2014, not implementing the guidelines of the MoE, Gyeonggi and North Jeolla Provincial Offices of Education adjusted the scores and class intervals[91] of major indicators lower than the MoE's suggestion, including "employment rate" and "percentage of career-focused courses," undermining the reliability of the performance evaluation results. For instance, regarding the employment rate of specialized high schools, the MoE suggested the topmost class interval as "60% to 100%." Gyeonggi and North Jeolla Provincial Offices of Education designated the lower limit of the topmost class interval to be 55% and 40%, respectively.

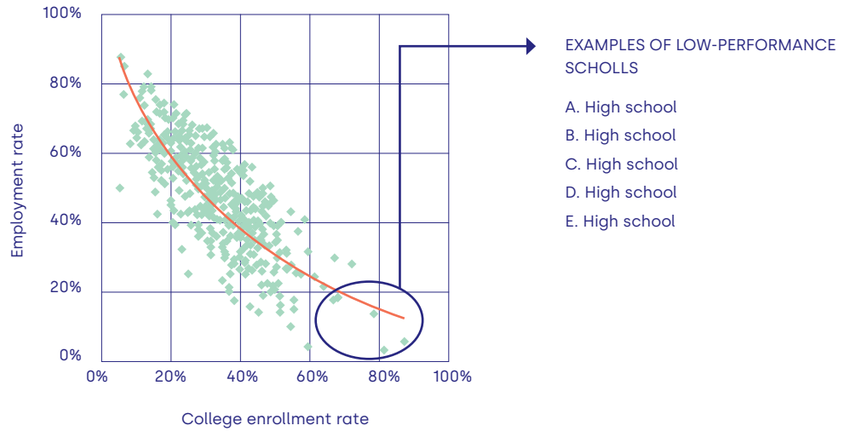
TABLE 5:
Scores and class intervals of major indicators used by Gyeonggi and North Jeolla Provincial Offices of Education in 2014

Category	Employment rate						Career-focused courses					
	MOE (reference figure)		Gyeonggi Provincial Office of Education		North Jeolla Provincial Office of Education		MOE (reference figure)		Gyeonggi Provincial Office of Education		North Jeolla Provincial Office of Education	
	Score	Class interval	Score	Class interval	Score	Class interval	Score	Class interval	Score	Class interval	Score	Class interval
Highest	20	60% ≥	13.33	55% ≥	15	40% ≥	10	60% ≥	3.33	60% ≥	15	60% ≥
Lowest	6	< 30%	4	< 25%	8	< 10%	2	< 45%	0.66	< 45%	7	< 45%
Gap between the highest and lowest	14	-	9.33	-	7	-	8	-	2.67	-	8	-

In 2019, North Jeolla Provincial Office of Education set the baseline for the lowest class interval (40%), lower than the percentage of career-focused courses that are required to be included (47.8%). All schools, thereby, obtained higher scores.

This is against the purpose of operating specialized high schools, and concerns have been raised that specialized high schools may only enjoy financial benefits, but fail to provide career-focused education, without being differentiated from general high schools that would pursue academic careers over fostering a future workforce. In effect, according to the analysis on the employment rate and enrollment rate of specialized high schools nationwide, five specialized high schools, including the A High School, demonstrated high enrollment rates and low employment rates.

FIGURE 66:
Average employment and enrollment rates of specialized high schools nationwide (from 2016 to 2018)



Improper health and safety management of labs in the vocational high schools

Since experiments and hands-on training account for a high percentage of vocational high schools' curricula, students have been exposed to various hazardous substances, risk factors and constant laboratory accidents. This fact is also confirmed by the findings on the status of safety accidents in vocational high schools over the last three years (2016-2018). Experiments and hands-on training were the second most common cause of accidents (the most common cause of safety accidents was sports-related activities with 7,863 cases)

Compared to college laboratories or industrial laboratories,[92] there has been no regulation in place to provide vocational high school students with safe lab environments, such as standards for safety and health management requiring periodic measurements of students' exposure to 190 hazardous chemicals. Nevertheless, the MoE has not introduced any guidelines for the establishment and operation of labs in vocational high schools. After on-site inspection of the labs in vocational high schools, BAI identified several cases of poor health and safety management (such as those related to distribution and wearing of safety devices) and exposure to harmful factors that exceed the average exposure level of industrial companies.[93]

Audit methodology: *Examinations of safety and health management and on-site measurement of exposure to harmful factors*
- Overview: Conducted on-site examinations of 46 vocational high schools, including F High School
- Focus: examined the status of safety and health management of students, especially regarding machinery, devices, and equipment furnished in the labs, and to measure the level of harmful chemicals in the labs, such as iron oxide

FIGURE 67:
RISK FACTORS THAT CAN LEAD TO SAFETY ACCIDENTS IN VOCATIONAL HIGH SCHOOL LABS

Insufficient ventilation system in a soldering lab

Unlabeled hazardous chemicals

Insufficient management of personal protection device

Improper operation of LINC+ projects (demand-driven type)

With an aim to alleviate youth unemployment and labour shortage for companies, the MoE launched a demand-driven type LINC+ project. This project allows colleges to jointly design and operate curricula with companies that entered agreements with the colleges, providing students with an opportunity to pursue their careers in the companies after graduation. Therefore, it is essential to enhance the performance of participating education institutions by setting the "students' employment rate in companies that signed agreements through LINC+ projects" as one of the major indicators in project performance assessment and award differentiated grants to the selected educational institutions according to the evaluation results. However, community colleges and universities place less importance on the "employment rate at contracted companies" giving 4 points and 7 points out of 100 points, respectively. Additionally, the gaps between the highest and lowest points for the employment rates of community colleges and universities were a mere 0.9 points and 3.2 points, respectively, nullifying the benefits of grouping students' employment rates in companies that participated in the LINC+ project. As a result, some colleges with low employment rates ranked high in the final results.

Some community colleges and universities used the "level of achievement in the target employment rate of each college/university" in place of the "students' employment rate in companies that signed agreements through LINC+ projects." In doing so, the colleges and universities that set low targets gained higher scores in the performance evaluation.

Though G University had a lower employment rate when compared to H University, it obtained a perfect score (0.6 points higher than that of H University) by setting the target employment rate low.

TABLE 6:
Scores and class intervals of the indicator (the employment rate) proposed for community colleges and universities

Category	Score (total score)	Class intervals and scores of "students' employment rate in companies that participated in the LINC+ project"				
		Lowest		Highest		Gap between the highest and lowest scores
		Class interval	Score	Class interval	Score	
Community college	4 (100)	< 50%	3.1	100% ≥	4	0.9
Univesity	7 (100)	< 70%	3.18	100% ≥	7	3.2

KEY RECOMMENDATIONS

Improper operation of on-site training for vocational high school students

BAI recommended that the Minister of Education, in consultation with the MoEL, prepare measures to strengthen the safety inspection for the companies participating in the on-site training, such as by expanding engagement of occupational safety and health professionals in the on-site training consultative group established in each office of education. BAI requested the MoE to develop measures to increase on-site training participation rates and employment rates by, for example, adjusting the timing and duration of the training and wage of participating students. Moreover, the MoEL and MoE should present measures to share information on companies whose application for on-site training has been restricted to prevent students from having on-site training in such companies.

Improper performance evaluation on the operation of specialized high schools

BAI notified the superintendents of Gyeonggi and North Jeolla Provincial Offices of Education to establish measures to ensure that specialized high schools operate in accordance with their original purposes: strengthening career-oriented education and increasing the employment rate. To this end, education offices should amend the scores and class intervals of key indicators, "employment rate" and "percentage of the career-oriented courses," to reflect the actual operation of specialized high schools in the performance evaluation results.

Improper safety and health management of labs in the vocational high schools

BAI recommended that the Minister of Education formulate safety measures that can be applied to laboratories in vocational high schools to maintain and enhance their students' safety and health by managing harmful factors through regular measurement and conducting safety and health inspections. Further, the MoE should introduce measures, including standards, to guide and monitor the establishment and operation of labs in vocational high schools.

Improper operation of LINC+ projects (demand-driven type)

BAI recommended the Minister of Education to create measures to place greater importance on the indicator related to employment in the performance evaluations, such as by allocating more points to the "employment rate at the contracted companies" and increasing the width of class intervals.

2. WORKFORCE DEVELOPMENT IN SPECIAL PURPOSE UNIVERSITIES

AUDIT DETAILS

Special Purpose Universities (SPUs)[94] are designed to foster a competent workforce in specialized fields. Among them, the audit targeted the Korea Maritime and Ocean University (KMOU), Mokpo National Maritime University (MMU), Korea National University of Transportation (KNUT), and Kumoh National Institute of Technology (KIT). The audited universities also included the Seoul National University of Science and Technology (SeoulTech), former Gyeongnam National University of Science and Technology (GNTech), Hanbat National University (HBU), and Hankyong National University (HKNU), which were operated as 'Industrial Colleges'[95] and transformed into general universities/colleges in early 2010s with an aim to foster a competence workforce for local industries.

Meanwhile, the audit focused on inspecting whether the SPUs have pursued their purpose of establishment and functions to cultivate a high-quality workforce. To this end, the audit used the analysis framework,[96] which included operation of workforce development plan and curriculum, securing of condition for education,[97] and workforce development performance as the criteria for inspection.

TABLE 7:
Inspection criteria and details to analyze workforce development

Category	Inspection criteria	Inspection details
Operation of workforce development plan and curriculum	Appropriateness of operating specialization plan and curriculum	· Are specialization plan and curriculum operated as planned and with consistency? · Are Specialized curriculums operated in accordance with changing environment such as the 4th Industrial Revolution? · Are curriculums activated in connection with local industries?
Securing of conditions for education	Appropriateness of condoitions for education	· Do the SPUs have enough conditions to provide high-quality education? · Rate of full-time faculties, research competency of faculties, cost of education per student, record of winning government-funded projects
Workforce development performance	Appropriateness of employment rate, enrollment rate, and fields for workforce	· Employment and enrollment rates · Are workforce developed to serve their specialized fields? · Are workforce provided to meet the needs of local industries?

KEY FACTS

Status and major issues of SPUs

Among national universities,[98] the audited SPUs fall under small and middle-sized regional universities with about 10,000 students. Most SPUs are tech-oriented, but some SPUs, such as HKNU and KNTech, have focused significantly on natural sciences because they had centered on agricultural studies when they were industrial colleges.

These universities are facing the demands to strengthen competitiveness in a changing environment where the higher education system should respond to the decline in the school-age population and the Fourth Industrial Revolution. In particular, six universities, except SeoulTech and HKNU, are located outside metropolitan areas, making it even harder for them to strengthen competitiveness due to difficulties in student recruitment.

In this context, such SPUs have sought for solutions to overcome the potential decline of their regions, resulting from the concentration of youth populations in larger metropolitan areas, including: helping regional development based on regional universities; promoting various policies to foster a competent workforce in the region; and implementing a development strategy connected to not only the specialized fields (transportation, maritime, technology, etc.), but also local industries.

KEY FINDINGS

Improper operation of workforce development plans and curriculum

Lack of stability in curriculum operation due to insufficient efforts to secure own source of funds

The SPUs need to establish specialization strategies and implement them with consistency in accordance with the goals of fostering a qualified workforce in specialized areas. However, the operation of a specialization curriculum is highly dependent on government funds,[99] making it difficult to ensure a stable operation.

Therefore, such universities should develop measures to secure their own financial resources other than government funds, while the MoE should reflect SPUs characteristics in designing the evaluation criteria for government-funded projects.

However, though the largest share of their own revenues is from tuition fees, the Higher Education Act restricts an increase in tuition. Therefore, the SPUs need to expand the "Industry-Academy Cooperation Foundation Accounts" which can be secured through their own efforts, for example, by promoting expansion in industry-academy cooperation. However, in such universities, the revenues from the "Industry-Academy Cooperation Foundation Accounts" only account for 19.3%, significantly below other regional or major national universities.

TABLE 8:
Revenues of SPUs (average between 2017 and 2019, KRW 100 million, %)

Category	University Accounts	Development Fund Accounts	Industry-Academy Cooperation Foundation Accounts	Total revenues
SPUs	1,103 (78.2)	35 (2.5)	272 (19.3)	**1,410**
Regional universities	1,374 (76.3)	26 (1.4)	402 (22.3)	**1,802**
Major national universities	2,907 (66.6)	166 (3.8)	1,291 (29.6)	**4,364**

Note: Revenues of national universities consist of "transfer income" and their "own income." The transfer income has specific purposes for use (operational costs, including labour costs). Tuition represents the largest share of their own income, but the Higher Education Act places a limit on increasing the rate of tuition fees. Development Fund Accounts, of which the major source is endowment, are difficult to expand thorough short term effort.

Also, although their positive fund balances which could be used for operating curriculum stood at KRW 6.3 billion, and represented higher share (5.7%) than that of other regional universities (4.9%) or major national universities (2.9%), these universities were found to depend heavily on government funds without considering the use of positive fund balances. Moreover, the MoE did not reflect the characteristics of SPUs when evaluating government-funded projects, thus disadvantaging the SPUs in the evaluation against other general universities and making it difficult for them to secure government funds.

The four SPUs that were converted to general universities from industrial colleges still have a lower rate of full-time faculty members than the legal requirement (80%) for general universities because industrial colleges set the legal requirement for full-time faculty rate at 50% in the past. However, they are evaluated with the same indicator as general universities during the annual evaluation for universities' innovation support projects, leading them to receive the lowest scores.

Since the former GNTech and HKNU were highly dependent on government funds, they were found to operate their curriculums poorly or differently from the original plan of specialization after failing to be selected as a MoE -funded project for SPUs in 2015.

Lack of curriculums for fostering STEAM[100] -powered workforce in response to Fourth Industrial Revolution

As of 2020, seven SPUs (such as the KNUT) have been operating 39 STEAM curriculums in connection with specialization curriculums to foster a STEAM-powered workforce, bracing for the Fourth Industrial Revolution.

To this end, the SPUs need to develop measures to encourage the involvement and participation of students, faculty members and related industries, and provide onsite training that can be used as a reference for solving problems in an actual worksite. However, the audit found that the curriculums lacked the following:

Reflecting the needs of students and industries: *Among 39 STEAM curriculums provided by 7 SPUs, only two courses (5%) of the KNUT reflected the demands of students, while a mere 17 courses (44%) in five SPUs reflected the demands of industries.*

Providing inducements for participants: *There were not enough measures to encourage participation. Only four SPUs (including the KNUT) provided incentives, such as scholarships for participants, and only KIT provided research allowances for participating faculty members.*

Industry-Academy Cooperation: *Out of 39 STEAM curriculums in seven SPUs, only 18 courses (46%) operated onsite training, while only nine STEAM courses were operated based on the contracts with industries on the curriculum and future employment.*

Accordingly, among 23 STEAM curriculums with a fixed number of students per course from 2016 to 2020, only 11 courses (48%) satisfied over 50% of student recruitment rates (students enrolled/fixed number of students per course). The operational performance was also low during the same period: seven out of the 36 STEAM curriculums showed over 30% of wastage rates (number of failed or dropout cases out of students enrolled).

Meanwhile, in addition to the STEAM education, the MoE has been providing support for establishing or expanding departments related to high technologies with an aim to develop qualified workforce for the Fourth Industrial Revolution.

However, although the MMU, as a beneficiary of Industry-Academy Cooperation Project sponsored by the MoE to foster high-tech workforce, has enough conditions to create new departments, and needs to do so for continued specialization in high-technology areas, it hasn't considered creating new high-tech departments, unlike other SPUs such as the KMOU.

Lack of curriculums connected to local industries in some SPUs

As a result of examining industry-academy cooperation performances[101] of SPUs between 2017 and 2019, most SPUs displayed higher performances than other regional universities and major national universities, as follows:

Onsite training: *MMU (19.9%), HBU (9.9%) and KIT (8.2%) recorded higher rates of onsite training participation than the average rates of regional universities (6.3%) and major national universities (4.6%).*

Capstone Design: *KNUT (39.7%), KIT (35.1%), HBU (27.7%), and KMOU (21.1%) displayed significantly higher rates of Capstone Design project participation than the average rates of regional universities (17.1%) and major national universities (11.4%).*

Contracted departments: *Some SPUs such as KMOU (285.3 students), HBU (242.7 students), and KIT (149.3 students) are actively taking advantages.*

On-demand curriculum: *MMU (206.3 students) showed the highest performance, operating the LINC+ project.*

However, the HKNU and the former GNTech performed poorly, showing an onsite training participation rate of 0.3% and 1.5%, respectively, even after the MoE had recommended that they focus on industry-academy cooperation in connection with local industries during the conversion from industrial colleges to general universities.

Insufficient conditions of education

Based on the open data on universities/colleges for the past three years, the audit compared and analyzed the conditions for education of the SPUs, which include the number of full-time faculty members, faculty's research capacity, cost of education per student, record of winning government-funded projects, etc. with other regional universities and major national universities.

As seen in Figure 5, the four SPUs including the SeoulTech which were transformed from industrial colleges into general universities, showed lower full-time faculty rate than those of other regional universities and major national universities. As for the number of research paper per full-time faculty member, all SPUs except the SeoulTech and the KNUT displayed lower rates.[102]

Figure 68 showed that all the SPUs recorded lower performance in terms of government-funded projects than other regional universities and major national universities. As for the educational cost per student, all the SPUs (except the MMU)[103] also displayed poor results.

Meanwhile, the HKNU and GNTech consistently recorded low performances in all indicators related to the conditions of education. Therefore, prompt actions are needed to improve the conditions of education.

Insufficient workforce development performance in some SPUs

Workforce development in priority sectors

The audit examined the status of workforce development in specialized fields, especially the engineering sector on which the audited SPUs have mainly focused. The SPUs were found to cultivate workforce in priority sectors[104] as seen in Figure 7. The higher number of SPU graduates with engineering majors were able to find jobs between 2017 and 2019, in industries such as manufacturing, transport and warehousing, construction, science and technical services, IT, etc.

However, though the KNUT has operated theoretical courses for aviation maintenance since 2017 for students desiring to work in the field of aviation maintenance, it has not provided practical training required to apply for the qualification test to be an aircraft maintenance technician. Therefore, it has failed to foster a professional workforce in the field of aviation maintenance.

Workforce development for local industries

The SPUs are aimed at developing a workforce for both the specialized areas and for local industries in accordance with the government's policy direction that emphasizes the role of national universities in building a regional innovation system to achieve balanced development throughout the nation. However, though the KIT and the KNUT stressed specialization and workforce development in connection with local industries in their missions, most graduates found jobs in metropolitan areas (Seoul,

FIGURE 68:

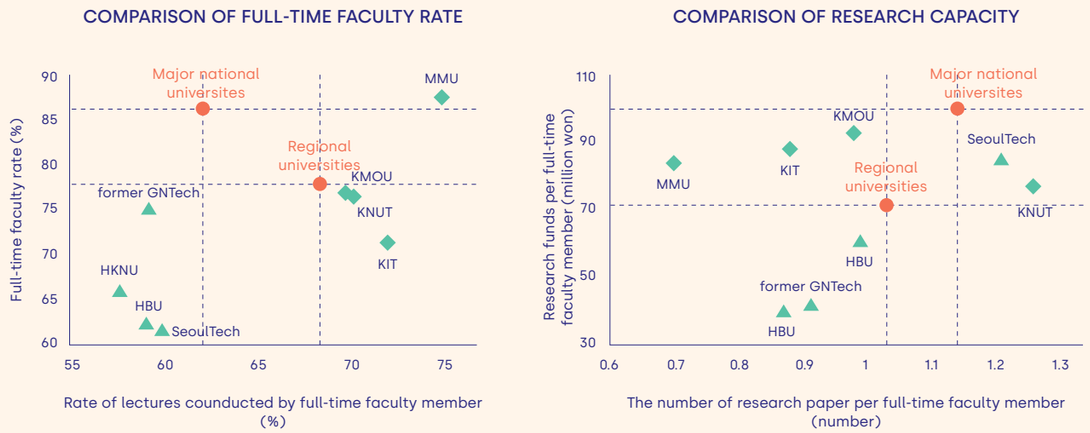


FIGURE 69:
Education cost per student and performance of government-funded projects[105]

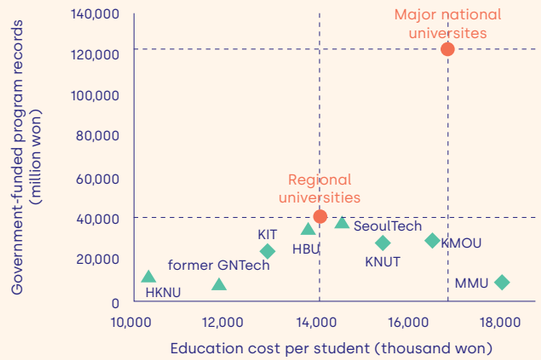
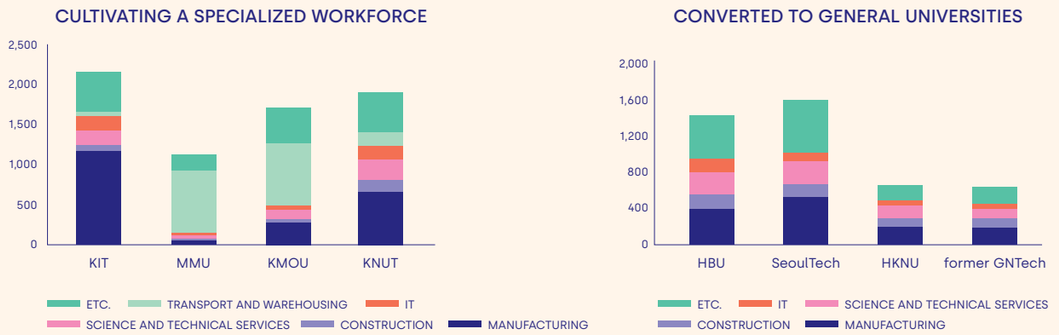


FIGURE 70:



Gyeonggi, Incheon), which differ from the direction of SPU's workforce development strategy

KIT: *The KIT set its major mission as "A university growing with its regional communities in Gyeongbuk and Gumi" in its mid- and long-term development plan. However, out of a total of 2,158 graduates that successfully landed jobs between 2017 and 2019, the number of those getting jobs in the metropolitan area (888 persons, 41.1%) was higher than that of the adjacent areas of Daegu and Gyeongbuk (743 persons, 34.4%).*

KNUT: *It also emphasized industry-academy cooperation, especially in the Chungbuk region, through its mid-and long-term industry-academy cooperation development plan. However, out of a total of 1,900 graduates that successfully landed jobs in the engineering sector between 2017 and 2019, the number of those getting jobs in the metropolitan area (1,040 persons, 54.7%) was higher than that of the Chungcheong region (615 persons, 32.4%).*

KEY RECOMMENDATIONS

Improper operation of specialization curriculum

Lack of stability in curriculum operation due to insufficient efforts to secure own source of funds

The MoE needs to induce the SPUs to expand stable financial resources necessary for the operation of specialization curriculums by encouraging them to secure their own funds, and examine the development of government-funded projects that would reflect the characteristics of SPUs.

Lack of curriculums for STEAM-powered workforce development in a response to the Fourth Industrial Revolution

The MoE needs to consider measures to encourage the SPUs to operate STEAM curriculums with substance by reflecting demands of students and industries, providing incentives for participants, and rightly evaluating the industry-academy cooperation.

To cultivate a future workforce related to the Fourth Industrial Revolution, the MMU should develop measures to actively respond to the demand of fostering a workforce in the field of high-technology by newly creating/increasing departments for high technologies and adjusting the number of students per department.

Lack of curriculums connected to local industries in some SPUs

The MoE needs to encourage the former GNTech and the HKNU, which were found to be insufficiently operating the curriculums connected to local industries to vitalize their connection with local industries during the examination of the implementation for action plans for an integrated Gyeongsang National University, and the process of integration between the HKNU and the Korea National University of Welfare.[106]

Insufficient conditions of education

The MoE needs to continuously increase the number of faculty members in the four SPUs that were converted from industrial colleges to general universities. By reflecting their characteristics into the evaluation of government-funded projects, the MoE should prevent them from disadvantaging themselves in the bid for government-funded projects.

For the former GNTech and the HKNU, which were analyzed to have poor conditions of education, the MoE needs to consider measures that encourage them to improve their conditions of education during the examination on the implementation for action plans for an integrated Gyeongsang National University, and the process of integration between the HKNU and the Korea National University of Welfare.

Insufficient workforce development performance in some SPUs

The MoE needs to take multi-faceted efforts by continuously encouraging the SPUs to cultivate a workforce in the priority sectors, while developing locally tailored workforce development strategies in connection and collaboration with local governments and players.

Meanwhile, in order to systematically develop the workforce in the aviation maintenance sector, which is essential for the national transport industry, the KNUT is recommended to develop measures to support their students to acquire qualifications for aircraft maintenance technicians by providing both theoretical courses and practical training.

CONCLUSIONS

BAI conducted audits on vocational training in secondary and post-secondary education institutions to examine whether the training programs have achieved their goal of nurturing the workforce in response to the ever-changing industrial environment. Through the audit of the operation and management of vocational training, BAI identified several problems, including the improper operation of on-site training for vocational high school students and/or inappropriate performance evaluations of the LINC+ projects. Based on these, BAI recommended related organizations to develop measures to improve the identified problems.

Through its audit on status of workforce development in the SPUs, BAI found cases, including those failing to operate the SPUs in accordance with their purposes of establishment, as well as those displaying poor performances in implementing the specialization strategies and fostering local workforce. Based on such findings, BAI recommended the MoE to refer to the cases for policy development and implementation, as well as to come up with improvement measures.

As a result, BAI contributed to the government's efforts to ensure that students are well-equipped with the skills and knowledge they need to respond to emerging industries and changes in the labour market.

3RD THEME:

03

DIGITAL SKILLS

3RD THEME: DIGITAL SKILLS[107]

Digital literacy was identified in studies as one of the seven most necessary and essential skills of the 21st century,[108] equal in importance to literacy and numeracy. In an age of a unique, rapid technological revolution, employees who can work in a digital environment and adapt rapidly to technological changes are expected to have a significant advantage. Analysis of job postings in recent years (2016/19) shows that a large majority of jobs required the use of digital means to a certain degree, as well as basic digital literacy. For example, more than 90% of European employers required at least basic digital literacy of managers, professionals, technicians, clerical workers, and skilled agricultural workers; and 80% demanded it from sales workers.[109] Employers in the United States required digital literacy for almost every position, and in Europe employers ranked "working with computers" as the second most important skill.[110]

Around the globe, people with high levels of digital literacy enjoy better employment chances and higher wages. Accordingly, employees with medium and high digital literacy levels earn an average of 27% more than employees with low literacy levels, and in certain countries, like Britain, Singapore and the United States, the gap is 50% or higher. The OECD estimates that the connection between good digital literacy and higher wages will increase in the future.[111]

Digital literacy is also required for participation in a variety of other activities, such as exercising rights and using online government services, and for online learning, including the upgrading of employability and occupational skills.

The importance of imparting digital literacy at various stages in life: Many digital skills can be imparted to children and youths before they enter the labour market. These digital skills, together with skills for independent learning, will allow them to continue updating their digital literacy throughout their lives as technological changes occur.

Working-age adults need to develop their digital literacy too: studies have shown that occupations that use computers more frequently are at lower risk of automation,[112] and the demand for workers in those occupations is growing at a faster rate. Consequently, workers with low digital skills and experience are at a higher risk of losing their jobs due to automation, and are most in need of support to improve their skills.

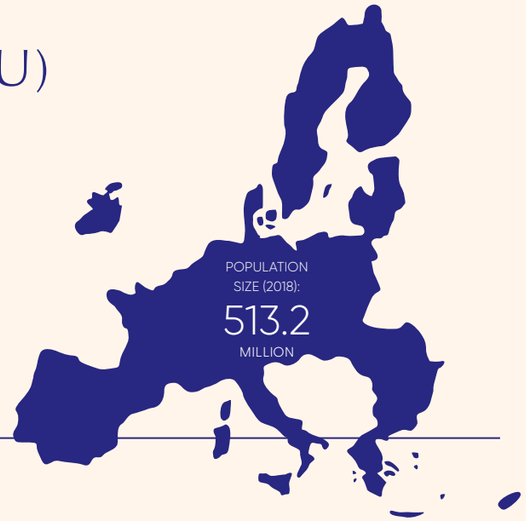
International focus on improving digital literacy: As part of target 4.4 of UN SDG 4, to substantially increase the number of youth and adults who have relevant skills for employment, indicators were set to measure the proportion of youth and adults with information and communications technology (ICT) skills, and the percentage who have achieved at least a minimum level of proficiency in digital literacy skills.[113] Similarly, the OECD identified the importance of developing digital literacy for all alongside improving the other basic skills of literacy and numeracy.

The EU too has dealt extensively with the issue, for example in its New Skills Agenda for Europe, Digital Education Action Plan, the Digital Competence (DigComp) framework, and the establishment of a coalition of states, companies, entities in the non-governmental sector and education providers to cope with the lack of digital literacy. Accordingly, certain countries adopted a national policy for digital literacy,[114] among them Portugal, the Czech Republic, Ireland, Italy and Norway.[115]

FIGURE 71:
The five areas of EU DigComp 2.0

Source: European Commission

EUROPEAN UNION (EU) BASIC WORKFORCE INDICATORS[116]



DEMOGRAPHY, ECONOMY, EMPLOYMENT

WORKING AGE POPULATION (2018):

64.6%

OF POPULATION

GDP (2019):

46,776$

US/CAPITA

EMPLOYMENT RATE (2019):

69.3%

OF WORKING AGE POPULATION

LABOUR FORCE PARTICIPATION RATE (2019):

80.3%

OF 25-64 YEAR OLDS

LABOUR PRODUCTIVITY (GDP PER HOUR WORKED - 2019):

54.3$

US

PART-TIME EMPLOYMENT RATE (2019):

16.5%

OF EMPLOYMENT

SELF-EMPLOYMENT RATE (2019):

15.3%

OF EMPLOYMENT

TEMPORARY EMPLOYMENT (2019):

13.6%

OF WAGE/SALARY WORKERS

SHARE OF JOBS AT HIGH RISK OF AUTOMATION OR SIGNIFICANT CHANGE (2019)

47.5%

(AVERAGE FOR 19 EU COUNTRIES FOR WHICH DATA IS AVAILABLE)

EMPLOYMENT IN HIGH- AND MEDIUM-HIGH TECHNOLOGY MANUFACTURING SECTORS (2019):

5.8%

OF EMPLOYMENT

EDUCATION, TRAINING, SKILLS

TERTIARY LEVEL EDUCATION (2019):

33.2%

OF 25-64 YEAR-OLDS

ADULT PARTICIPATION RATE IN FORMAL AND NON-FORMAL EDUCATION AND TRAINING (LAST 12 MONTHS - 2016):

45.2%

READING PERFORMANCE (15 YEAR-OLDS - PISA):

21.7%

AT PROFICIENCY LEVEL 2 OR BELOW (OF 6)

MATHEMATICS PERFORMANCE (15 YEAR-OLDS - PISA):

22.4%

AT PROFICIENCY LEVEL 2 OR BELOW (OF 6)

SCIENCE PERFORMANCE (15 YEAR-OLDS - PISA):

21.6%

AT PROFICIENCY LEVEL 2 OR BELOW (OF 6)

SHARE OF INDIVIDUALS WHO HAVE BASIC OR ABOVE BASIC OVERALL DIGITAL SKILLS (ADULTS - 2019):

58%

EUROPEAN UNION (EU) BASIC WORKFORCE INDICATORS

POLICY

Departments in charge of education and employment policy: European Commission Directorate General Education, Youth, Sport and Culture and Directorate General Employment, Social Affairs and Inclusion.

Public expenditure on active labour market measures (2017): 0.64% of GDP (average for 21 EU countries for which data is available).

Gross domestic spending on R&D (2018): 2.03% of GDP

MAIN TRENDS OR CHALLENGES & STRONG POINTS

Eurostat's main scenario projects that the pattern of population ageing within the EU -28 is likely to continue through to 2080, the median age of the EU-28's population is projected to increase by 4.2 years, from 42.4 years in 2015 to 46.6 years in 2080. The working-age population will shrink considerably between 2016 and 2080, thus further increasing the burden on those of working-age to sustain the dependent population (falling from 333.0 million persons at the start of 2016 (or 65.3% of the total) to 288.4 million persons by 2080 (55.6%) resulting in an overall projected reduction in the working-age population of 44.5 million persons,) with the share of the working-age population projected to fall below 60% by 2035 and to remain below this level through to 2080. In parallel, the proportion of elderly persons will become much larger.

The **Commission** states in its impact assessment accompanying its new ESF+ regulation (2021-27) that the number of entrants in initial education and training is already on the decrease. This decrease could be balanced, at least in the short to mid- term, by more investments into retaining children in school and up- and reskilling of adult working population to respond to the rapidly evolving skills requirements.

Across the OECD countries almost 14% of existing jobs are highly automatable (i.e., probability of automation of over 70%) and 60% of jobs face a moderate level of automation.

In addition, the education and training systems in the OECD countries face a challenge of ensuring inclusion of learners into society and the labour market, including migrants and lowskilled adults.

However, access to quality education, training and life-long learning opportunities across the EU is still unequal. 70 million Europeans lack adequate reading and writing skills, and even more have poor numeracy and digital skills, which puts them at risk of unemployment, poverty and social exclusion.

CEDEFOP's (European Centre for the Development of Vocational Training) study called "The Skills forecast: trends and challenges to 2030" explains Cedefop's skill supply and demand projections about the current structure of EU's labour market and potential future trends. Significant growth in employment for high-skill occupations (managers, professionals and associate professionals) is expected, together with some growth for less skilled jobs related to sales, security, cleaning, catering and caring occupations. Job losses are projected in medium-skill occupations, such as skilled manual workers (especially in agriculture), and for clerks. The continuing decline of employment in primary and manufacturing industries has an impact on many manual occupations, while the growth in employment in many parts of the service sector continues to benefit a number of non-manual occupations. A Eurofound analysis confirms the indications of the main results with regard to job polarisation, suggesting an increasingly polarised occupational structure in the EU, driven by strong growth at the bottom of the wage distribution. The analysis also highlights a shift towards more autonomy, less routine, more information and communication technology (ICT), fewer physical tasks, and more social and intellectual tasks over the forecast period to 2030. Medium-skill occupations are projected to see slow growth or even decline in the number of jobs, as automation and offshoring take their toll. But new workers will still be needed in these occupations to replace those who leave or retire.

SUMMARY REVIEW REPORT 7

EUROPEAN COURT OF AUDITORS (ECA)

EU ACTIONS TO ADDRESS LOW DIGITAL SKILLS

BACKGROUND

As the world becomes more and more digitalised, a certain level of digital skills is needed to manage with both private life and at work. In 2019, a third of adults in the EU in employment or looking for work did not have at least basic digital skills or had not used the internet at all during the previous three months. The consequences of this 'digital divide' are that adults with lower levels of digital skills more often face problems in finding a job; and when they do enter employment, they earn less than adults with higher levels of digital skills.

The EU's role in terms of increasing digital skills is to support national actions through guidelines and recommendations, providing support to cooperation networks and funding actions addressing this topic. The primary responsibility for the educational systems and vocational training, however, is with EU Member States.

KEY FACTS

1. In 2017, the European Skills Survey reported that basic digital skills are most commonly required in all occupations.
2. From 2015 to 2019, the level of basic digital skills has been moderately increasing at EU level in 21 out of the 28 Member States and in 2019, 35% of the EU labour force – representing more than 75 million people - did not have at least basic digital skills or did not use the internet.
3. At world-wide level, the level of digital skills in the EU is in line with other countries for which comparable data is available.
4. For the new period 2021-2027, for the first time the Commission has set a specific objective to increase the percentage of citizens with basic digital skills, from 56% in 2019 to 70% in 2025.
5. Although digital skills was a priority for the European Social Fund (ESF), training projects specifically addressing digital skills represented around 2% of total ESF funding in the 2014-2020 period.
6. For ERASMUS, after the ESF the second most important EU programme in relation to the upskilling of digital skills, the proportion of projects addressing the acquisition of basic digital skills by the adult population is less than 0.1%.

AUDIT ACTIVITIES/DETAILS

Given the importance of basic digital skills in many parts of the economy, and the high number of adults who do not have such skills, the objective of the review was to provide an overview and analysis of the different ways in which the EU supports Member States' efforts to improve this situation. We looked at what has been done since 2010, and set out the EU Commission's intentions for the next programme period, 2021-2027. Our aim was to draw attention to the importance of this issue and to set out potential high level challenges for those designing programmes and selecting projects for this period .

As this was not an audit report but a review, the information in the report is mainly based on publicly available information or material specifically collected for this purpose in cooperation with the European Commission. This information includes public documents related to basic digital skills, an analysis of EU budget allocation, and EU spending on upgrading the digital skills of adults to at least the basic level. For the European Social Fund, we analysed the use of the education and training thematic objective for basic digital skills to illustrate how operational programmes have rolled out the EU initiatives and target basic digital skills. We also examined the different ways of assessing and measuring digital skills by the European Commission and the OECD.

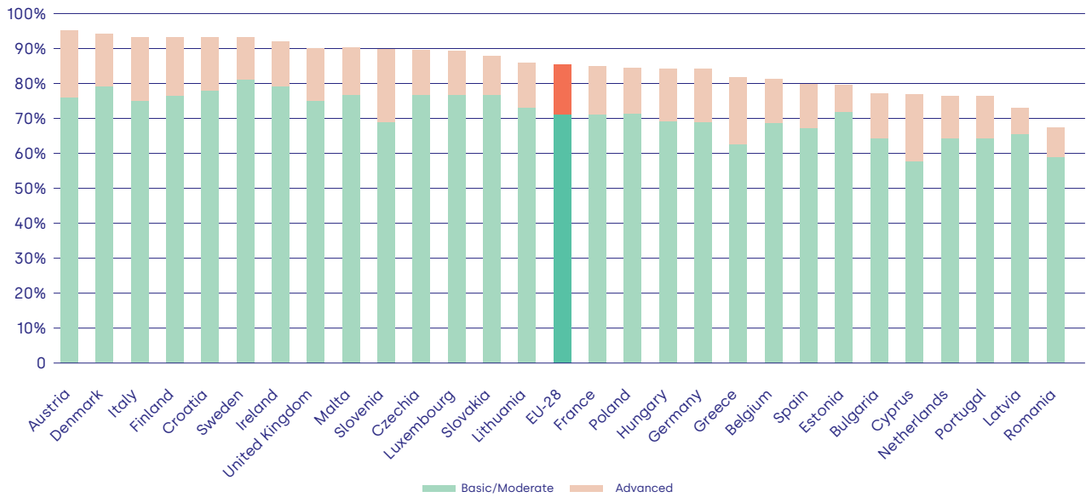
ANALYSIS

State of play

Digital skills needs in the EU

In the labour market the growth of digitalisation has resulted in an increased demand for digital skills in recent years, and this is expected to continue to grow in the future. The 2017 European Digital Skills Survey[117] reported that "in some job categories more than 90% of jobs require specific types of digital skills. Basic digital skills are the most commonly required in all the occupations." This survey found that the need for digital skills extended far beyond traditional desk-based work to jobs such as technicians and skilled agricultural workers. Specialist digital skills were required to a much lesser extent, and were related to specific sectors. According to a 2014 European skills and jobs survey,[118] over 70% of employees in the EU reported that they needed basic (19%) or a moderate level (52%) of ICT skills to carry out their job tasks.[119] Figure 72 shows the position in each of the EU's Member States.

FIGURE 72:
LEVEL OF ICT SKILLS NEEDED TO DO THE JOB



Note: Levels of digital skills were defined as follows: **basic** ICT level (using a PC, tablet or mobile device for emailing or internet browsing); **moderate** ICT (using word-processing or creating documents and/or spreadsheets) and **advanced** ICT skills (developing software, applications or programming, and using computer syntax or statistical analysis packages).

Source: Cedefop, European skills and jobs survey, 2014.

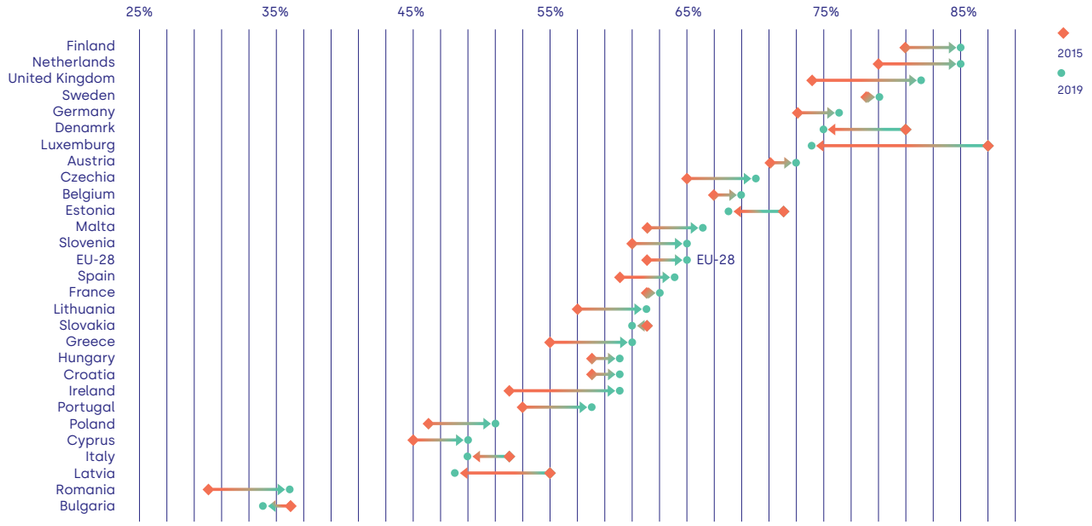
The European Digital Skills Survey also found that 15% of workplaces in the EU had digital skill gaps in their workforce. The gaps related to basic skills were more concentrated among technicians (22%), elementary occupations (21%), sales workers (20%) and clerical workers (17%),[120] illustrating the importance of basic digital skills for a wide range of occupations.

Level of digital skills in the EU

According to Eurostat's composite indicator, the level of basic digital skills has been gradually increasing in most Member States in recent years. Figure 73 illustrates the evolution of digital skills for the labour force from 2015 to 2019 for all Member States. In seven Member States, the proportion of adults with at least basic digital skills reduced slightly between 2015 and 2019.

Figure 73 also shows that, in 2019, 35% of the EU labour force, representing more than 75 million people, did not have at least basic digital skills (or their skills could not be assessed, because they had not used the internet in the last 3 months).

FIGURE 73:
PERCENTAGE OF THE LABOUR FORCE (25 – 64) WITH AT LEAST BASIC DIGITAL SKILLS

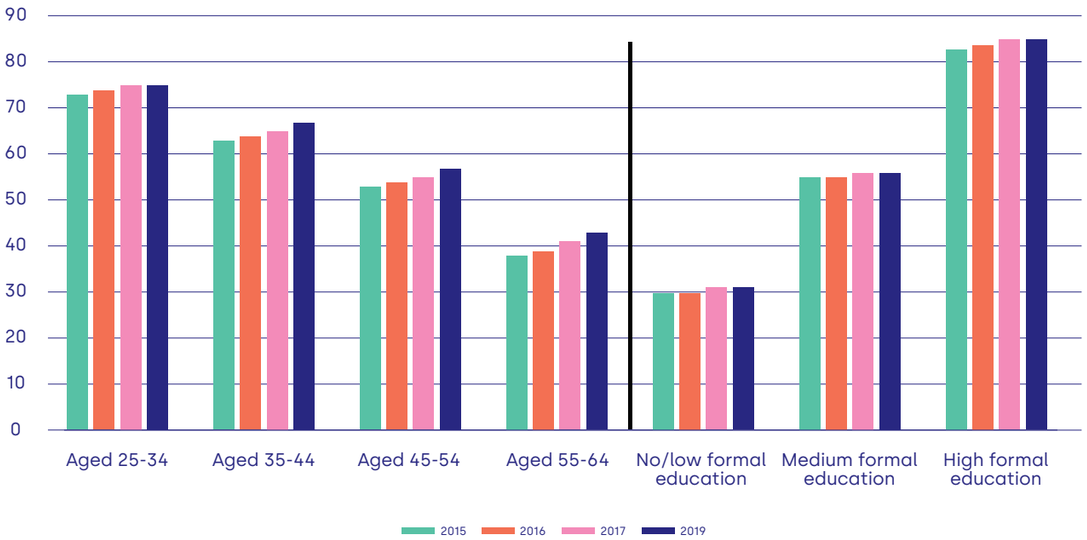


Note: According to Eurostat, for Czechia, Italy, Latvia and Luxembourg, the data collection method changed between 2015 and 2019. For Sweden the data for 2019 has low-reliability.

Source: EU Commission, Eurostat.

A number of factors contribute to the level of digital skills. These include physical infrastructure like the availability of computers and a good internet connection. OECD analysis[121] and also Eurostat data (Figure 74) show that, while gender differences are not particularly pronounced, educational attainment and age have an impact on digital skills. In most countries, many adults with low education lacked basic proficiency in the use of ICT, while these skills were nearly universal among adults with tertiary education. In terms of age, the ICT skills of people over 30 in the sample deteriorate progressively with age. Another factor contributing to skills difference is the employment situation. Our analysis showed that there is a clear, and growing, gap in the digital skill levels of those in employment and the unemployed.

FIGURE 74:
PERCENTAGE OF PEOPLE IN THE EU WITH AT LEAST BASIC DIGITAL SKILLS, BY AGE AND BY EDUCATION LEVEL



Source: EU Commission, Eurostat.

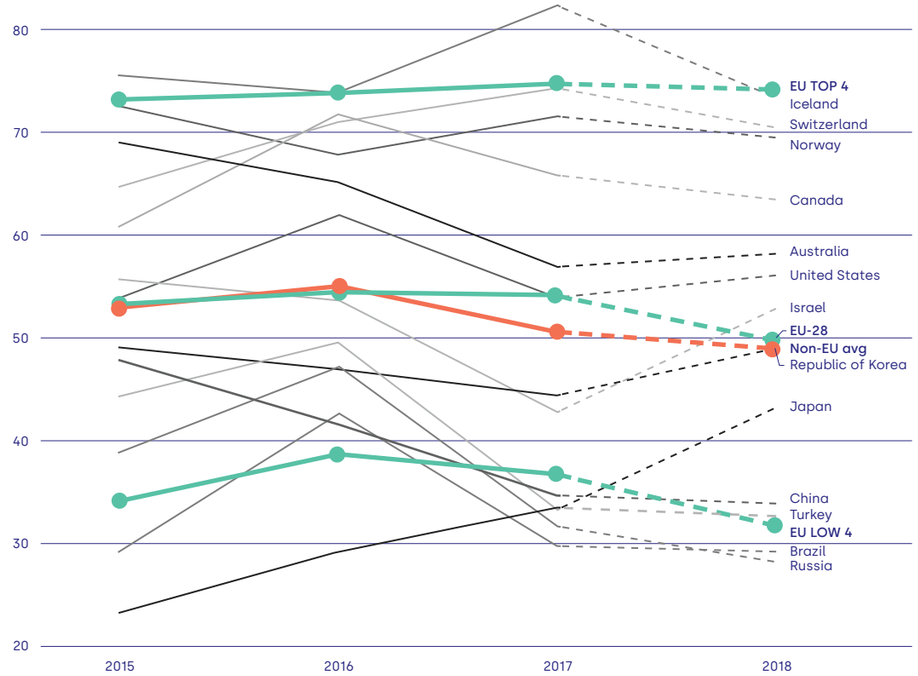
World-wide comparison of digital skills levels

The international version of the DESI (I-DESI) provides an overall assessment of where the EU stands compared to some non-EU economies.[122] While it uses indicators measuring similar variables, in contrast to DESI, which uses primary sources, I-DESI relies on a range of secondary sources of evidence.

I-DESI is a less sophisticated indicator than DESI, but enables a broad overview of how countries compare.

Figure 75 provides an overview of how EU Member States as a whole, and the top and bottom four Member States, rank against non-EU comparators with regard to basic digital skills for the period 2015-2018. Overall, the assessments for EU Member States are in line with the other countries: the averages of these two groups were very close in 2018, and over the period the rankings of the top and bottom four Member States have been in line with those of the best and worst performing non-EU comparator countries. According to I-DESI, a number of countries – nine out of the 28 EU Member States and five out of the 17 non-EU countries – scored lower in 2018 than in previous years.

FIGURE 75:
I-DESI: INTERNATIONAL COMPARISON OF POPULATIONS WITH AT LEAST BASIC DIGITAL SKILLS 2015-2018



Note: the I-DESI indicator for basic digital skills is based on OECD indicators and computations. The TOP 4 and LOW 4 – i.e. those countries performing the best and worst respectively – vary each year. According to the contractor, data for 2018 is estimated based on the best available methods of imputing missing values.

Source: ECA based on the dataset of the I-DESI 2020 report.

EU actions to 2020

Strategic initiatives to support digital skills

The skills gap in ICT has been recognised by the EU for almost two decades.[123] In this context, the Council conclusions of 12 May 2009[124] established a strategic framework for European cooperation in education and training (ET 2020), and in 2010 the Europe 2020 strategy[125] included a digital skills element through the Digital Agenda for Europe. The Europe 2020 strategy also included "An Agenda for New Skills and Jobs", designed to modernise labour markets and empower people by developing their skills throughout the lifecycle with a view to increasing labour participation and better matching labour supply and demand, including through labour mobility.

Since 2010, the EU has put in place a number of different initiatives addressing digital skills – often as part of wider measures. The subject is a broad one, involving many stakeholders at many levels: a large part of the population, different layers of government, education and industry, for example. The result is a range of actions at EU level, running in parallel and partially inter-linked. Since 2016 there has been more of a focus on digital or basic skills, although actions continue often to address other skills, skill levels or target groups rather than specifically focusing on basic digital skills for adults.

Following a stock-taking exercise of the Europe 2020 strategy,[126] in 2015, the Commission published the Digital Single Market Strategy.[127] This strategy emphasised that the responsibility for curricula lies primarily with the Member States but that "The Commission will address digital skills and expertise as a key component of its future initiatives on skills and training". It also recognised that, despite an improvement in the share of the population that have basic digital skills, there was still a long way to go to reach the necessary level of population with such skills.

In 2016, the Digitising European Industry initiative[128] stated that digital skills were of crucial importance for achieving the digital single market, but stressed that there was also an increasing demand for other complementary skills, such as entrepreneurial, leadership and engineering skills. One of the key actions of the Digitising European Industry initiative to further develop these skills was to build on the Grand Coalition for Digital Jobs, an earlier initiative launched in 2013.

Following the Digitising European Industry initiative, the New Skills Agenda of 2016[129] recognised the need for all citizens to have at least basic skills, including digital skills, and set out specific actions to increase digital skills in Europe. Key actions of the New Skills Agenda targeting basic digital skills were the Up-Skilling Pathways initiative, and the Digital Skills and Jobs Coalition. At the same time, the Commission continued to work with stakeholders to develop tools for assessing and validating competences, in order to help public and private bodies to improve the guidance, training and mentoring services they offered.

The Upskilling Pathways initiative targets adults with a low level of skills and aims to help them to acquire a minimum level of literacy, numeracy and digital skills. This programme can be supported with EU funds, including the ESF, the European Regional Development Fund (ERDF), and Erasmus+, although no funds have specifically been allocated to basic digital skills. A February 2019 implementation report[130] found that a number of Member States had prioritised digital skills and were using ESF to support measures. However, the report also stated that the number of actions did not match the scale of the challenge as measures were addressing only a few thousand people, out of a target population of low-skilled adults of about 61 million. Moreover, despite a growing emphasis on digital skills, EU co-funded actions had tended to focus more on vocational skills and employment, rather than digital skills, although such skills may well be integrated in vocational skills training.

The Digital Skills and Jobs Coalition (Coalition) brings together Member States, companies, social partners, non-profit organisations and education providers to tackle the lack of digital skills in four areas: digital skills for all, digital skills for the labour force, digital skills for ICT professionals, and digital skills in education. As well as the objective of supporting the development of Member States' comprehensive national digital skills strategies by mid-2017, the Coalition had specific goals to be achieved by 2020, including: to train 1 million young unemployed people for vacant digital jobs, to support the upskilling and retraining of the workforce, to modernise education and training, or to reorient and make use of available funding to support digital skills.

According to the Commission, nearly all Member States had a national strategy covering digital skills by June 2019, and 25 Member States had created national coalitions by mid-2020. At the beginning of 2021, the Coalition had around 550 members, who between December 2016 and July 2018 offered nearly 11 million Europeans of all age groups (around half were primary and secondary school students) a chance to improve their digital skills.[131] There are no figures on the extent of such activities targeting basic digital skills of adults. The Commission monitors the pledges made by members of the Coalition through a dedicated tool,[132] but does not have a system for monitoring the specific objectives of the Coalition.

Monitoring of digital skills within the European Semester

The Commission also monitors the level of digital skills in EU Member States within the European Semester. Table 9 below shows that, since 2017, references and recommendations related to digital skills have generally increased. In 2020, skills were mentioned for all Member States and nine of them received recommendations related to digital skills;[133] however, none of the recommendations was specifically related to basic digital skills.

TABLE 9:
Number of Member States receiving European Semester Country Specific Recommendations

Country-Specific Recommendations	2017	2018	2019	2020
Member States where skills were mentioned	27	27	28	28
Member States receiving recommendations for skills	5	9	18	10
Member States receiving recommendations for digital skills	0	3	6	9

Source: ECA based on EU publications of the European Semester.

Erasmus+ and ESF were the main sources of funding for digital skills

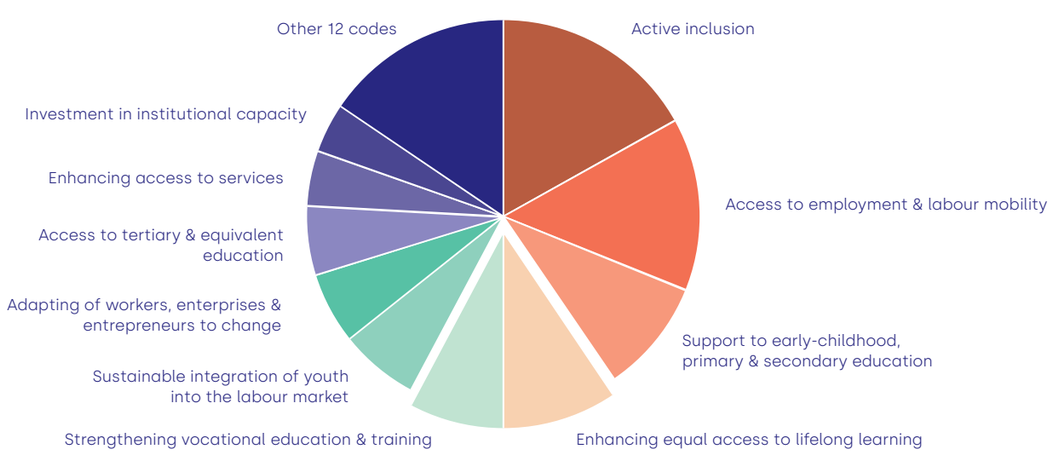
The EU did not allocate specific funding to the initiatives outlined in the previous section, which were integrated into existing funding streams. The Commission does not specify ring-fenced financing specifically for basic digital skills, in line with its objective of supporting teaching and training systems, which focus on different target groups and competences, including digital skills alongside, for example, work-related training, creativity and critical thinking. According to the Commission, the multiplicity of programme objectives means that ring-fencing specific amounts would not be flexible enough to enable programmes to adapt to local needs.

Erasmus+ supports actions in the fields of education and training, youth and sport, with a total budget of €16.45 billion for the period 2014-2020. It provides learning mobility opportunities for students, trainers and teachers, and aims to improve the quality of education and foster innovation, through cooperation and policy reform support. Our analysis showed that for all Erasmus+ supported projects, the proportion of projects addressing the acquisition of basic digital skills is less than 0.1%.

The **ESF** supports actions related to a range of objectives, including employment and better education and training. The legislation for 2014-2020 mentions digital skills[134] as an area where the ESF could contribute through its investment priorities, including those related to lifelong learning and vocational education and training. Figure 76 shows that these priorities represent the 4th and 5th largest allocations within the ESF, amounting to €14.6 billion.

From our analysis of Member State allocations, we found that out of 187 ESF programmes in 28 Member States, 29 programmes in 10 Member States planned ICT-related training in adult learning or VET (Vocational Education & Training). The total amount of planned allocation for the 28 Member States under the ESF education and training thematic objective is less than 0.6% of the whole ESF allocation for the 2014-20 period. The ESF might also contribute to the acquisition of digital skills through other thematic objectives, such as those relating to employment, social inclusion or institutional capacity building, increasing total support to around 2% of the total ESF allocation.

FIGURE 76:
ESF PLANNED ALLOCATIONS TO THE DIFFERENT INTERVENTION FIELDS



Source: ECA calculations based on the ESIF Open Data Platform.

The impact of the Commission's COVID-19 relief measures on the 2014-2020 programming (Erasmus, ESF OPs) relating to digital skills

As a response to the COVID-19 crisis, the Coronavirus Response Investment Initiative (CRII) and CRII Plus regulations allow Member States flexibility to use existing, unspent resources and re-direct them to where they are most needed. At the end of November 2020, 22 Member States (and the United Kingdom) had requested 151 amendments to their ESF programmes using the flexibilities offered by CRII and CRII Plus. In some cases, this involved transferring funds away from digital skills projects.

The proposed Recovery Assistance for Cohesion and the Territories of Europe (REACT-EU) package[135] includes €47.5 billion of additional funds that will be made available to the 2014-2020 programme period for Cohesion policy funds, which have to be spent by the end of 2023. For the ESF, actions financed by the REACT-EU could include digital skills.

Erasmus+ also published extraordinary calls to support digital education readiness, allocating €100 million for supporting projects in school education, vocational education and training, and higher education. So far, no projects could be identified supporting adult basic digital skills.

The EU proposals for the future (2021-2027)

European Skills Agenda

The European Skills Agenda[136] sets quantifiable objectives for both upskilling (improving existing skills) and reskilling (training in new skills) to be achieved within the next 5 years. It is the first proposal to include a specific target to increase the share of citizens with at least basic digital skills: from 56% in 2019 to 70% in 2025. The Agenda does not include milestones for reaching this objective.

To meet the objectives of the Agenda, the Commission estimates that €48 billion is needed annually from the public and private sector together. The Agenda mentions nine EU funds as possible sources of financing for 2021-2027. The main funds are the Recovery and Resilience Facility with a total proposed budget of €673.3 billion, the ESF+ with a proposed budget of €87.9 billion, and Erasmus with a proposed budget of €23.4 billion.

Recovery and Resilience Facility

The Recovery and Resilience Facility will make €673.3 billion in loans and grants available to support reforms and investments undertaken by Member States. It requires that Member States prepare national recovery and resilience plans that set out a coherent package of reforms and public investment projects. These plans should address challenges identified in the European Semester, particularly the country-specific recommendations adopted by the Council, which include digital skills. In this context, the Commission encourages Member States to include in their recovery and resilience plans investments and reforms focusing on digital skills and educational and vocational training for all ages with a view to reaching its 70% target by 2025.[137]

The Council's position[138] is that at least 20% (€144.8 billion) should be spent on "digital transition", which includes digital skills at all levels. In this context, the Council conclusions of 2 October 2020[139] refers specifically to the upgrading of digital skills in education systems.

European Social Fund Plus (ESF+)

The objectives of the ESF+[140] include digital skills – although not necessarily basic digital skills. It also aims to contribute to relevant aspects of other key EU initiatives and activities, in particular the "Skills Agenda for Europe" and Upskilling Pathways. Its planned budget for the period 2021-2027 amounts to €87.9 billion, but there is no specific allocation for "digital skills".

In the 2019 European Semester Country Reports,[141] the Commission presented preliminary views on priority investment areas and framework conditions for the effective delivery of the 2021-2027 Cohesion Policy. This provided the basis for a dialogue between Member States and the Commission on the programming of the cohesion policy funds (including ESF+). The Commission considered that 23 out of 27 Member States should address digital skills in their programmes.

New Erasmus programme for 2021-2027

The Commission proposed a new Erasmus programme for the period 2021-2027,[142] which covers both basic and advanced digital skills and which essentially continues the programme from the previous period. The new programme will also support VET, digital literacy, and adult education, and digital skills are mentioned specifically – although with a special emphasis on advanced digital skills.

Digital Education Action Plan

In September 2020, the Commission proposed a new Digital Education Action Plan 2021-2027.[143] The Action Plan states among its guiding principles that digital literacy is essential for life, and that basic digital skills should become part of the core transferable skills that everyone should have. In line with these guiding principles, it proposes a range of actions, such as using the Erasmus programme to support the digital transformation plans of education institutions, the development of a European Digital Skills Certificate recognised and accepted by governments, employers and other stakeholders across Europe, and proposing a Council recommendation on improving the provision of digital skills in education and training.

Council recommendation to reinforce the Youth Guarantee

The EU's Youth Guarantee is a commitment by all Member States to ensure that all young people under the age of 25 years receive a good quality offer of employment, continued education, apprenticeship or traineeship within a period of four months of becoming unemployed or leaving formal education. In November 2020, the Council reinforced its recommendation from 2013 by inter-alia raising the age group to encompass all young people under 30 years. The Council also recommended that Member States should use DigComp to assess the digital skills of all young people not in employment, education or training who register in the Youth Guarantee so that all young people who need it are offered dedicated training to enhance their digital skills.[144]

Digital skills indicator update

The Commission will introduce a revised methodology for the digital skills indicator. The indicator will be adapted by adding a fifth competence area, "Safety", to the four existing areas of the current ICT environment. With this revision, Eurostat's composite digital skills indicator will be aligned with the 2018 update of the Council Recommendation on the "key competence framework for lifelong learning" and the indicator will also better reflect the Digital Competence Framework from 2021.

CHALLENGES FOR THE FUTURE

In order to reach the objectives set for the upcoming EU programme period, we identified some key challenges:

Adequate funding for increasing digital skills is an important part of the equation. Policy objectives are more likely to be achieved if sources and amounts of funding are identified, even if only indicatively. While the European Skills Agenda mentions the different EU funds that could support implementation, it does not specify the amounts involved.

The European Skills Agenda has not defined milestones to reach the overall objective, nor, for example, a minimum level to be reached by all countries. Such specific targets and milestones would help for example in monitoring the implementation of the policy with a view to reducing the digital divide between high and low performing countries.

In terms of monitoring, the Eurostat's composite indicator is a useful tool for assessing the level of digital skills of EU citizens and will also serve to monitor progress in reaching the 70% target for people with at least basic digital skills by 2025. Updating the indicator and extending its scope to include a "safety" element from 2021 usefully aligns the indicator with the DigComp framework but will change its values. The Commission is taking measures to reduce this impact, but altering the calculation of the indicator may still affect the achievability of the 2025 target.

In terms of monitoring, it was difficult for the Commission to identify EU-funded projects designed to contribute to the upskilling of the digital skills of adults to at least the basic level during the period 2014-2020, and to assess how far they might have contributed to this objective. For the period 2021-2027, the ability to monitor such projects would help the EU judge whether actions had been successful or not.

SUMMARY AUDIT REPORT 8

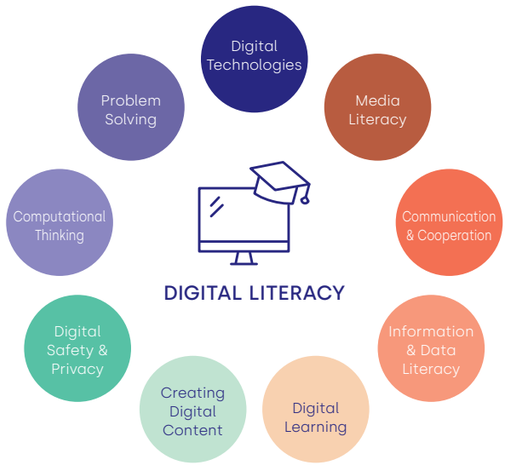
THE OFFICE OF THE STATE COMPTROLLER AND OMBUDSMAN OF ISRAEL

TEACHING DIGITAL LITERACY FOR CHILDREN AND ADULTS

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. Digital literacy spans a wide range—from the most basic digital skills (e.g., the ability to use an internet browser or download, save and upload various types of data to/from the internet), through to competency in programming, using advanced technological tools and performing complex data analysis (the overall continuum comprising digital literacy will henceforth be referred to also as digital skills). Along the continuum, additional skills are needed, as well as social understanding and an appropriate ethical approach.[145]

FIGURE 77:
DIGITAL LITERACY COMPONENTS[146]

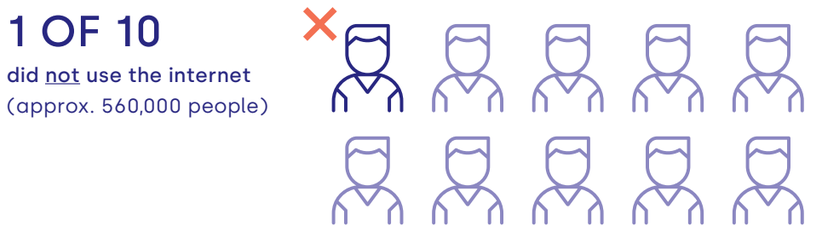


In an era of a unique and rapid technological revolution, digitally literate workers who can adapt quickly to technological changes, are expected to have a significant advantage in the labour market. Digital literacy is also necessary for participation in a range of other activities, such as exercising one's rights and using online services as well as online learning, inter alia, in order to upgrade skills and employability.

Internationally too, there is growing focus on the need for digital literacy: the UN Sustainable Development Goals (2015), endorsed by Israel, set a target of substantially increasing the number of persons who have relevant skills for employment, one of the indicators being the proportion of individuals with information and communications technology (ICT) skills.[147] The OECD also recognized the primary importance of developing digital literacy for all, alongside the enhancement of other basic skills—literacy and numeracy. The EU is similarly profoundly concerned with digital skills, and in 2016 the European Commission instructed each member State to develop national digital literacy strategies and establish national coalitions that will support their implementation.[148] In 2018 the Commission added a European action plan for digital education, based on a conceptual framework of digital skills named DigComp (Digital Competence Framework for Citizens), and set up a coalition of States, companies, social partners, non-profit organizations and education providers to tackle the lack of digital skills.[149] Accordingly, a number of countries, such as Portugal, the Czech Republic, Ireland, Italy and Norway, adopted a national digital literacy policy.[150]

The measurement of digital literacy focuses, on the one hand, on the frequency of digital use and types of use and, on the other hand, on the level of digital skills. In Israel, even though the high-tech industries are at the forefront of technological advancement, the advantages of the information age have yet to trickle down to all parts of society:

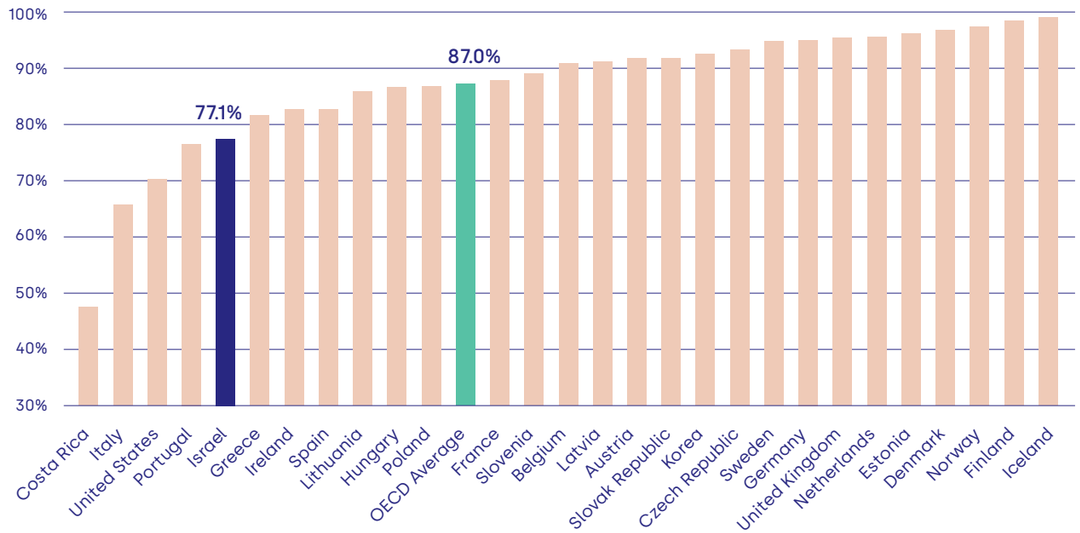
FIGURE 78:
THE USE OF THE INTERNET IN ISRAEL, AGES 20–74, 2019[151]



Source: data from the Central Bureau of Statistics (CBS)

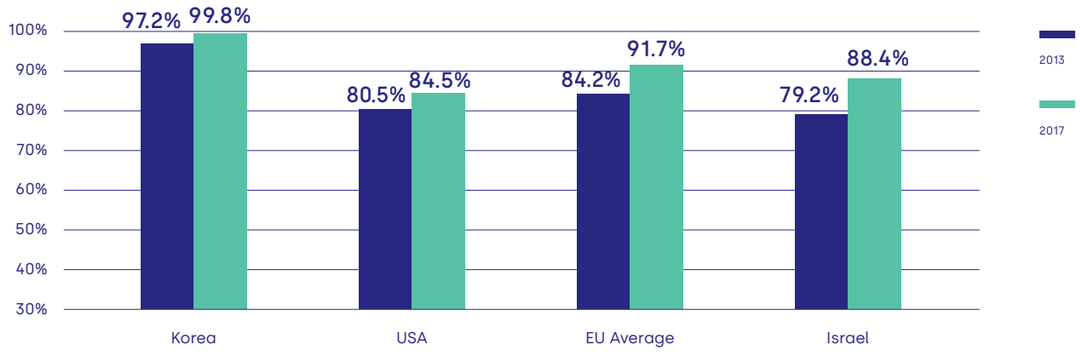
Compared internationally, the percentage of computer and internet users in Israel is low:

FIGURE 79:
PERCENTAGE OF COMPUTER USERS, OECD COUNTRIES AND OECD AVERAGE, AGES 25–54, 2017



Source: OECD data[152]

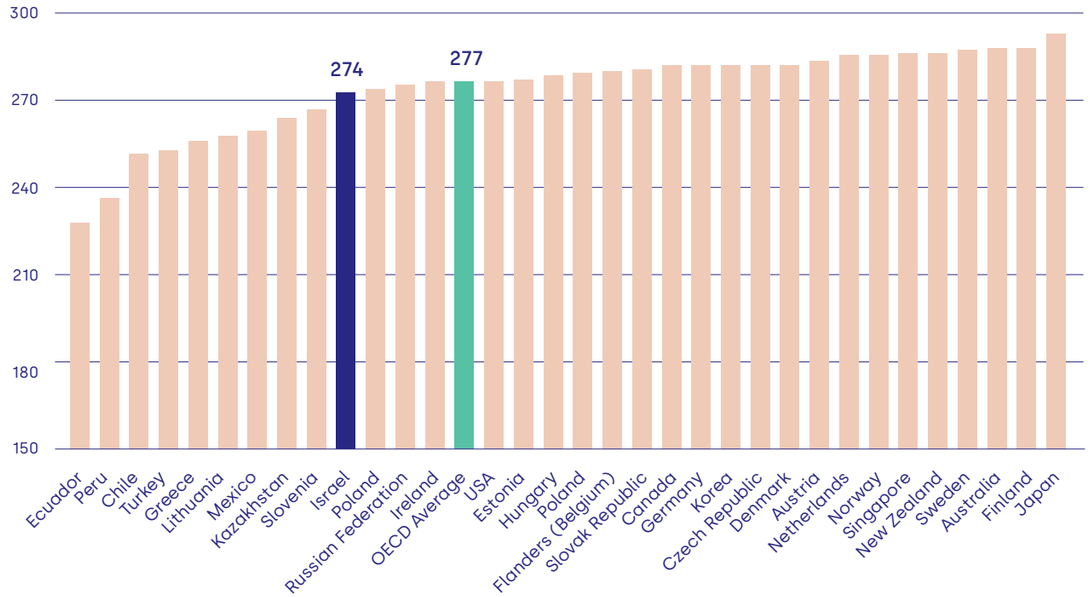
FIGURE 80:
PERCENTAGE OF INTERNET USERS, SELECTED COUNTRIES, AGES 25–54, 2013 AND 2017



Source: OECD data[153]

As shown above, internet use in Israel and other countries has gone up over the years.[154] Nevertheless, the extent of use of the internet may only be an indication of certain very basic digital skills, and does not necessarily attest to a sufficient level of digital literacy. Accordingly, Israel ranked low in the "Problem solving in technology-rich environments" test, taken as part of the PIAAC[155] skills survey:

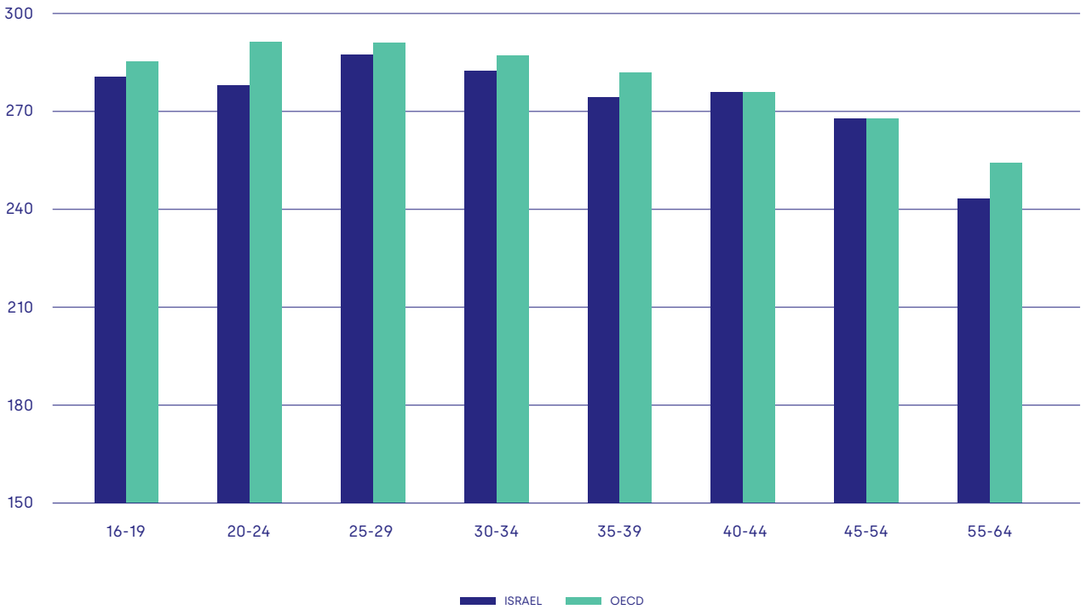
FIGURE 81:
AVERAGE SCORE ON THE PIAAC "PROBLEM SOLVING IN TECHNOLOGY-RICH ENVIRONMENTS" TEST, COUNTRIES THAT PARTICIPATED AND OECD AVERAGE, AGES 16–65, 2015



Source: PIAAC data[156]

The level of digital skills of adults in Israel, as elsewhere, goes down gradually with age (starting at approx. age 30). Accordingly, working-age people may find themselves without sufficient digital literacy for the labour market, while they still potentially have many working years ahead of them, especially with the increase in life expectancy:

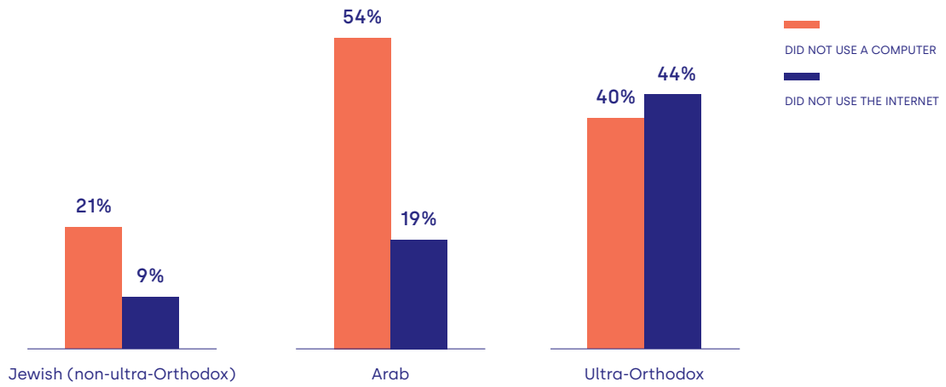
FIGURE 82:
AVERAGE SCORE ON THE PIAAC "PROBLEM SOLVING IN TECHNOLOGY-RICH ENVIRONMENTS" TEST, ISRAEL AND OECD AVERAGE, BY AGE GROUP, 2015



Source: OECD data[157]

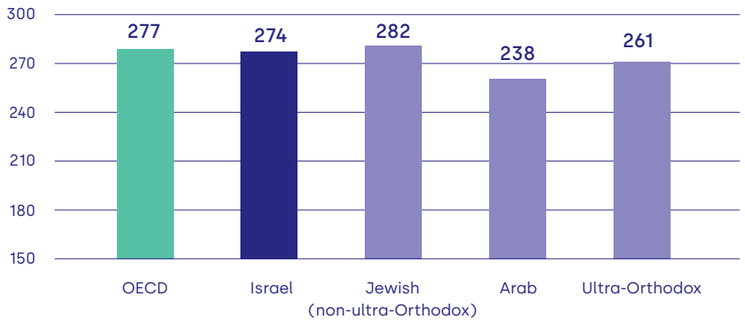
In 2015, Israel had the widest digital gap among participating OECD countries in the PIAAC "Problem-solving in technology-rich environments" test.[158] The digital gap is prevalent among the Arab-Israeli and the ultra-Orthodox[159] populations:

FIGURE 83:
PERCENTAGE OF ADULTS (AGE 20 AND UP) WHO DID NOT USE A COMPUTER OR ACCESS THE INTERNET, BY POPULATION GROUP, 2019



Source: CBS data[160]

FIGURE 84:
AVERAGE SCORE ON THE PIAAC "PROBLEM SOLVING IN TECHNOLOGY-RICH ENVIRONMENTS" TEST, OECD AVERAGE AND ISRAEL - BY POPULATION GROUP, AGES 16–65, 2015



Source: PIAAC, CBS and Ministry of Economy and Industry data

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 labour market. Such preparation 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 need is especially pressing for employees in jobs that will likely be automated in the near future. Improving their digital literacy may enable these workers, many of whom are low-skilled and earn low wages, to remain in the workforce.

KEY FIGURES

24TH

Israel's ranking - out of 33 participating countries[161] - 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 (2015)[162] - 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 and ultra-Orthodox adult populations (ages 16–65), respectively, with high levels of digital literacy,[163] vs. 37% in the Jewish non-ultra-Orthodox population and about 30% on average in participating OECD countries

36%

Of schools in the Israeli education system participated in 2018 in a program 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 DETAILS

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 Labour Branch of the Ministry of Labour, Social Affairs and Social Services (hereafter - the Ministry of Labour); the Ministry of Science and Technology; and the Israeli Employment Service.

KEY FINDINGS

Teaching Digital Literacy in the Education System

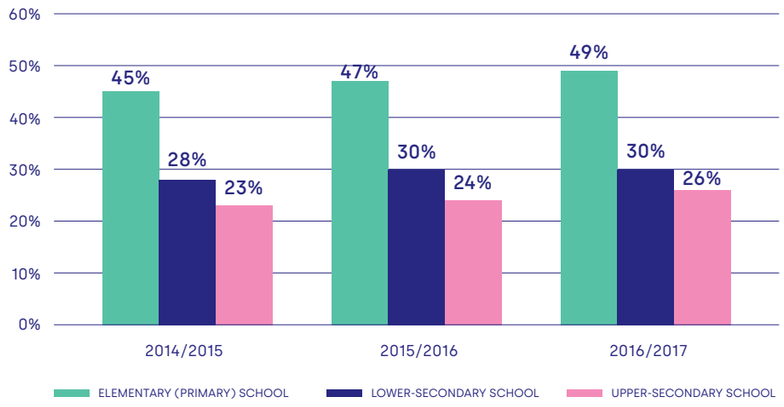
👎 National tests to measure the level of digital skills among students:

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 to 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.

FIGURE 85:
"PROMOTING INTERNET LITERACY" INDEX, ACCORDING TO THE WEIGHTED STUDENT RESPONSES TO STATEMENTS ON THIS SUBJECT, ACADEMIC YEARS 2014-2017



Source: data from the National Authority for Assessment and Evaluation in Education (hereafter – RAMA)

The digital gap in the Jewish ultra-Orthodox and Arab sectors:

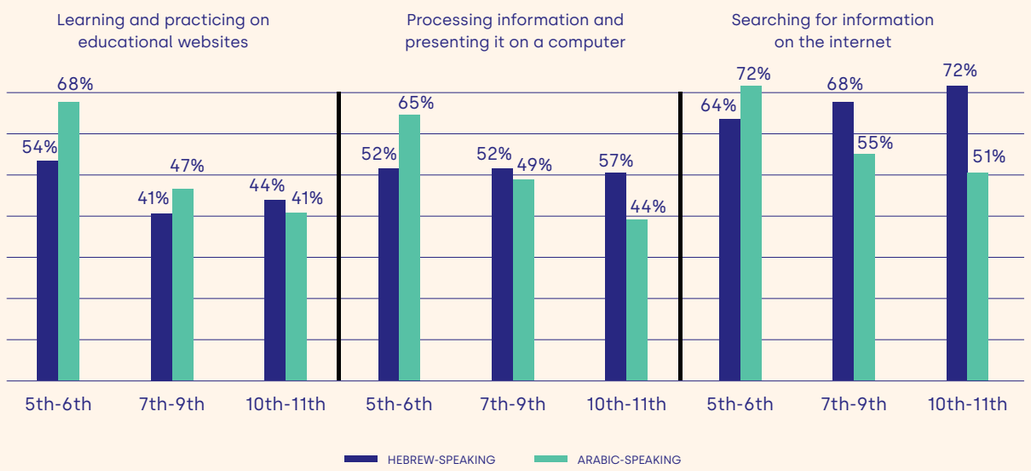
A significant percentage of Israeli students, particularly in the Jewish ultra-Orthodox and Arab sectors, do not acquire, as part of their studies, the digital skills essential for integrating successfully in the changing labour market. For example, the percentage of Arabic speakers who use computers 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:

One crucial condition for enabling the education system to meet the challenges of the 21st century, including those of the changing labour market, is the ability of teaching staffs to adapt to the ongoing developments and adjust to the changes in teaching and learning methods. The challenge is especially significant regarding the use of computer and internet applications.

It was found that 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[164] survey reported that they had the sense of capability to assist students in learning using digital technology, versus the OECD average of 67%.

FIGURE 86:
PERCENTAGE OF STUDENTS WHO AGREED WITH STATEMENTS REGARDING THEIR USE OF COMPUTERS FOR LEARNING PURPOSES, BY LANGUAGE SECTOR AND GRADE, 2017/2018



Source: RAMA, **School effectiveness and growth** (December 2019)

Monitoring and control of the use of digital educational content by students and teachers:

In order to examine and assess the effectiveness of the use of digital content, and to identify barriers and address them, monitoring and controlling is necessary, including: analyzing the number of times the content is accessed, the amount of time spent at a particular site, the activities or assignments users performed, and the degree of success at performing them.

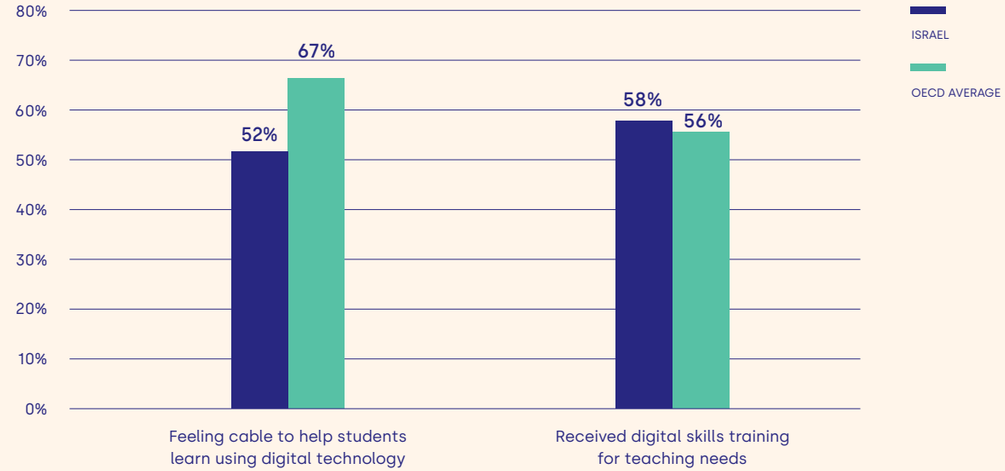
However, the Ministry of Education does not monitor and control the use students and teachers make of digital educational content in a way that will allow it to examine the effectiveness of this use.

Computational thinking:[165]

In many countries, programs to develop computational thinking are being offered. These programs provide a basic foundation in preparation for the future labour market, develop problem solving capabilities for global or national issues, teach logic and digital literacy, promote the capacity to create technology, assist individuals in integrating efficiently in modern society, nurture creativity, teach programming, nurture cooperative skills, and develop motivation and interest in learning STEM subjects (science, technology, engineering and mathematics).

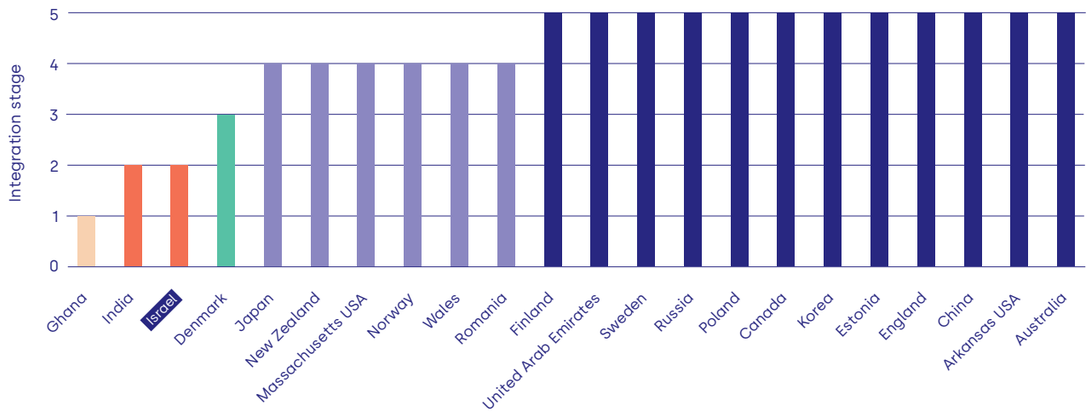
The actions of the Ministry of Education did not lead to teaching computational thinking among significant parts of the education system (e.g., it did not appear in

FIGURE 87:
PERCENTAGE OF TEACHERS WHO REPORTED FEELING CAPABLE TO HELP STUDENTS LEARN USING DIGITAL TECHNOLOGY AND THAT THEY RECEIVED DIGITAL SKILLS TRAINING FOR TEACHING NEEDS IN A TEACHER TRAINING PROGRAM OR FORMAL EDUCATION, 2018



Source: data from RAMA for the TALIS study, 2018

FIGURE 88:
INTERNATIONAL COMPARISON OF THE STAGE OF INTEGRATION OF COMPUTATIONAL THINKING INTO CURRICULA, 2019



Source: Ministry of Education data

91% of content items in the 12 study subjects that were examined in the mapping conducted by the Ministry of Education according to OECD instructions). Israel is still in the initial stage of integrating computational thinking into the curricula.

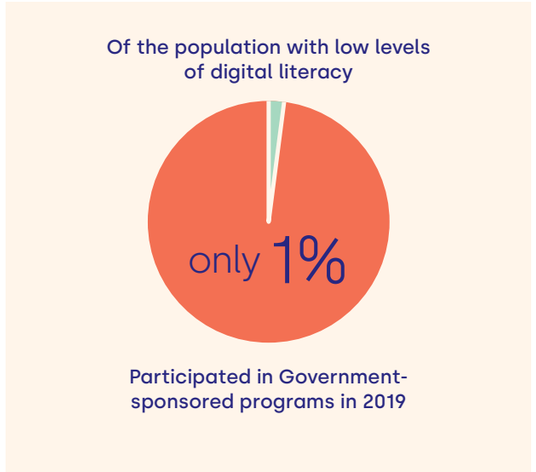
Teaching Digital Literacy to Working-Age Adults

The scope of Government activity to teach digital literacy to adults:

In 2019, Digital Israel Initiative and the Employment Service offered online courses (self-paced, non-guided) to improve digital literacy to about 140,000 adults. However, these courses may not be useful for many of the approx. 3.7 million working-age people with low levels of digital literacy, who, in many cases, do not have the basic tools and competencies needed for successful independent online learning, and they will require in-person guidance and instruction.

It was found, that only 1% of about 3.7 million working-age adults (18–64) with low levels of digital literacy participated in 2019 in a government-sponsored program (with guidance) for developing digital literacy.

Despite a Government decision of June 2017[166] 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.

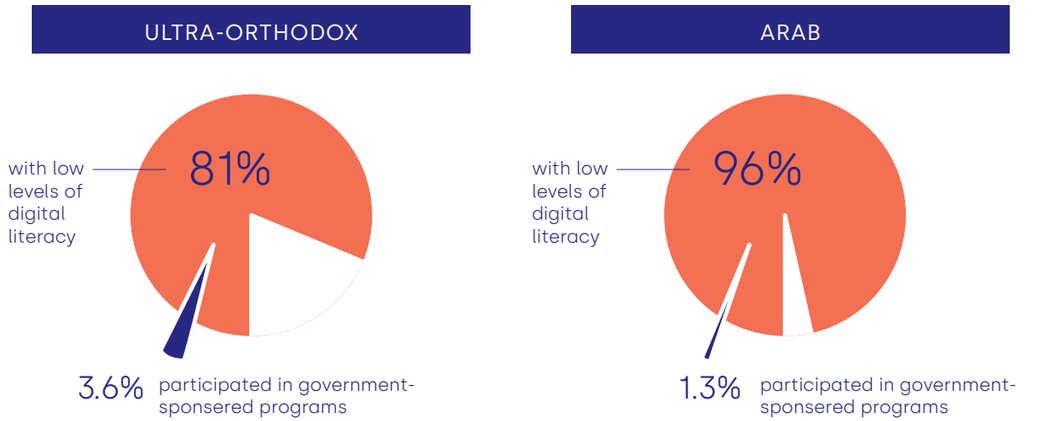


Imparting digital literacy to adults from the Arab and ultra-Orthodox populations:

The digital literacy gaps in the Arab and ultra-Orthodox populations are especially large—they use computers and the internet far less, many of them lack even the most basic digital skills, or have low levels of digital literacy. This state of affairs demands the Government to focus on these populations, both in order to enable them to integrate in stable and gainful employment (and enjoy other services in the digital world) and to reduce social gaps and improve labour productivity.

However, analysis showed that in practice these populations received little attention: 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.

FIGURE 89:
THE PERCENTAGE OF ARAB AND ULTRA-ORTHODOX PARTICIPANTS IN GOVERNMENT-SPONSORED DIGITAL LITERACY COURSES, 2019



Source: According to CBS data and the entities presented above; processed by the Office of the State Comptroller

Providing digital skills to teachers:

Israel ranks 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 Labour 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.

KEY RECOMMENDATIONS

Teaching Digital Literacy in the Education System

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.

Teaching Digital Literacy to Working-Age Adults

The scope of Government activity to teach digital literacy to adults:

It is recommended that the Digital Israel Initiative, the Ministry of Labour, 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 labour productivity.

Imparting digital literacy to adults from the Arab and ultra-Orthodox populations:

It is recommended that the Digital Israel Initiative, the Ministry of Labour 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 labour 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.

CONCLUSIONS

In an era of a unique and fast-paced technological revolution, being tech-savvy, data and internet literate, and proficient in problem solving in technology-rich environments - become necessary for successful and stable employment in the changing labour market. In order to improve the chances of all parts of society to be productive participants in the changing workforce, to reduce poverty and social gaps, it is imperative to teach digital literacy to all parts of the population, including the Arab and ultra-Orthodox populations, from an early age and throughout life.

Promoting digital literacy should therefore 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 teachers 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 labour market in lasting, quality employment. Investing in digital literacy for workers, and for workers-to-be, is likely to contribute to economic growth, improved labour productivity, and employment stability.

SUMMARY AUDIT REPORT 9

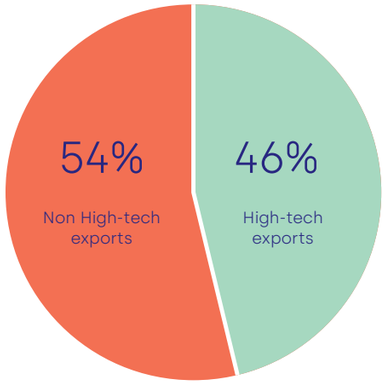
THE OFFICE OF THE STATE COMPTROLLER AND OMBUDSMAN OF ISRAEL

STATE ACTIONS TO INCREASE THE NUMBER OF EMPLOYEES IN THE HITECH INDUSTRY

BACKGROUND

Israel's advanced HiTech industry has earned it the status of "Start-Up Nation". This industry is a principal growth engine of the Israeli economy, contributing 12% to the State's gross domestic product (GDP).

FIGURE 90:
HITECH EXPORTS AS A PERCENTAGE OF THE TOTAL SUM OF ISRAELI EXPORTS



Source: Based on data from the Israel Export Institute

Israel's HiTech industry also stands out in international comparison. For example, in advanced technology sectors (computer and information services, R&D and computers and electronics), Israel's labour productivity is higher than the OECD average . The HiTech industry also contributes significantly to the State's tax revenue. Between 2015 and 2018, the State's tax revenue from the HiTech industry amounted to 55 billion NIS. Export of HiTech services continues to grow at an accelerated rate, being the essential factor in the growth of Israel's exports. Exports from Israel in 2019 amounted to 113 billion $US, of which the HiTech export (products and services) was approximately 52 billion $US - 46%.

Various international entities predict far-reaching changes in the labour market as a consequence of the rapid technological revolution the world is witnessing. The present trends are expected to create a demand of 20–50 million new positions worldwide in various technological professions, including - computer science and engineering. A chronic shortage of skilled employees in Israel's HiTech industry is a strategic threat to this sector, in particular, and to the Israeli economy, in general.

According to the 2019 HiTech Human Capital Report, the number of employees in the HiTech industry in 2019 was approximately 321,000, 9.2% of all employees in the

Israeli workforce:[167] in July 2019, there were an estimated 18,500 vacancies in the HiTech industry. The shortage is primarily of excelling university graduates from the fields of computer hardware and software engineering with professional experience.

In January 2017, the Israeli Government adopted a resolution to formulate the "National Program to Increase the Skilled Workforce for the HiTech Industry", which intended to advance solutions for the shortage of skilled personnel in the HiTech industry. The Government resolution details the objectives to be achieved and the steps required in higher education, in non-academic training, and in the Ministry of Defense, including in the Israel Defense Forces (IDF), in integrating underrepresented populations and more, as detailed below:

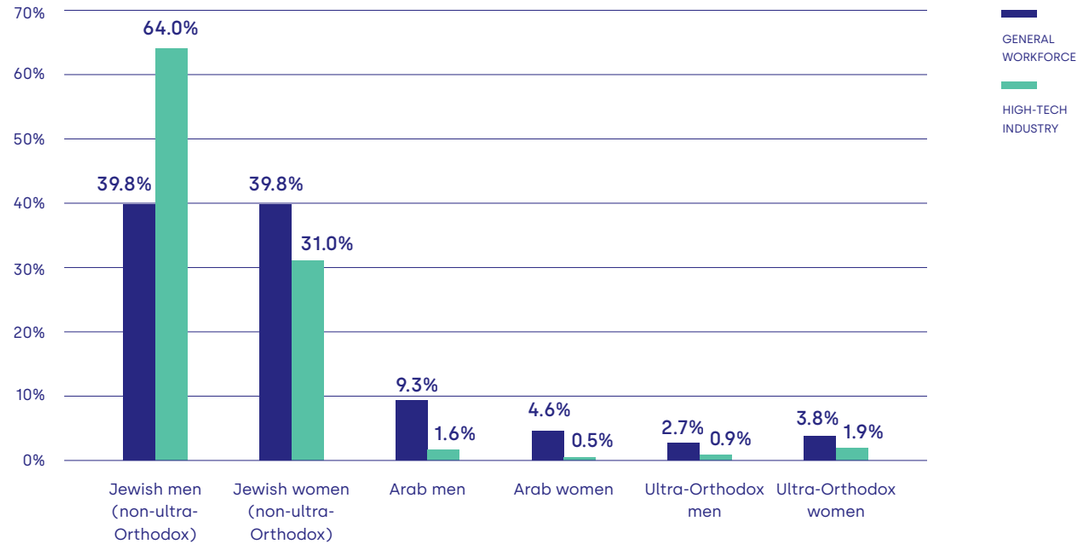
Short-term steps: Focusing on realizing the unfulfilled occupational potential, primarily through non-academic training for people with academic degrees who have the potential to integrate into the HiTech industry.[168]

Mid-term steps: Focusing on increasing the number of people with academic degrees in HiTech subjects, with the emphasis on university graduates and leveraging IDF military service.

The long-term steps were intended to address the root of the problem, focusing on the actions required of the education system in order to increase the number of secondary school students graduating with a high-quality matriculation certificate in the fields of mathematics, science and technology.

The Government resolution regarding the HiTech industry also deals with advancing the integration of underrepresented populations into the HiTech industry, given that most HiTech employees are Jewish non-ultra-Orthodox men. The industry has an insufficient representation of women, Jewish ultra-Orthodox[169] and Arabs.

FIGURE 91:
PERCENTAGE OF EMPLOYEES IN THE GENERAL WORKFORCE AND IN THE HITECH INDUSTRY, BY POPULATION GROUP, 2019



Source: Based on data from the HiTech Human Capital Report and from the head of the Labour Branch

KEY FIGURES

9.2%

The share of employees in the HiTech industry in Israel in 2019, out of the Israeli workforce (approx. 321,000 employees)

18,500

Estimated number of technological vacancies in the Israeli HiTech industry in July 2019

900M NIS

The budget of the "National program to increase the skilled workforce for the HiTech industry"

17%

Of the students taking the five-unit (highest level) mathematics matriculation exam do not have a computer science program offered in their school

40%

The increase in the number of undergraduate university students majoring in academic HiTech subjects, in line with the target set in the Government resolution

22%

Of students who began their university undergraduate studies majoring in computer science, did not complete a degree within 6 years. Another 20% switched majors during their undergraduate studies

4.9%

The percentage of Jewish ultra-Orthodox and Arab employees (women and men) in the HiTech industry in 2019, compared to 20% in the general workforce

31%

The percentage of Jewish non-ultra-Orthodox women working in the HiTech sector in 2019, compared to 40% in the general workforce

AUDIT DETAILS

From January 2019 to March 2020, the Office of the State Comptroller examined the actions taken by the Government to increase the number of employees in the HiTech industry, in accordance with Government resolutions and in view of the need to prepare the industry for future demand for employees. The audit examined the actions of the education system; the actions of the Council for Higher Education (CHE) to increase the number of students majoring in HiTech subjects; actions to integrate underrepresented populations in the HiTech sector; and IDF actions to leverage military service for the benefit of the HiTech industry. The audit was conducted in the Labour Branch of the Ministry of Labour, Social Affairs and Social Services (Ministry of Labour), the Ministry of Education, the National Economic Council, the IDF and the Ministry of Defense, the Ministry of Finance, the CHE and the Israel Innovation Authority. Supplementary audits were conducted in some universities and colleges.

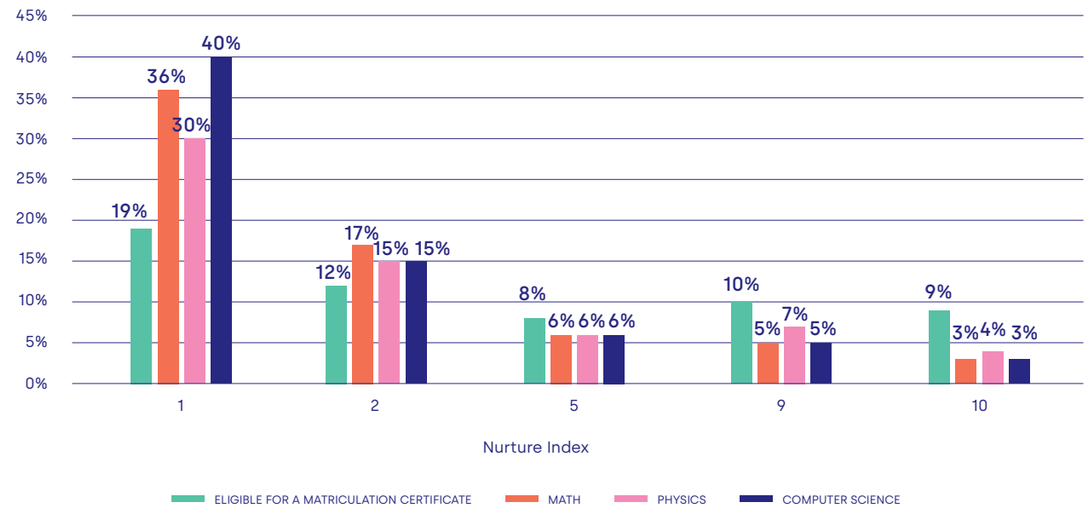
KEY FINDINGS

The education system as the foundation for increasing the number of HiTech employees:

About 75% of the employees in the HiTech industry hold an academic degree. Studies show a strong link between learning scientific-technological subjects in upper secondary schools (e.g., mathematics, physics, computer science and system design and programming) and academic studies of HiTech subjects.[170] The probability that a student who studied computer science in secondary school will study a HiTech subject for an academic degree is higher than the probability of a student who studied other subjects—for example, it is four times higher than if a student took biology in secondary school. The probability is also higher for students who studied physics or an engineering–technology program in secondary school. Further, studying computer science in secondary school paves the way to a military service in one of the IDF's technological units[171] (see the section on leveraging IDF military service).

Furthermore, the majority of students taking the five-unit matriculation exams in scientific–technological subjects— areas especially relevant for a career in HiTech —studied in schools which are 'strong' in socioeconomic terms. For example, more than half of the students taking the five-unit mathematics and computer science exams (53% and 55%, respectively) studied in the strongest schools, whereas, only 8% of them (in each subject) studied in the weakest schools.

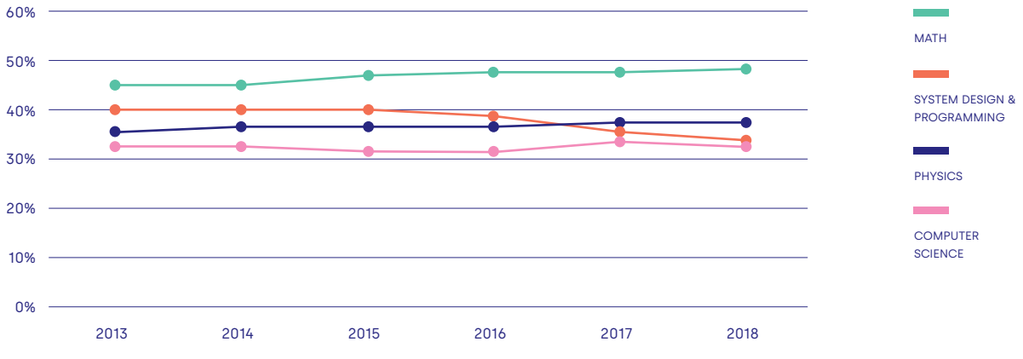
FIGURE 92:
THE DISTRIBUTION OF THE SHARE OF STUDENTS TAKING FIVE-UNIT EXAMS IN MATHEMATICS, PHYSICS AND COMPUTER SCIENCE (OUT OF ALL THE STUDENTS TAKING THOSE EXAMS), AND OF THE SHARE ELIGIBLE FOR A MATRICULATION CERTIFICATE, BY THEIR SCHOOL'S PERFORMANCE ON THE NURTURE INDEX (1 – THE STRONGEST POPULATION IN SOCIOECONOMIC TERMS; 10 – THE WEAKEST POPULATION IN SOCIOECONOMIC TERMS),[172] 2018



Source: Based on data from the Ministry of Education

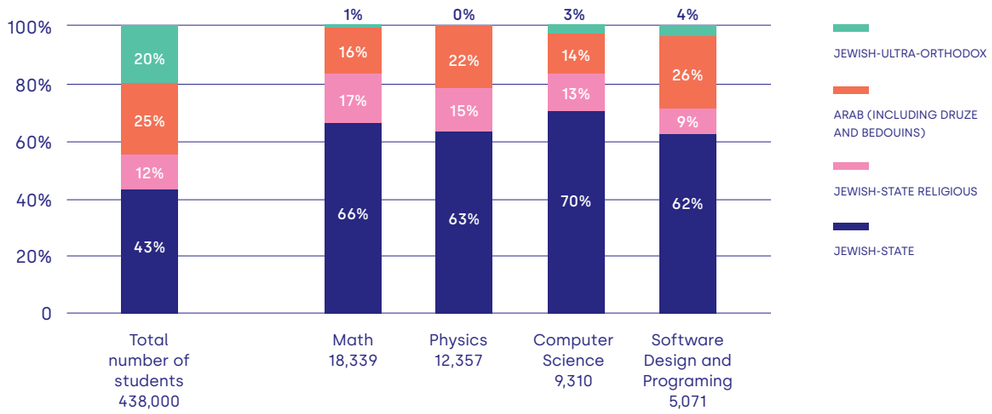
Moreover, the education system is not fulfilling the potential of students to study scientific–technological subjects—especially among girls, and students from the Arab and the Jewish ultra-Orthodox populations.

FIGURE 93:
THE SHARE OF GIRLS AMONG ALL STUDENTS WHO TOOK THE FIVE-UNIT MATHEMATICS, BIOLOGY, CHEMISTRY, PHYSICS, COMPUTER SCIENCE OR SYSTEM DESIGN AND PROGRAMMING EXAMS, 2013–2018



Source: Based on data from the Ministry of Education

FIGURE 94:
DISTRIBUTION OF STUDENTS WHO TOOK THE EXAMS IN MATHEMATICS, PHYSICS, COMPUTER SCIENCE AND SYSTEM DESIGN AND PROGRAMING, BY SECTOR, AND THE DISTRIBUTION OF ALL SECONDARY SCHOOL STUDENTS, BY SECTOR,[173] ACADEMIC YEAR 2017/2018

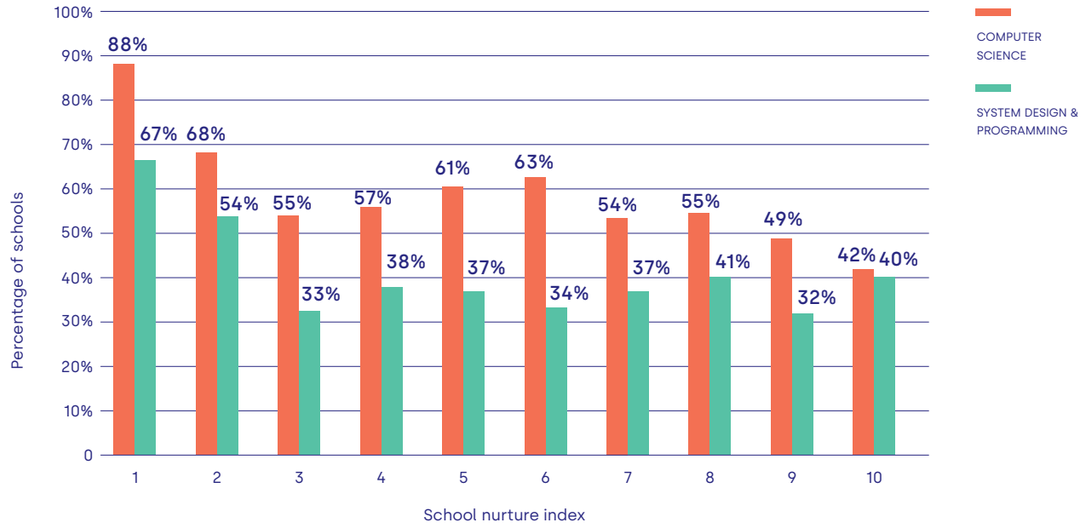


Source: Based on data from the Ministry of Education

Schools teaching mathematics and computer science

Only about 40% of the weakest schools (those lowest on the Ministry of Education's school nurture index) which offer their students the opportunity to study mathematics at the five-unit level, offer also five-unit computer science or system design and programming . In contrast, among the "strong" schools (in socioeconomic terms), the percentage of schools offering both these subjects at the five-unit level is the highest. For example, 88% of the strongest schools that teach mathematics at the five-unit level also teach computer science at the five-unit level. This situation paves the way to academic studies in HiTech subjects mostly for students from "strong" schools. In general, approximately 3,000 students taking five-unit mathematics in school in 2018, have no opportunity to study computer science in school, mainly due to a shortage of teachers.

FIGURE 95:
PERCENTAGE OF SCHOOLS OFFERING FIVE-UNIT COMPUTER SCIENCE OR SYSTEM DESIGN AND PROGRAMMING OUT OF SCHOOLS THAT OFFER FIVE-UNIT MATHEMATICS, BY SCHOOL NURTURE INDEX, 2018

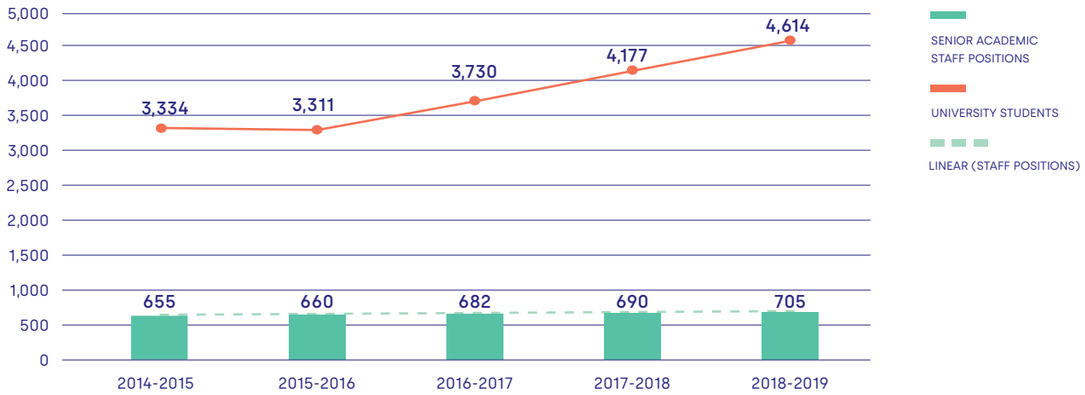


Source: Based on data from the Ministry of Education

Increasing the number of university graduates in HiTech subjects:

The main barriers hindering an increase in the number of university graduates in HiTech subjects are a shortage of academic staff and high dropout rates of students from these subjects. Nonetheless, the Planning and Budgeting Committee (PBC) in the CHE[174] has not set goals for increasing the number of academic staff and reducing the dropout rates. Moreover, the PBC has not requested the universities to examine the reasons for student dropout.

FIGURE 96:
THE INCREASE IN THE NUMBER OF SENIOR ACADEMIC STAFF POSITIONS IN HITECH FIELDS IN UNIVERSITIES RELATIVE TO THE INCREASE IN THE NUMBER OF STUDENTS, ACADEMIC YEARS 2014–2019



Source: Based on data from PBC

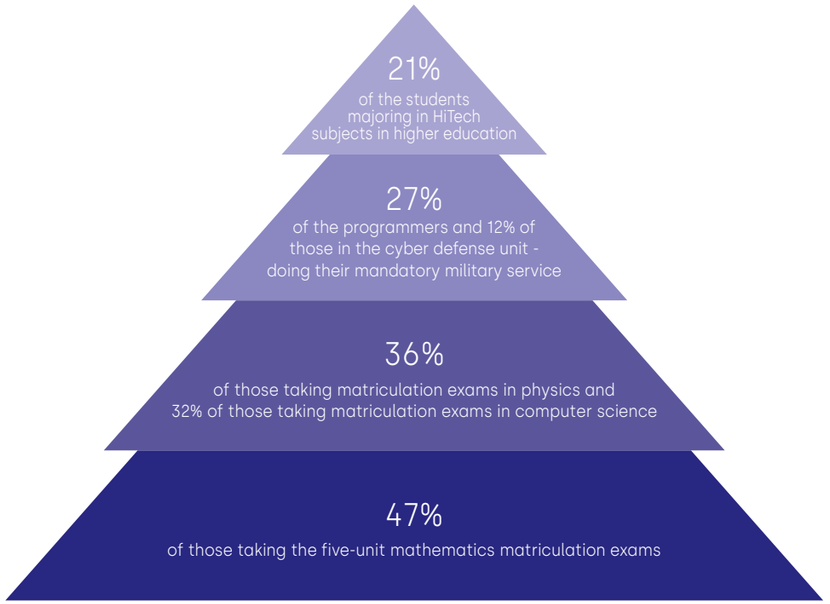
Leveraging military service to increase the number of trained personnel for the HiTech industry:

The Defense Establishment and the IDF are a significant factor in the development of the HiTech industry in Israel. Given that the IDF is at the crossroads between graduating from the education system (secondary school) and choosing a career, military service has a significant role in the efforts to increase the number of HiTech personnel. The Government's resolution assigned the Director General of the Ministry of Defense, in cooperation with additional entities,[175] to formulate a program to leverage military service for the purpose of increasing skilled personnel for the HiTech industry. However, The Ministry of Defense has not formulated an operative program for leveraging the military service in the IDF to increase the number of trained personnel for the HiTech industry, as required by the Government resolution in this matter.

Integrating women into the HiTech industry:

According to the data of the Ministry of Education, girls are almost half (47%) of the students who take the five-unit mathematics matriculation exams, and only one-third of the students who major in physics and computer science . The gender gaps intensify during military service. Despite similar percentages of men and women expressing a desire to serve in the IDF's technological units, the percentage of women serving in these units is low. These gaps continue in the higher education system, and consequently, there is a low share of women working in core positions in the HiTech industry. In 2019, the share of women in the HiTech industry working in technological positions was about 22%, and in technological management positions—18%. Various public entities operate Government programs to increase the percentage of women studying scientific–technological subjects and integrate them into the HiTech industry. But the Government programs for the integration of women into the HiTech industry lacks comprehensive planning.

FIGURE 97:
THE DROP IN THE PERCENTAGE OF WOMEN IN THE SCIENTIFIC-TECHNOLOGICAL SUBJECTS AND POSITIONS IN DIFFERENT LIFE STAGES



Source: Nili Ben Tovim and Noam Kost, **Female Students Taking HiTech Courses**. The National Economic Council (2017).

Integrating the Jewish ultra-Orthodox into the HiTech industry:

In 2018, the Jewish ultra-Orthodox population in Israel was 1,079,000, approximately 12% of the total population. According to the Central Bureau of Statistics, the ultra-Orthodox share in the population is expected to increase to 20% by 2040 and to 32% by 2065. In 2017, the employment rate of ultra-Orthodox men was lower than 50%, while almost 75% of ultra-Orthodox women (between the ages of 25–64) were employed. The average income of ultra-Orthodox employees (men and women) in 2016 was 67% of the average income in Israel, mainly because they were employed in " low wage" sectors and not in the HiTech industry. It is noteworthy that in recent years, a very slow change has begun in the ultra-Orthodox world, which is creating opportunities for this population to integrate into the HiTech industry.

However, the head of the Labour Branch has not formulated a systematic program for increasing the number of employees from the ultra-Orthodox population in the HiTech industry. The majority of Government activity in this regard does not focus on the core professions in the industry, but rather trains for junior technological positions. No suitable program has been developed for the approx. 1,900 ultra-Orthodox women studying practical software engineering in designated seminaries, even though some of them clearly have the potential to study HiTech subjects at a higher level and later work as software developers in the HiTech industry.

Non-academic training:

There is no mechanism in place to coordinate the operation of the two main Governmental entities responsible for non-academic training for the HiTech industry—the Israel Innovation Authority and the Labour Branch.[176] The two operate without defining the scope of responsibility and authority of each of them. For example, it was essential that they define, for each program, the characteristics of participants and their required skills, that they formulate the way to match the most suitable program to each candidate, that they avoid duplication of similar programs and ensure that they are addressing the required market needs, and create a joint placement mechanism.

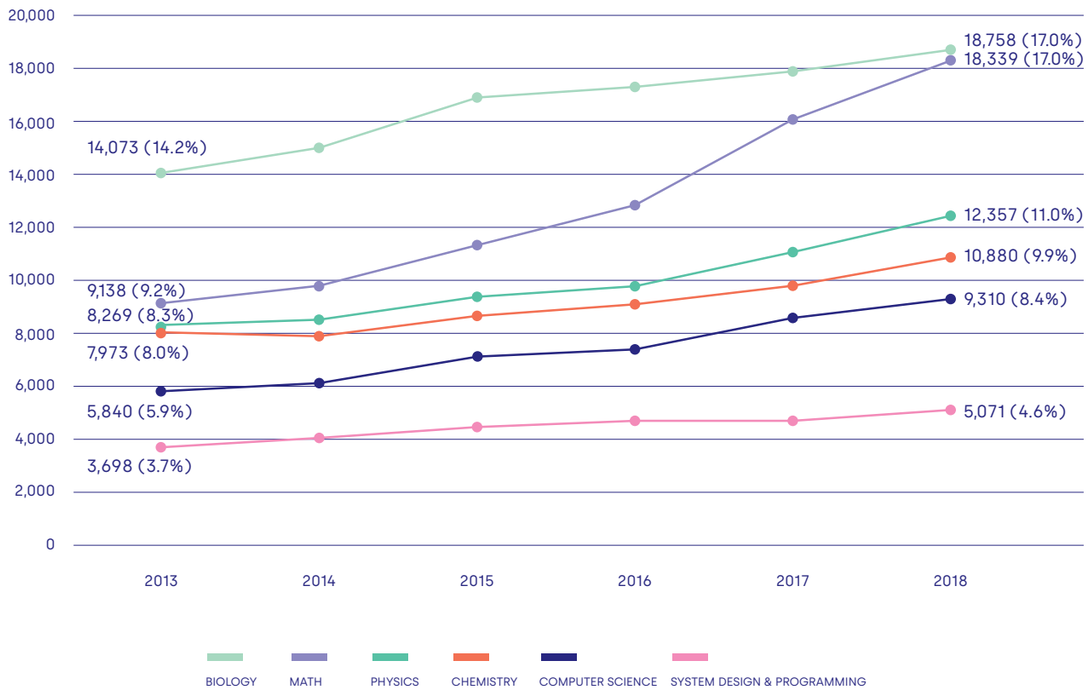
Monitoring the implementation of the Government resolution regarding the HiTech industry:

The ministerial committee for skilled personnel in the HiTech industry, established according to the Government resolution in this matter, has not convened. The professional team responsible for this matter has met twice. Consequently, the responsible entities did not advance other tasks included in the Government's resolution, such as the program for leveraging military service. Furthermore, the program for integrating underrepresented populations in HiTech requires a comprehensive response, which will enable a greater participation of these populations.

The Initiative of the Ministry of Education to increase the number of students taking the five-unit exams in technological and scientific subjects ("Double the 5's"):

The initiative succeeded in doubling the number of students matriculating in five-unit mathematics—from 9,000 in 2013 to 18,000 in 2018. An increase was noted also in the number of students taking the five-unit exams in technological and scientific subjects such as physics, chemistry, biology, computer science and system design and programming.

FIGURE 98:
THE NUMBER OF STUDENTS WHO TOOK THE MATHEMATICS, SCIENCE, AND TECHNOLOGY FIVE-UNIT EXAMS AND THEIR PERCENTAGE AMONG ALL STUDENTS ELIGIBLE FOR A MATRICULATION CERTIFICATE, 2013–2018

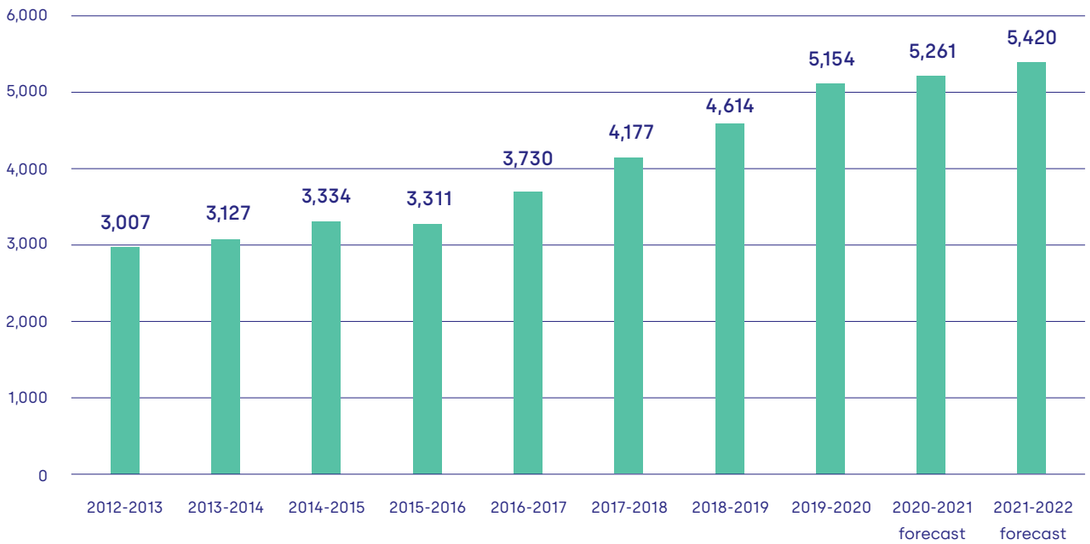


Source: Based on data from the Ministry of Education

The number of undergraduate students majoring in HiTech subjects:

The higher education system has met the target established by the Government, and as early as the academic year 2018/2019, the number of university students majoring in HiTech subjects, increased by 40%, compared to academic year 2015/2016.

FIGURE 99:
NUMBER OF STUDENTS WHO STARTED UNIVERSITY STUDIES IN HITECH SUBJECTS IN BETWEEN 2012–2020 AND THE FORECAST FOR 2020–2022



Source: Based on PBC data from December 2019 and October 2020

KEY RECOMMENDATIONS

The education system as the foundation for increasing the number of HiTech employees:

It is recommended that the Ministry of Education formulate a program for removing those barriers hindering the increase in the number of students studying scientific–technological subjects in upper secondary schools; and act to fulfill the potential of each student, specifically those taking the five-unit mathematics exams. It is recommended that a special emphasis be placed on increasing the number of girls studying scientific–technological subjects as well as students from the Jewish ultra-Orthodox and Arab populations.

Addressing the shortage of teachers for computer science:

It is recommended that the Ministry of Education examine additional ways to increase the number of teachers for computer science, including training programs and programs for encouraging teachers to teach computer science in communities belonging to low socioeconomic clusters; consider adding computer science as one of the subjects in the "Virtual High Schools";[177] consider establishing centers for computer science studies accessible to students from geographic areas characterized by small settlements; and try to integrate in the school teaching staff suitable instructors from programs operating outside of the schools. These actions may improve the foundations for the future generation to study computer science, with an emphasis on schools with students from weaker populations.

Increasing the number of university graduates in HiTech subjects:

It is recommended that the CHE and PBC in cooperation with the Ministry of Finance and the heads of academic institutions prepare a systematic program to advance a long-term solution—which will enable optimal handling of the shortage of academic staff in HiTech subjects and will include objectives to increase the number of staff. It is also recommended that they systematically analyze the dropout reasons and the characteristics of students who drop out, establish yearly goals for reducing the numbers of dropouts, and provide tools and solutions for achieving these goals.

Leveraging military service to increase the number of trained personnel for the HiTech industry:

It is recommended that the Ministry of Defense, in cooperation with relevant entities, formulate a program for this objective, which will define the entities responsible for every task, will examine ways to remove the barriers to its implementation, will present a timeline for implementation and will detail its budget requirements as well as the funding sources.

Integrating women into the HiTech industry:

It is recommended to advance a comprehensive program that will propose a range of solutions for removing the barriers to integration of women in the HiTech industry, according to their life stages and professional development. The program should start with solutions for the education system, through to the military service, academia, and finally - employment in the HiTech industry.

Integrating the Jewish ultra-Orthodox into the HiTech industry:

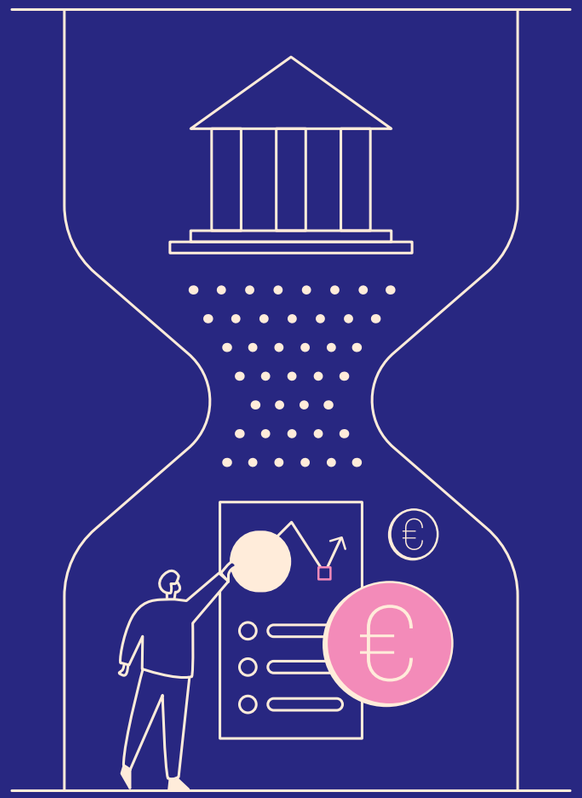
It is recommended that the head of the Labour Branch initiate additional channels, aside from academic HiTech education, to integrate the ultra-Orthodox into the HiTech industry. For example, retraining ultra-Orthodox university graduates from other study fields, could be considered. It is suggested that the formulation of plans will be done in consultation with relevant representatives from the ultra-Orthodox communities, as well as other relevant entities including the Ministry of Education, the IDF and the National Civil Service, the CHE, the Israel Innovation Authority and stakeholders from the HiTech industry. It is further recommended that the Government Institute for Technology and Science Training and the Ministry of Education examine ways to fulfill the potential of ultra-Orthodox women students, including ways to broaden and upgrade the curricula in relevant HiTech subjects.

Non-academic training:

It is recommended that Israel Innovation Authority and the head of the Labour Branch establish a mechanism for coordination between them and define their respective areas of responsibility in order to efficiently utilize the resources available and achieve maximum outputs. Regarding non-academic training for women, in view of the broad potential in the integration of women into the HiTech industry, it is worth considering appointing a single entity to be responsible for this task. It is also recommended to consider the establishment of a guidance mechanisms that will direct candidates according to their personal characteristics to the most suitable program for them, and design and operate one joint placement center for all the graduates based on their training. It is further recommended to consider establishing a joint internet website, containing comprehensive information regarding all the non-academic training options for various populations.

CONCLUSIONS

In order to ensure the continued status of Israel as a "Start-Up Nation", the relevant government entities (CHE, Ministry of Finance, Ministry of Education, Ministry of Labour, Welfare and Social Services, Israel Innovation Authority, Ministry of Defense) should undertake to remove the barriers hindering this objective: address the existing shortage of skilled personnel in the HiTech industry and ensure a long-term solution for suitable personnel; a special and crucial emphasis must be placed on involving the Ministry of Education fully in this task. An additional source for broadening the potential HiTech workforce lies in integrating populations that are at present only narrowly represented in the industry, and practically excluded from it—first and foremost, women, but also the Arab and Jewish ultra-Orthodox populations. A further challenge that emerged from the audit is addressing the shortage of academic staff and reducing the dropout rate of university students from HiTech subjects - this is essential in guaranteeing the next HiTech generation.



4TH THEME:

04

GOVERNMENTAL PLANNING

4TH THEME: GOVERNMENTAL PLANNING

Human capital is found to be strongly correlated with labour productivity and with per capita economic growth. Accordingly, a lack of appropriate investment in developing human capital at all stages of life and work, is liable to lead to low labour productivity and the deceleration of economic growth. The following figure shows labour productivity levels in various OECD countries:

FIGURE 100:
GDP per hour worked, OECD countries and OECD average, 2019 (US$)

Source: OECD data[128]

Thus, achieving economic growth and employment stability in the changing labour market, requires improving the competences and skills of current and future workers. To this end, education systems should prepare their graduates for labour-market changes; programs for adult learning and training should be adapted to the market's new needs; employment services should face the new challenges; and labour market policies should be in line with arising needs. This requires government-wide planning, coordination, and organization aimed at synchronizing and updating all systems relevant to the world of work.

ITALY BASIC WORKFORCE INDICATORS[179]

POPULATION SIZE (2018):

60.4

MILLION

DEMOGRAPHY, ECONOMY, EMPLOYMENT

WORKING AGE POPULATION (2018):

64%

OF POPULATION

GDP (2019):

44,218$

US/CAPITA

EMPLOYMENT RATE (2019):

59.0%

OF WORKING AGE POPULATION

LABOUR FORCE PARTICIPATION RATE (2019):

72.9%

OF 25-64 YEAR OLDS

LABOUR PRODUCTIVITY (GDP PER HOUR WORKED - 2019):

53.3$

US

PART-TIME EMPLOYMENT RATE (2019):

18%

OF EMPLOYMENT

SELF-EMPLOYMENT RATE (2019):

22.7%

OF EMPLOYMENT

TEMPORARY EMPLOYMENT (2019):

17%

OF WAGE/SALARY WORKERS

SHARE OF JOBS AT HIGH RISK OF AUTOMATION OR SIGNIFICANT CHANGE (2019)

50.7%

EMPLOYMENT IN HIGH- AND MEDIUM-HIGH TECHNOLOGY MANUFACTURING SECTORS (2019):

6.3%

OF EMPLOYMENT

EDUCATION, TRAINING, SKILLS

TERTIARY LEVEL EDUCATION (2019):

19.6%

OF 25-64 YEAR-OLDS

ADULT PARTICIPATION RATE IN FORMAL AND NON-FORMAL EDUCATION AND TRAINING (LAST 12 MONTHS - 2016):

41.5%

LITERACY (ADULTS - PIAAC):

70%

AT PROFICIENCY LEVEL 2 OR BELOW (OF 5)

NUMERACY (ADULTS - PIAAC):

71%

AT PROFICIENCY LEVEL 2 OR BELOW (OF 5)

READING PERFORMANCE (15 YEAR-OLDS - PISA):

50%

AT PROFICIENCY LEVEL 2 OR BELOW (OF 6)

MATHEMATICS PERFORMANCE (15 YEAR-OLDS - PISA):

47%

AT PROFICIENCY LEVEL 2 OR BELOW (OF 6)

SCIENCE PERFORMANCE (15 YEAR-OLDS - PISA):

56%

AT PROFICIENCY LEVEL 2 OR BELOW (OF 6)

COLLABORATIVE PROBLEM SOLVING PERFORMANCE (15 YEAR-OLDS - PISA 2015):

35%

AT LEVEL 1 OR BELOW (OF 4)

SHARE OF INDIVIDUALS WHO HAVE BASIC OR ABOVE BASIC OVERALL DIGITAL SKILLS (ADULTS - 2019):

42%

ITALY
BASIC WORKFORCE INDICATORS

POLICY

Government bodies in charge of education and employment policy: Primary and secondary education: Ministry of Education; Tertiary education: Ministry of University and Research; Employment policy: Ministry of Labour and Social Policies.

Public expenditure on active labour market measures (2018): 0.42% of GDP

Gross domestic spending on R&D (2019): 1.45% of GDP

MAIN TRENDS OR CHALLENGES & STRONG POINTS

Education (SDG No. 4): Although the education system has improved in the last 10 years, Italy still ranks among the lowest positions in the EU, having regard to the number of graduates, the dropout rate and the students' skills. According to the 2019 report on the SDGs released by the Italian National Institute of Statistics, important results have been achieved by the Italian education system, especially in the field of women access to education. The level of alphabetisation has significantly improved, but it is still necessary to increase the efforts to reach higher education levels. Indicators show that, in the secondary school, the share of low performing students is still high, both in alphabetical (34.4%) and mathematical (40.1%) skills. Both figures increase in the results of the tertiary school. Moreover, the dropout rate of students aged between 18-24 has lately rose to the 2015 levels, while, at the European level, from 2014 to 2018 a constant decrease has been experienced.

Labour Market: Before the Covid-19 pandemic, despite the feeble stage of the economic cycle, the Italian labour market still showed stable improvement, taking into consideration both the employment (+0.3%) and unemployment rates (10% in 2019, from 10.6% in 2018, maintaining a wide gap with the pre-crisis level, 6.7%). Labour market participation continued to rise, especially because the retirement age for the older categories of workers was postponed under reforms introduced in the last ten years.

In this context, the Italian labour market still struggles with its structural problems, if compared with other European countries. Unemployment rate is still higher than in the euro area, especially in the South of Italy (18,4%) and among young people aged 15-24 (32.2%, with a peak of 48.4% in the South).

In the last ten years, the following trends have been experienced: a rising number of employees with a corresponding decreasing trend in the number of self-employed workers; a polarization effect consisting in reduction in medium qualification jobs and an expansion in high and low qualification jobs; a sharp mismatch between labour demand and educational level; an increasing risk of emigration of highly skilled workers abroad, strictly linked to the imbalance between supply and offer of the job market.

SUMMARY AUDIT REPORT 10

THE COURT OF AUDIT OF ITALY

CITIZENSHIP INCOME SCHEME AND LABOUR MARKET: THE FUNCTIONING OF THE JOB CENTRES

BACKGROUND

The Citizenship Income (Reddito di cittadinanza) has been introduced as a key measure within the Government's actions in the labour market. The new provision has been adopted by Decree Law No.4 of 28 January 2019, later amended and converted into Law 26 of 28 March 2019. The Citizenship Income is an income support scheme for poor households accompanied by measures to encourage beneficiaries to engage in the labour market and find employment.

The relevant legal framework defines the intended beneficiaries of the benefit, the financial eligibility requirements and the total annual sum provided, which depends on the household, income and home ownership status. In 2019, the Budget Law allocated 7.1 billion of public funding to the scheme, of which 5.6 billion for Citizenship Income and 274 million for the continuation of the Inclusion Income. The remaining amount was considered higher expenditure for improving public employment offices (hereinafter also Job Centres) and active labour market policies. According to the same budget law, in 2020 and 2021, the overall allocations amount to 8.1 and 8.3 billion, of which 7.2 and 7.4 billion for benefit disbursement and the rest for Job Centres and active employment policies. A total cost of 8.3 billion has been forecast for 2022 and the following years.

According to the estimates of the Italian National Institute of Statistics and the Government,[180] the new measures was expected to:

1. Reach 2.706 million potential recipients (including both the Citizenship Income and pension), of which 1.791 million of working age (16-64); of these, 57 percent are either employed or seeking employment;
2. Increase the national workforce by 470,000. In 2022, employment was expected to grow by 1.1 percentage points compared to the baseline scenario, with an increase of 260,000 units;
3. Improve the effectiveness of the Job Centres, by recruiting staff with adequate professional skills. Up to now, such structures have proved not to have met the required standards in their role of matching labour demand and supply. In 2018, just 2.1 per cent (23,000 persons) of those who found private-sector

MikeDotta / Shutterstock.com

employment in the previous year did so with their help;
4. Raise the GDP by 0.2 percentage points compared to the baseline scenario in 2019 and in 2020 and by 0.1 percentage points in 2021. After four years, in 2022, the level of the product is expected at 0.5 percentage points higher than that of the baseline scenario. Considering that the overall costs of public funding of the measure ex ante is around 0.4 percentage points of GDP each year, the implicit multiplier on the product is expected at 0.6 in the first year, 1 in the second and 1.1 in the third year.

KEY FACTS

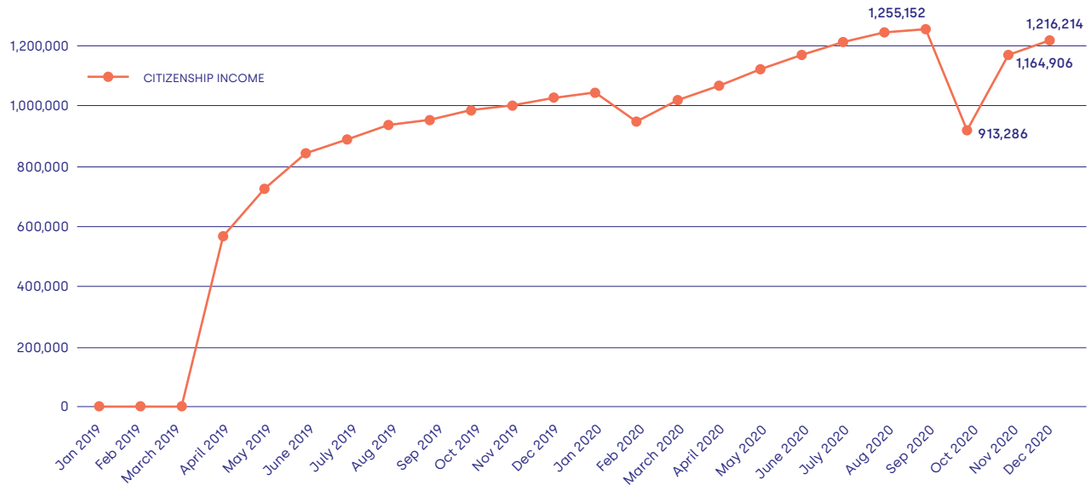
Two years on from its introduction, the Citizenship Income scheme has achieved the following results:

1. Over 1.2 million households have benefited from the income or pension;
2. The programme has reached 2.9 million persons (see fig. 2);
3. The average benefit provided under the programme is 573 euros per month;
4. Due to the impact of the Covid-19 crisis the number of accepted applications for the income has sharply increased (+46%), thus imposing an increase in the funding of the measure for 2021, by 1.2 billion, from 7.4 to 8.6 billion euros;
5. From a geographical point of view,[181] the beneficiaries of the income/pension are predominantly concentrated in Southern Italy (66%), reflecting a less developed economic background; 20% of the beneficiaries are located in the Northern regions, while the remaining 14% refers to the central areas;
6. The geographical distribution at province level highlights a strong positive correlation between the Citizenship Income and the unemployment rate, coupled by a negative correlation with the per capita income (see fig. 103).

FIGURE 101:
Citizenship Income/pension. Total amounts paid monthly (euro thousand)

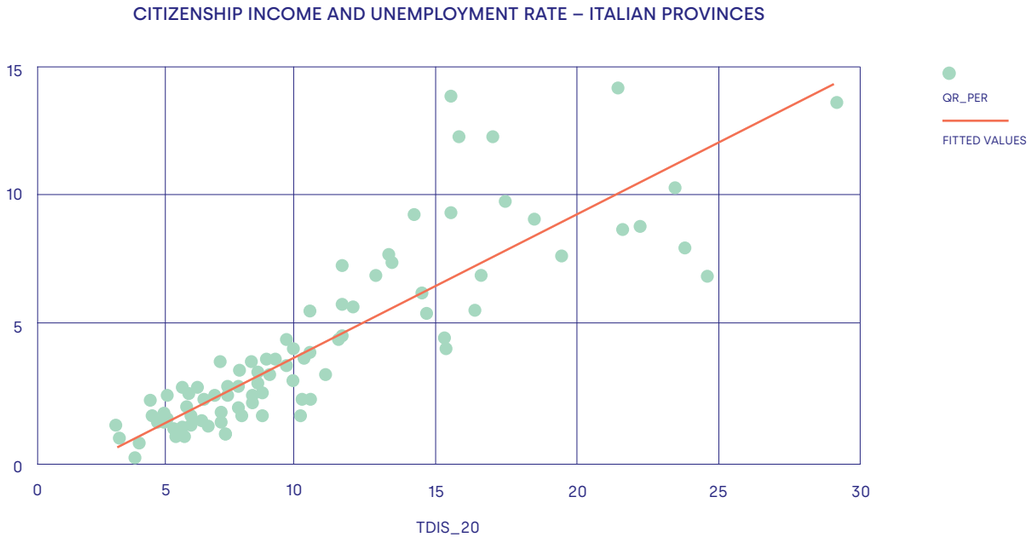
Source: Corte dei conti on data from INPS

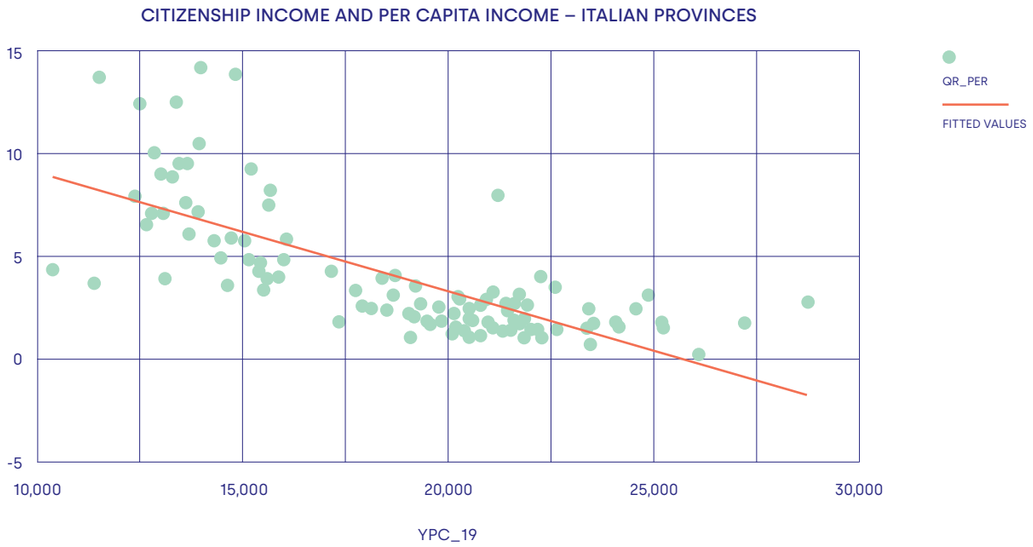
FIGURE 102:
Citizenship Income/pension beneficiaries. Household units' monthly trend since 2019



Source: Corte dei conti on data from INPS

FIGURE 103:
Correlation between Citizenship Income and unemployment rate or per capita income





Source: Corte dei conti on data from INPS.

With specific regard to the second pillar of the Citizenship Income scheme, which involves the active policy on the labour market, a key role has been assigned to the reform and strengthening of the Job Centres, both in terms of human and technological capital. In details, a specific recruitment procedure for skilled staff has been launched.

1. At the end of 2020, 594 Job Centres are up and running, employing over 8.520 staff units, as described in the following table.

TABLE 10:

Year	AREA	REGION	Staff units	% on Grand total	% on the total of the area
2020	NORTHERN ITALY	Piemonte	611	7,17%	18,90%
		Valle D'Aosta	44	0,52%	1,36%
		Liguria	270	3,17%	8,35%
		Lombardia	771	9,05%	23,86%
		P.A. Trento	131	1,54%	4,05%
		Veneto	458	5,38%	14,17%
		Emilia-Romagna	704	8,26%	21,78%
		Friuli Venezia Giulia	243	2,85%	7,52%
	TOTAL NORTHERN ITALY		**3.232**	**37,93%**	**100,00%**
	CENTRAL ITALY	Toscana	865	10,15%	42,42%
		Lazio	975	11,44%	47,82%
		Umbria	199	2,34%	9,76%
		Marche	0	0,00%	0,00%
	TOTAL CENTRAL ITALY		**2.039**	**23,93%**	**100,00%**
	SOUTHERN ITALY AND ISLANDS	Abruzzo	216	2,54%	6,65%
		Campania	0	0,00%	0,00%
		Basilicata	109	1,28%	3,35%
		Puglia	716	8,40%	22,04%
		Calabria	0	0,00%	0,00%
		Sicilia	2.208	25,92%	67,96%
		Sardegna	0	0,00%	0,00%
	TOTAL NORTHERN ITALY		**3.249**	**38,13%**	**100,00%**
GRAND TOTAL 2020			**8.520**	**100,00%**	

2. The Job Centres render diversified services (both front and back-office activities) to job seekers and businesses. In several areas, critical aspects in the staff have been recorded.

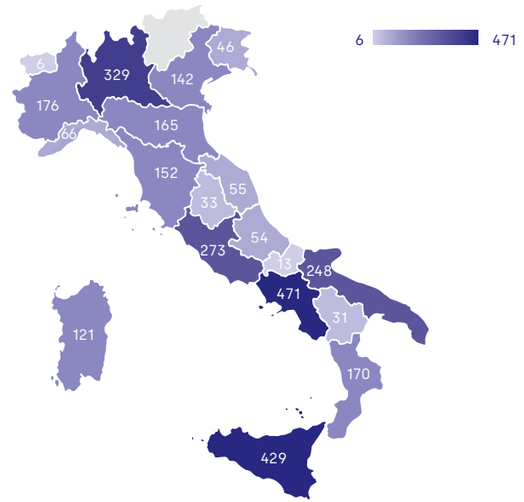
TABLE 11:

	% of JCs which render the service	Average N° of interventions	% of actions with staff criticality
Reception and first information service	99,6	4,8	14
Administrative procedures and profiling	100	3,4	4,4
1st level orientation and service agreement	99,8	5,6	13,7
Specialized orientation	94,7	5,6	29,6
Accompaniment to work	94,9	4,9	25,5
Job demand and supply matching	93,4	4,9	13,6
Internships	96,6	5,5	10,3
Job placement services for disadvantaged people	88	4,1	17
Referral to vocational training	94	3,2	18,5
Business services	98,1	9,6	16,1
Support to starting up new business	79,1	2,3	33,1

3. A recruitment procedure for skilled staff (so called Navigators) has been carried out with the aim of developing tailored plans for job seekers. The geographical distribution of the new hiring is shown in the following figure.

4.

FIGURE 104:
Navigators regional distribution



AUDIT ACTIVITIES/DETAILS

Due to its relevant financial impact and its pivotal role in the Government agenda, the Italian Corte dei conti has dedicated special attention to the implementation of the Citizenship Income measure in all its audit functions. First of all, during the parliamentary discussion of the bill, the Corte dei conti has been asked to express an opinion on the legal provisions under approval, underlining the risks that the benefit, especially in its maximum amount, could end up disincentivizing unemployed people to seek for job positions. Secondly, in the Public Finance Coordination Report for 2020 and 2021 specific chapters have assessed the results stemming from the implementation of the measure, at national level, focusing on the aggregated results of the new twofold measure, both on the poverty reduction and on the active policy sides.

Finally, as the fulfillment of the objectives of the new measures, in terms of increasing the employment rate, rests on the efficient and effective functioning of the Job Centres, in the 2019 audit plan the Corte dei conti has decided to assess the level of implementation of the restructuring procedure of the public employment services offices.

Bearing in mind that, under the Italian constitutional framework, market labour regulation falls within the concurrent jurisdiction of the central and regional governments, the audit had to be carried out on an integrated basis, with the participation of the regional branches of the Corte dei conti under the coordination of the Central audit chamber. So far, three regional branches performed the envisaged audit (Lombardia, Abruzzo and Valle d'Aosta). The audits, both at central and regional level, have been conducted via specific questionnaires and interaction with the national and regional institutions involved in the regulation and organization of the public employment services offices. With this regard, it must be acknowledged that the topic of the audit has been massively affected by the pandemic and the correlated lockdown measures, with a relevant impact on the recruiting procedures of the Job Centres and on their actual functioning.

KEY FINDINGS

Assessment of the functioning of the Job Centres and their preliminary resultss

As regards the second pillar of the Citizenship Income scheme, aimed at promoting active labour market policies, several concerns have been raised in the assessment carried out by the Court.

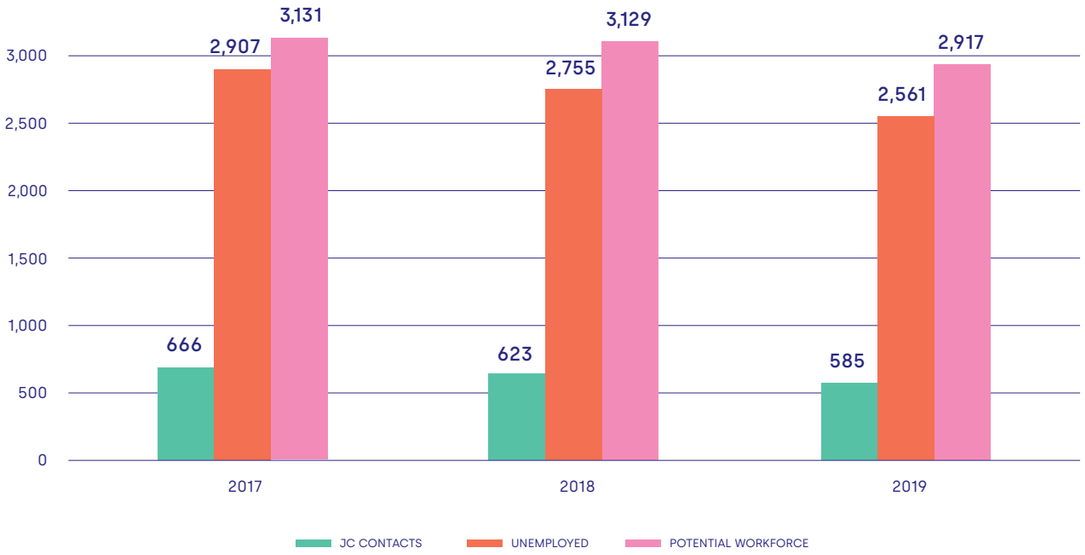
Job Centres did not substantially improve their performance

The available data, communicated by ANPAL Servizi,[182] show that as of 10 February 2020 the beneficiaries of the scheme who found a job after the approval of their application total about 40 thousand. There are no signs of a greater dynamism of the Job Centres than in the past. Micro-data relating to the quarterly labour force surveys (situation at the end of September 2019) processed by the Corte dei conti confirm that the weaknesses of the Job Centres are still all largely in place:

Job Centres keep on lacking attraction

As of September 2019 only a limited proportion of job seekers (23.5%) applied to a Job Centre (compared to 23.3 percent at the end of 2018). The comparison of the last three years figures highlights a reduction (by 12%) in the number of contacts between unemployed people and the Job Centres, together with a decrease in the number of unemployed people (-12%) and in the potential workforce (-7%).

FIGURE 105:
number of contacts with Job Centres, unemployed and potential labour force in the three years 2017-2019 (euro thousand)

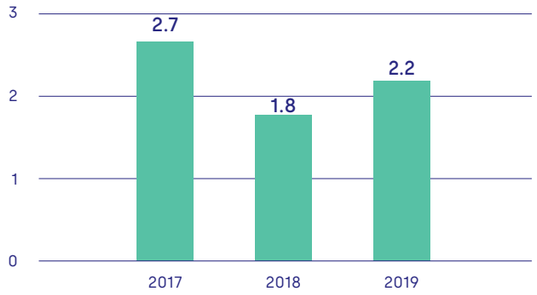


Source: Corte dei conti on data from INPS

Job Centres' low intermediation role in the labour market

The proportion of job seekers finding a job from a Job Centre is extremely low, only 2.2 percent; the role of informal channels (relatives, friends and acquaintances) when seeking a job remains predominant (87.2 percent, compared to 87.9 percent in 2018).

FIGURE 106:
share of unemployed people that have found the current job through the Job Centres: trends in the years 2017-2019



Source: Corte dei conti on Istat data

Job Centres' technological infrastructure still not completed nor fully integrated

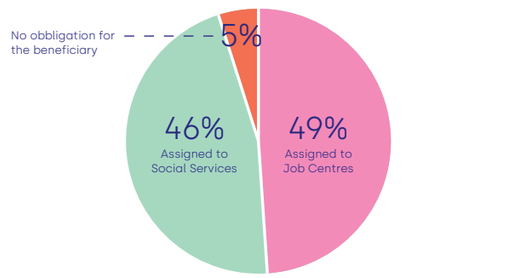
The improvement of the employment services system has involved the creation of a technological infrastructure, to be developed and managed by Anpal; the infrastructure is aimed at starting an integration process between local networks, hardware and software resources, as a basis for crating single electronic files of job seekers in order to better match demand and supply. The new IT system, based on analytical and accurate information (data science), purports to provide reliable and timely data for a constantly updated outlook of the labour market. Data collected by the Corte dei conti show that the implementation of the technological infrastructure is facing considerable difficulties, due to an inadequate IT equipment at territorial level, especially in the Southern Italy, characterized by a strong obsolescence, as well as an internet connection unfit for the new functions of the Job Centres.

At the national level, only 63% of the Job Centres consider their connection adequate for the functions to be performed, while 36 percent are unprepared for the new interconnections and the remaining 1 percent still works offline. Overall, the Internet connection is considered a critical issue in 195 Job Centres: 48 structures in the Northern regions, 39 in the Center and 108 in the South and Islands. In 13 cases, the connection is absent (of which 10 are in the regions of the South and Islands).

The Citizenship Income confirms its nature as a tool for poverty reduction, rather than an active labour market policy measure

For the beneficiaries of the Citizenship Income, various paths are foreseen, depending on the personal situation of the recipient: i) entrustment to employment centers for job search, ii) entrustment to social services for social reintegration, iii) no path or obligation. Figure 107 shows that the number of households composed solely of persons not subject to obligations is equal to 5 per cent (about 51 thousand households) of the total, while those who are assigned to social services reach 46%. These figures underline the high number of families who receive the Citizenship Income and which, being composed solely of persons not subject to obligations, could reside indefinitely in the Program, confirming that the new measure is primarily directed to fight poverty and exclusion rather than the improving the functioning of the labour market.

FIGURE 107:
distribution between paths of the households benefiting from the income



Source: Corte dei conti on data from the Ministry of Labour.

Low effectiveness in matching job demand and supply

ANPAL data on the characteristics of the subjects who referred to the Job Centres (in particular, on those who have entered into a Job Pact and their employability index) show that, as of 1 April 2021, out of 1.6 million potential individuals, just over 1.05 million are required to sign the Job Pact. The indicator that measures the probability of not being employed after 12 months - with values between 0 (easily placed in the labour market) and 1, which represents the highest degree of difficulty in the placement - profiling index, shows values ranging from 0.820 for the North-East to 0.900 for the Islands, and therefore a general low probability of access to employment, with greater distances from the labour market in the Southern Regions. Against this backdrop, as of February 2021, 152,673 people have established at least one employment relationship after the date of submission of the application. 60% of them reside in the South.

KEY RECOMMENDATIONS

Regional audit chambers' recommendations

Several specific audits have been carried out at regional level, in order to assess the implementation status of the public employment services offices reform, under the Citizenship Income scheme.

Recruitment procedure and staff related recommendations

Recruitment procedure should be carried out on a timely, transparent and uniform manner. With reference to the recruitment procedures (irrespective of whether they are managed at the provincial or regional level in the light of the current organizational set-up), it is important that they are defined in a timely manner and with uniform criteria throughout the regions, so as to ensure that the offices can efficiently and effectively support job seekers and companies, while also taking into account the need for transparent selections and the recruitment of qualified personnel. In this context, it is advisable to actually implement the logic of "case management" that characterizes efficient and effective systems of active labour policy, in line with the targets of the recent years' reforms.

Staff units should be efficiently allocated. The distribution of staff resources among the various public employment offices, also taking into account the ongoing recruitment procedures, should reflect the actual needs of the territory, in order to provide qualitatively homogeneous services all over the country.

Proper staff training should be continuously provided. In close connection with the previous point, it will be necessary to ensure a system of continuous staff training, both newly hired and already in force. It should not be forgotten, in fact, that supporting job seekers, especially if unemployed for long time, requires highly qualified personnel, who are able to intercept the needs of people, through strong competences, in the orientation, psychological and legal domain, together with deep knowledge of information systems.

The role of the newly hired "Navigators" should be clearly defined. Defining and monitoring, ex ante and in itinere, the role and the activity to be carried out by the so called "Navigators" (which are subject to collaboration agreements with Anpal Servizi s.p.a, whose activity is related to the content referred to in Article 12 of Law No. 26/2019, to the public notice and to the agreement signed with the Region), in relation to the staff of the employment offices, is pivotal, also to minimize the risk of possible disputes and legal actions.

Technological infrastructure related recommendations

It is recommended that a careful monitoring and maintenance of regional information systems is carried out to ensure the interoperability of data and to actually support the work of the operators of the employment offices. IT investments, carried out to date, must be safeguarded and conducted in line with the latest regulatory provisions referred to in Decree-Law No. 4/2019, with a view to the principle of sound management of public resources. Particular attention should also be paid to the use and exchange of data with private parties, especially in the light of the legislation on the protection of personal data, referred to in EU Regulation No. 679/2016. It will be crucial to overcome the individual provinces' systems, as well as to continue to ensure cooperation with the national bodies responsible for the development of the single information system of labour policies. This aims at ensuring, through the adoption of appropriate organizational measures and actions, the provision of services legally due to users and the functioning of the conditionality mechanisms.

The sound functioning of IT systems is a strategic tool for effective active labour policies, without prejudice, in any case, to the importance of the role of the public employment offices' operators in employment guidance and in activities for supporting users, in a logic of "case management". It is worth stressing the importance of profiling techniques which are not only quantitative, but also qualitative, given the need to intercept the real individual needs.

Single public employment services offices' performance recommendations

It is recommended that a proper monitoring system is put in place in order to make sure that the minimum performance standards are met by all Job Centres, through a comprehensive assessment of the beneficiaries' results and composition. It is therefore important to overcome the problems of lacking or incomplete data, concerning the respect of the deadline for the subscription of the Job and Service pacts.

Public employment offices should also focus their efforts in providing adequate support and hiring services to companies and, more generally, to employers, so that they can find in the employment offices a concrete and reliable subject that intermediates demand and supply of work and that supports them in the recruiting process. To this purpose, the Court recommends that customer satisfaction surveys are carried out at the individual office level, so as to better understand the needs of local undertakings and to trigger the necessary corrective measures.

In view of the changes in the regional system of accreditation of labour services, the monitoring of Job Centres' activities will be essential, also in the light of the role they play as aggregator of networks already in force or to be set up at local level.

With regard to the conditionality mechanisms, it is advisable that the current activities are speeded up. The effective functioning of these mechanisms contributes to the reduction of the possible recourse to forms of illegal work by persons involved in active labour policy paths and in the measure of the Citizenship Income scheme.

Proper anti-fraud mechanism should be built up

Due to the relevant level of financial resources, both national and European, proper internal audit safeguards for the public employment services offices should be developed to prevent, detect and correct conflicts of interest, corruption and fraud, and to avoid double funding initiatives.

CONCLUSIONS

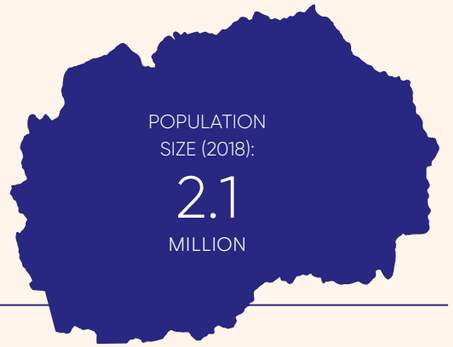
The Citizenship Income programme, almost two years on from its introduction, has confirmed its effectiveness in the fight against absolute poverty. Thanks to the Citizenship Income scheme, the absolute poverty rate may have dropped by 1.5 points (from 8.4 to 6.9 percent). The scheme has also possibly affected income distribution: the Gini coefficient, which measures statistical dispersion intended to represent income or wealth inequality in a nation, appears to have dropped to 31.4%, from 32.5% in 2018.

However, the evaluation of the results achieved by the Citizenship Income scheme needs to take into account several profiles and, beyond its quantitative aspects (e.g. a below-target household involvement rate), there are many points that should be examined with a view to possible improvement, on the basis of the experience built up in the initial years. The amount of resources appears to be unbalanced, to the detriment of large-sized households and those with children and disabled people. There is no rate of involvement of non-Italian families proportionate to the spread of poverty in these segments of the population. There is room for a much larger role of the local social services, compared to that of the Job Centres. The involvement of the third sector in the management of the scheme could be greater. These issues will have to be addressed also taking into account the new economic and social context created by the Covid-19 emergency. Against this backdrop, some aspects will probably have to be better calibrated, also ensuring adequate coordination between the Citizenship Income scheme and several of the measures launched to counter the problems caused by the health crisis, since the establishment, under Article 44 of Decree 18/2020, of the Fund for income of last resort (Reddito di ultima istanza). Another step that needs to be taken, to ensure the scheme's capability to (albeit temporarily) counteract the situations of economic hardship, such as those arising out of the current emergency, is to speedily update the ISEE (indicator of the Equivalent Economic Situation), which measures the financial situation of households, to be able to effectively photograph the actual needs of households.

As regards the second pillar of the Citizenship Income scheme, aimed at promoting active labour market policies, the results appear at present to be largely unsatisfactory and confirm the concerns raised by this Corte from the start. The available data, communicated by ANPAL Servizi, show that as at 10 February 2020 the beneficiaries of the scheme who found a job after the approval of their application total about 40 thousand. Above all, there are no signs of a greater dynamism of the Job Centres than in the past. Micro-data relating to the quarterly labour force surveys (situation at the end of September 2019) processed by the Corte confirm that the weaknesses of the Job Centres are still all largely in place: a) only a limited proportion of job seekers - 23.5 percent - applied to a Job Centre in the year ending September (compared to 23.3 percent at the end of 2018); b) the proportion of job seekers finding a job from a Job Centre is extremely low, only 2.2 percent; c) the role of informal channels (relatives, friends and acquaintances) when seeking a job remains predominant (87.2 percent, compared to 87.9 percent in 2018). These data show that there is still a great deal of room for improvement in Italy, in the services sector, to increase the efficiency of matching labour supply and demand and that the worthwhile challenge of improving Job Centres in Italy has yet to be won.

CarlosBarquero / Shutterstock.com

NORTH MACEDONIA BASIC WORKFORCE INDICATORS[183]



DEMOGRAPHY, ECONOMY, EMPLOYMENT

WORKING AGE POPULATION (2018):

69.8%

OF POPULATION

GDP (2016):

5,129$

US/CAPITA*

EMPLOYMENT RATE (2019):

47.3%

OF WORKING AGE POPULATION**

LABOUR FORCE PARTICIPATION RATE (2019):

73.5%

OF 25-64 YEAR OLDS

PART-TIME EMPLOYMENT RATE (2019):

3.2%

OF EMPLOYMENT

SELF-EMPLOYMENT RATE (2019):

21.08%**

OF EMPLOYMENT

TEMPORARY EMPLOYMENT (2019):

16.7%

OF WAGE/SALARY WORKERS

EMPLOYMENT IN HIGH- AND MEDIUM-HIGH TECHNOLOGY MANUFACTURING SECTORS (2019):

5%

OF EMPLOYMENT

* Based on World Bank data (at the request of North Macedonia SAI) ** Based on North Macedonia State Statistical Office

EDUCATION, TRAINING, SKILLS

TERTIARY LEVEL EDUCATION (2019):

21.3%

OF 25-64 YEAR-OLDS

ADULT PARTICIPATION RATE IN FORMAL AND NON-FORMAL EDUCATION AND TRAINING (LAST 12 MONTHS - 2016):

12.7%

READING PERFORMANCE (15 YEAR-OLDS - PISA):

85%

AT PROFICIENCY LEVEL 2 OR BELOW (OF 6)

MATHEMATICS PERFORMANCE (15 YEAR-OLDS - PISA):

82%

AT PROFICIENCY LEVEL 2 OR BELOW (OF 6)

SCIENCE PERFORMANCE (15 YEAR-OLDS - PISA):

78%

AT PROFICIENCY LEVEL 2 OR BELOW (OF 6)

SHARE OF INDIVIDUALS WHO HAVE BASIC OR ABOVE BASIC OVERALL DIGITAL SKILLS (ADULTS - 2019):

32%

NORTH MACEDONIA BASIC WORKFORCE INDICATORS

POLICY

Government departments in charge of education and employment policy: Ministry of Education and Science (Department of Primary Education, Sector for secondary education adult education and lifelong learning, Department of Science and Innovation, and Department of Higher Education), Ministry of Labour and Social Policy Sector for labour policy and employment policies; Department of Labour Market and Employment, Agency of the Republic of North Macedonia; Sector for active employment measures and services, and Department of Labour Market Research and Analysis.

Public expenditure on active labour market measures (2017): 0.15% of GDP***

Gross domestic spending on R&D (2018): 0.36% % of GDP

MAIN TRENDS OR CHALLENGES

Aging Population: RNM belongs to the group of countries that are demographically characterized by an aging population, accounting for 13.7% of the total population. One of the reasons for the decrease in the proportion of the young population is the emigration, which in recent years, remains relatively high, i.e. 26.8% (which is an estimated data but we do not have official data for total emigration).

Insufficient investment in developing soft skills - critical thinking, teamwork, presentation, problem solving, leadership.

New forms of employment present in the labour market are temporary employments, by concluding temporary employment contracts.

STRONG POINTS

The strong points on the supply side of the labour force are the continuous undertaking active measures and policies aimed at improving the skills of the unemployed, retraining, supporting young unemployed to gain work experience, with a particular emphasis on advanced IT skills training for the unemployed up to 34 years.

*** Based on North Macedonia National Employment Strategy

SUMMARY AUDIT REPORT 11

STATE AUDIT OFFICE OF THE REPUBLIC OF NORTH MACEDONIA

GOVERNMENT PLANNING - EFFECTIVENESS OF GOVERNMENT MEASURES FOR ADDRESSING LABOUR MARKET RISKS AND PLANNING FUNDS FOR OVERCOMING THESE RISKS

BACKGROUND

Labour market movements are crucial for the economic development and employment in the Republic of North Macedonia (RNM). The Government of RNM determines the strategic priorities, development policies and measures, as well as the manner of financing strategic priorities to overcome the differences between demand and supply of labour, and thus to reduce unemployment.

In addition to the strategic documents for detailed presentation of services and programs on the labour market, the Government undertakes different activities through the competent institutions aimed at creating and implementing active employment measures and policies, and their comprehensive impact on the level of employment in the country.

The active employment programs, measures and services determined in the annual operational plans are aimed at improving the labour market functioning by creating and supporting creation of new jobs, increasing employment of the unemployed, in particular young people and beneficiaries of social security financial assistance.

Data on total working age population, active population, employment and unemployment in RNM are basic statistical information necessary for analyzing and monitoring changes on the labour market.

For the period 2017 - 2019, unemployment rate in RNM decreased by 5.1%. Compared to the region, the EU and the Eurozone, the unemployment rate remains high, and is not sufficient to gain the status of a country with low unemployment.

FIGURE 108:
Activity, employment and unemployment rates in RNM in the period 2017-2019

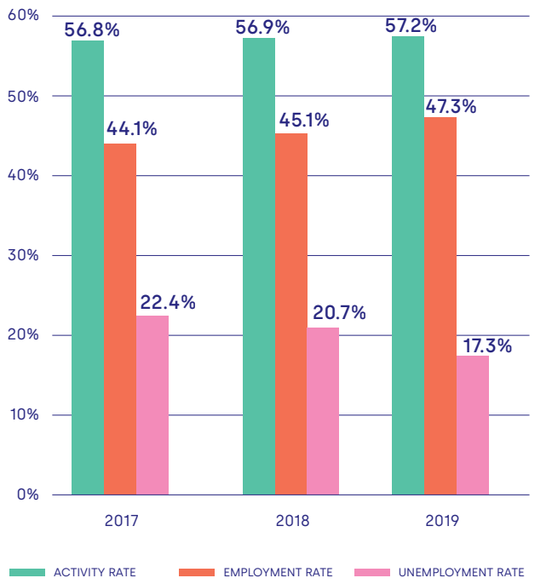
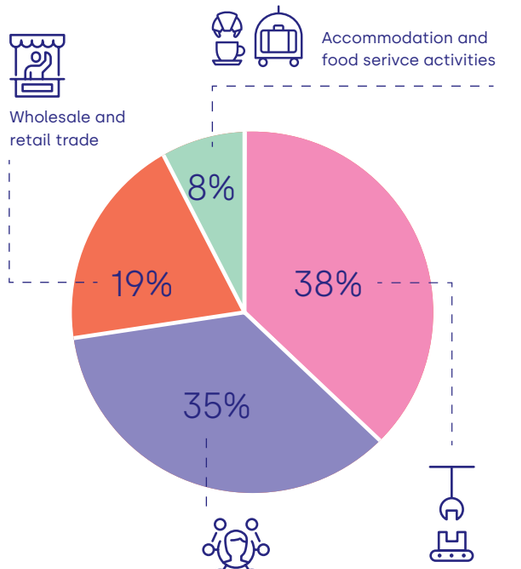


FIGURE 109:
Influx of unemployed persons according to the predominant activity as of 31.08.2020



Source: State Statistical Office of RNM

Impact of COVID-19 on labour market conditions

Despite the trend of gradual reduction of unemployment rate in 2019, with the onset of COVID-19 pandemic the conditions on the labour market have changed significantly and acquired completely new indicators. COVID-19 pandemic has intensified and expanded globally, with huge impact on public health, economies and labour markets. The pandemic also has strong impact on the economic development of small and medium enterprises, especially those engaged in crafts, trade, tourism, hospitality, etc.

Unforeseen reduction in economic activity causes decline in employment i.e. an influx of unemployed people from several sectors. **According to the predominant activity of the employer,** out of the total number of unemployed persons, the largest influx of 37.7% is from the processing industry, 19.3% from wholesale and retail trade and 8.2% from accommodation and food service activities.[184]

To support the citizens and the economy to deal with the negative effects of COVID-19 pandemic, the Government has adopted three packages of economic measures. The purpose of the measures is to retain as many jobs as possible and to help the economy. The total value of the three packages of economic measures is 550 million euros or 5 - 5.5% GDP.

KEY FACTS

20%

Participation of young people in the total number of unemployed – the number of active job seekers is 101,748 in 2019

2.5%

Percentage of employed through active measures and policies in relation to the total unemployed persons registered in the Employment Agency (189,211 persons)

30.5%

Percentage of youth unemployment in 2019, which is 6.5% less compared to 2018

24%

Young people waiting for employment for a period of 1 to 3 years

AUDIT OBJECTIVE

The audit objective was to answer the question: "Are the policies, measures and activities taken by the competent institutions effective and contribute to increasing employment, improving skills in line with labour market demand and retaining staff by offering quality employment opportunities, taking into account available resources of institutions and the manner of their use?"

The audit team carried out activities that focused on several areas, as follows:
- Legal framework, strategic documents and position of institutions in creating and implementing labour market policies;
- Measures, activities and effects for improving employment;
- Use of resources;
- Control mechanisms.

AUDIT SCOPE

In the period from January to October 2020, the State Audit Office conducted performance audit on the topic "Government planning - Effectiveness of government measures for addressing labour market risks and planning funds for overcoming these risks". Audit subjects were the measures and activities taken as determined in the strategic documents, planning and implementation of measures, and policies and services for employment on the labour market for the period 2017-2020. The performance audit covered the following entities: Ministry of Labour and Social Policy, Employment Agency of RNM, Ministry of Education and Science, State Statistical Office, Chamber of Commerce of RNM, Ministry of Interior, Office of the Prime Minister of RNM, Ministry of Health, Medical Faculty Skopje and Ministry of Economy.

KEY FINDINGS

Weaknesses in the legislation on division of duties and responsibilities in adoption, implementation and supervision over the implementation of active employment programs and measures:

Principal legal act that regulates the issues of labour exchange, rights and obligations of employers, unemployed persons, other job seekers, and other issues of importance for employment is the Law on Employment and Insurance in Case of Unemployment.

The Law on Employment and Insurance in Case of Unemployment does not fully regulate the preparation, the holder/competent institution and the period of adoption of the operational plan as an annual operational document for active employment programs and measures.

Clearly defined responsibilities, definition of competencies and coordination process create preconditions for transparency in the work of the institutions, in particular the work of the Employment Agency of RNM, as a public institution with significant role in the implementation of activities aimed at increasing employment in RNM.

Partial implementation of main strategic documents and action plans in accordance with goals set:

The basic strategic and planning documents that define employment priorities in RNM are National Employment Strategy of RNM 2016-2020, National Action Plan for Youth Employment 2016-2020, the Youth Guarantee, etc.

The National Employment Strategy of RNM 2016-2020 is a document that contains midterm employment strategies. Its implementation is consistent with the Action Plan for Employment 2018-2020. Each measure in the Action Plan has defined activity, realization indicator, timeframe, financial assets and competent institutions for implementation.

Mediation as an employment service aims to facilitate the link between labour supply and demand. The analysis of realization of set indicators presented a trend of decrease i.e. the projected 5% increase of the participation of the Employment Agency in employment mediation was not achieved.

Action Plan for Youth Employment 2016-2020 and Youth Guarantee measure were adopted for overcoming the challenge concerning youth employment at national level, with focus on the areas that are key to promoting youth employment.

The analysis of implementation of basic strategic documents that create policies in the field of labour market and education system aimed at increasing employment and quality of jobs, presented incomplete implementation of strategic goals, as a result of insufficient realization of indicators for some activities under the competence of the Employment Agency and the Ministry of Education and Science.

Setting indicators for future realization should be based on analyses, so as to be reasonably achievable in line with planned timeframe, available human capacities and changes in the labour market.

Lack of criteria and comprehensive analyses as a basis for planning, creating programs and employment measures:

Labour market employment programs, measures and services are defined within the Operational Plan for active employment programs, measures and services, which is prepared annually by the Ministry of Labour and social policy based on employment policies set out in the national strategic documents. With the performed audit, we found that the Ministry of Labour and Social Policy as the holder of the Operational Plan, has not adopted internal procedures or guidelines for more detailed regulation and description of the planning process with clearly defined criteria.

The planning is not sufficiently supported by detailed analyses of sustainability and efficiency of active programs and measures implemented in previous years, which would confirm the benefits or weaknesses of the same, in particular when abolishing measures and introducing new ones for the period 2017-2019.

The ascertained state of affairs of lacking criteria for the manner of planning and thorough analyses of the effectiveness of employment programs and measures may have an effect on the efficiency of interconnection of job seekers and employers.

Implementation of employment programs and measures:

The analysis for the period 2017-2019 showed that the contribution from implementation of active programs and measures which resulted in employment in relation to the number of unemployed persons/active job seekers, ranges from 4 - 5% per year. The percentage of employed persons in relation to the total number of registered unemployed persons in the Employment Agency ranges from 2.2 - 2.5% per year. The realization of programs and measures is within the available funds.

Antonio Guillem / Shutterstock.com

Non-compliance of young people's skills with labour market demands:

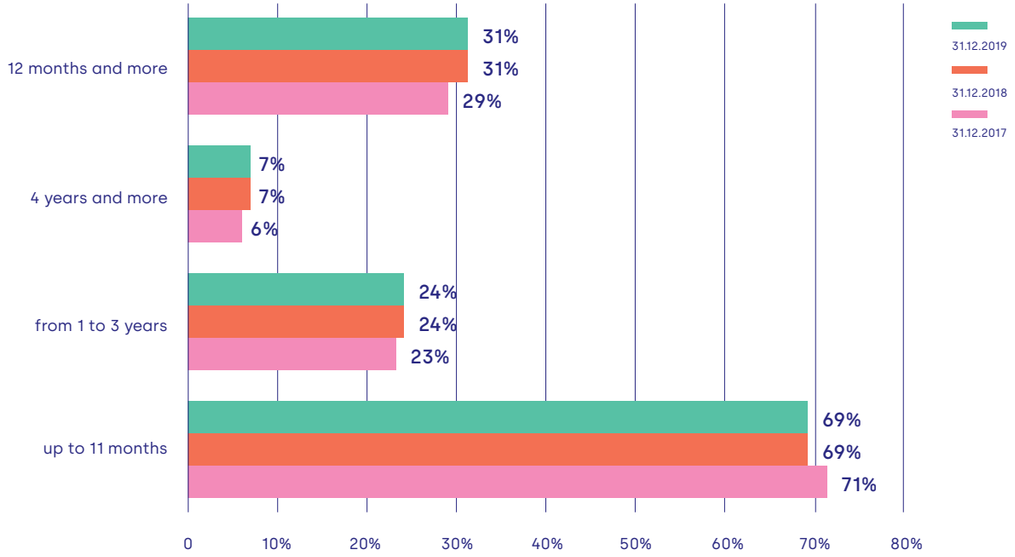
Young people in RNM face difficulties in the transition from education to the labour market. Significant number of young people are long-term unemployed, which in time lose the acquired knowledge and skills, their productivity decreases, and thus their chances of finding a job.

One of the challenges in the field of youth employment is the connection between the needs of the labour market and the skills of young job seekers. The high rate of youth unemployment is an indicator for this situation (39.2% in 2017, 37% in 2018, 30.5% in 2019).[185]

By analyzing data from 2018 compared to 2017, we can see that the unemployment rate of young people aged 15-29 has decreased by 2.2%, and in 2019 compared to 2018 by 6.5%. This decline in the unemployment rate is a result of measures and activities aimed at young people at the labour market, but the effects of the outflow of young working age population in other countries should also be taken into account. Despite the measures taken and the declining trend of youth unemployment, a high unemployment rate is still observed.

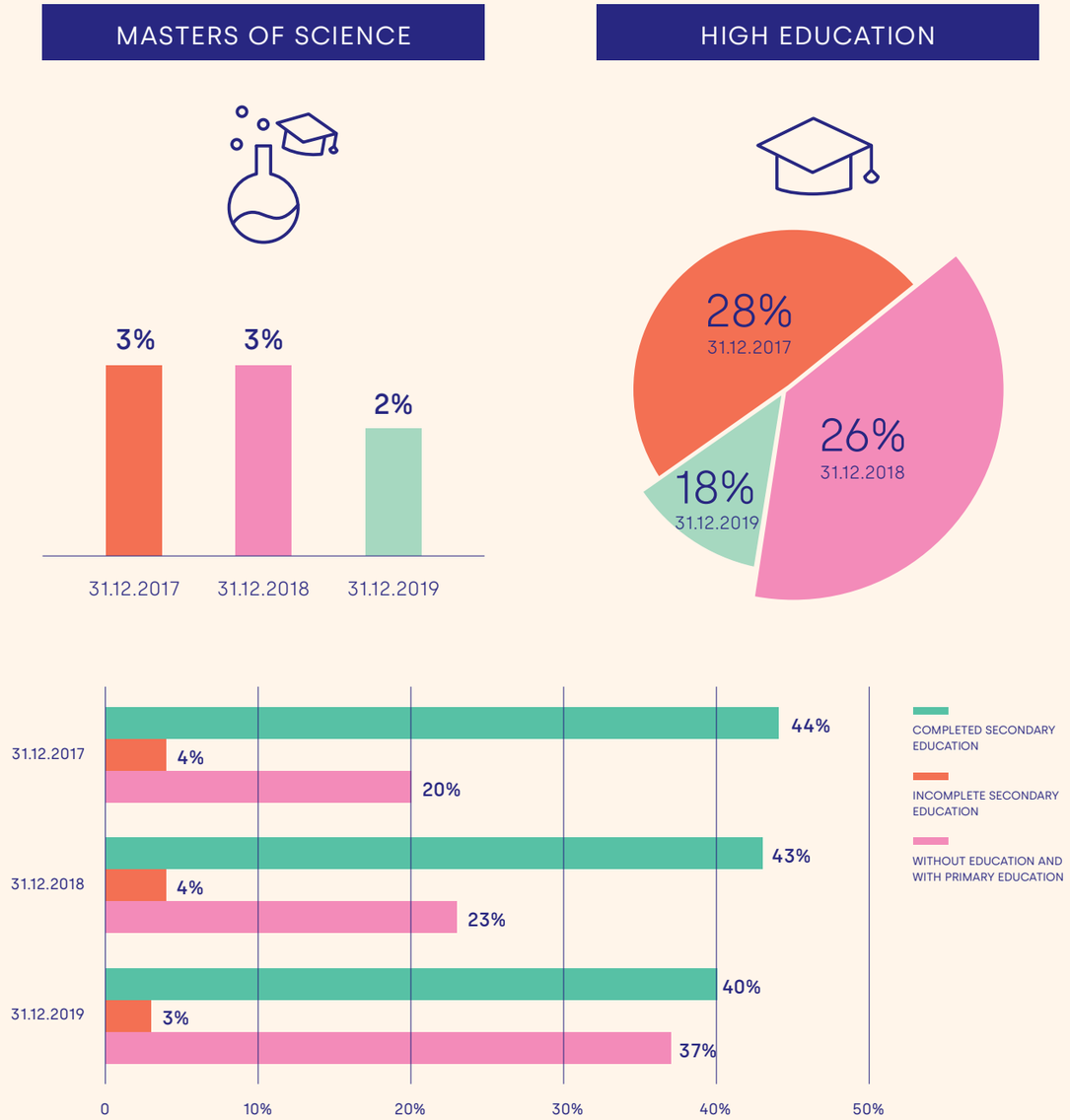
The structure of unemployed young people is dominated by individuals with completed secondary education (40%), followed by individuals without education and with primary education, which has a growth trend of 20% in 2017 to 37% in 2019. For individuals with higher education, there is a declining trend of unemployment from 28% in 2017 to 18% in 2019, which is largely due to the emigration of highly educated individuals to other countries.

FIGURE 110:
Waiting period for employment 2017 – 2019



Source: Employment Agency of RNM

FIGURE 111:
Structure of unemployed individuals by educational attainment



Source: Employment Agency of RNM

Although a number of measures and services for improving skills and knowledge of the unemployed are implemented on the labour supply side, there is still a significant discrepancy between the quality, knowledge and skills of the unemployed and those that are in demand on the labour market. Linking the needs of employers and the available workforce remains major challenge that largely depends on the interest of candidates, but also on the quality of jobs.

At the end of 2014, the Ministry of Education and Science started activities for development of Skills Observatory, as a strategic tool for determining activities and analyzing the adequacy of skills of students in correlation with the needs of the labour market for continuous improvement of curricula in line with the requirements of employers. The Observatory should offer information on the employability of certain professions, the expected waiting time for a job and the level of income by educational profile etc.

The Skills Observatory as a tool is completed. However, it does not produce data due to delays in the implementation of planned activities, despite the fact that its start and generation of reports have been planned every year in the period 2017-2020 within the planned, program and strategic documents of the Ministry of Education and Science, and in many other important strategic documents.

The delay in the implementation of planned activities with the Skills Observatory as a strategic tool for analyzing adequacy of skills in correlation with labour market needs is reflected in the creation of educational policies and employment policies.

Permanent outflow of highly educated individuals:

The analysis of several strategic documents[184] indicates that emigration of highly qualified workforce known as "brain drain" is more evident, i.e. lack of certain profiles who most often emigrate from RNM in more developed countries, such as medical staff, engineers, IT experts, professionals and scientists, students of technical and natural sciences. Estimates and analyses from the World Bank indicate that by 2010, 29.1% of highly educated individuals live and work outside of RNM, and according to the latest data and the analysis published in 2019 the rate is particularly high and is almost 40% or more than one third of highly educated individuals.

Data on emigration movements of highly educated individuals available to the competent institutions in RNM are not complete and do not reflect the real situation. The weaknesses and the reasons behind the inconsistent application of the legal obligation are primarily due to lack of information and inefficiency of citizens to report the stay abroad longer than three months, but also due to insufficient sanctions for law violators.

To address the risks in the field of population migration, the Government of RNM has adopted Resolution on the migration policy of the Republic of Macedonia 2015-2020. To address the outflow of highly educated individuals, the Ministry of Education and Science has prepared National Strategy for networking, cooperation and reduction on the outflow of highly educated and professional individuals 2013-2020[187] with established goals and activities. Regardless of the adopted documents for dealing with legal emigration, there are no regular reports on the level of implementation of measures, assessment and monitoring thereof. Therefore, the effects of reducing intensity of permanent emigration, in particular intellectual emigration, cannot be determined by continuously addressing the reasons for the migration intentions.

Ascertained conditions indicate that there is no sufficiently coordinated and systematic approach for creating policies and monitoring the process of implementation of the envisaged goals and activities aimed at overcoming the trend of continuous outflow of highly educated individuals. This is becoming a serious problem that changes the labour supply and contributes to increasing non-compliance with labour demand.

Lack of professional and administrative capacities:

Human and financial resources available to the Employment Agency of RNM and continuous improvement, promotion and modernization of these resources are of great importance for realization of activities and achievement of desired results.

The large number of vacancies in the central office of the Employment Agency of RNM and the large volume of

cases impose the need to strengthen and continuously improve HR capacities for successful implementation of employment policies and measures and for achieving desired results and effects on the labour market overall.

Lack of criteria for determining the volume of financial resources and their distribution per programs, measures and employment services:

Financial resources are important prerequisite for successful implementation of planned active measures and services on the labour market. Despite the increasing trend on annual basis, their share in the total expenditures of the Employment Agency of RNM is decreasing at the expense of funds realized for Passive Employment Measures.

There is a lack of criteria for planning, determining and allocating funds by measures, policies and services.

Due to lack of criteria for real planning of financial resources per measures, policies and services, there is larger interest in certain employment measures than the envisaged scope, while for other employment measures funds remain unused.

Lack of established process of monitoring and evaluation of implementation of employment programs and measures:

The Law on Employment and Insurance in Case of Unemployment does not regulate the competence for monitoring and assessment of effects of active employment programs and measures, i.e. it does not regulate the need to introduce evaluation of programs, measures and services.

Since 2014, no external evaluation of employment measures and policies and services on the labour market has been performed with assessment of effects of their implementation on the labour market, as well as the possible need to modify and improve the same.

Therefore, it is necessary to continuously evaluate the performance of active employment programs and measures and services on the labour market, as well as to set targets and monitor their implementation.

Addressing above weaknesses is of significant interest given that a sound system of continuous evaluation of measures, programs and services on the labour market create preconditions for transparency in creating new programs, measures and employment services.

KEY RECOMMENDATIONS

The authorized state auditor made recommendations for overcoming ascertained conditions, in the area of government measures for addressing labour market risks and planning funds for overcoming these risks.

Weaknesses in the legislation:

Ministry of Labour and Social Policy to take on activities for legal regulation of the holder, the competent institution and the period of adoption of operational plans for active employment programs and measures and services on the labour market.

Partial implementation of main strategic documents and action plans in accordance with goals set:

Employment Agency of RNM to take on actions for realization of activities in line with planned dynamics in strategic documents.
Competent persons in the Ministry of Labour and Social Policy in cooperation with the Employment Agency of RNM, to take on activities for realization of planned reforms on facilitated access of young people to the Youth Guarantee measure.

Lack of criteria and comprehensive analysis as a basis for planning, creating programs and employment measures:

Competent persons in the Ministry of Labour and Social Policy in cooperation with the Employment Agency of RNM to base the preparation of the Operational Plan on detailed analysis of sustainability and efficiency of active employment programs and measures and services on the labour market and to introduce periodic evaluations of programs, measures and services by external evaluators, to confirm benefits or weaknesses thereof.

Implementation of employment programs and measures:

Employment Agency of RNM to take on activities for introducing novelties and innovations to increase attendance and information of the unemployed on the services provided by the Agency.

Non-compliance of young people's skills with labour market demands:

Ministry of Education and Science to take on actions for intensification of activities for creation of the necessary preconditions for data collection for the needs of the Skills Observatory and implementation of the foreseen analyses.

Permanent outflow of highly educated individuals:

Competent ministries,[188] as members of the Interdepartmental Group on Migration Policy, to undertake activities for operating and informing the Office of the Prime Minister about the implementation of identified activities in the Action Plan for Migration Policy.
Ministry of Education and Science to take on activities for determining the level of realization of planned goals and activities in the National Strategy for networking, cooperation and reduction of outflow of highly educated professionals 2013-2020.

Lack of professional and administrative capacities:

Employment Agency of RNM to undertake activities for providing necessary human resources for performing the main activity.

Lack of criteria for determining the volume of financial resources and their distribution per programs, measures and employment services:

Employment Agency of RNM to take on activities for determining criteria for resources and their distribution per programs, measures and employment services.

Absence of an established process of monitoring and evaluation of the implementation of employment programs and measures:

Employment Agency of RNM to undertake activities for strengthening controls during implementation of measures in the implementation of monitoring over the active programs and measures for employment and services on the labour market.

CONCLUSIONS

The audit scope and evidence obtained with the application of audit techniques and methodology provides a basis for expressing the following conclusion: The established measures and policies together with the laws, strategic documents, program and planning documents and the activities undertaken by the competent institutions for implementation of the employment policy are aimed at improving the employment, i.e. reducing unemployment rate.
Taking into account the ascertained state of affairs, the authorized state audit found that policies, measures and activities taken by competent institutions are not effective enough to provide employment and skills in line with labour market demand and overcome the trend of continuous outflow of staff from the country. There is a need for coordinated action and strengthening of activities of competent institutions for creating policies and measures aimed at increasing employment, improving skills in line with labour market demand and retaining staff by offering quality employment opportunities.

INSIGHTS

FROM THE COOPERATIVE PROJECT

INSIGHTS FROM THE COOPERATIVE PROJECT

As part of the cooperation between SAIs on this parallel audit project, each SAI contributed - alongside its summary report - some further information and insights relating to work being done in its country to address workforce 2030 challenges. Below we present examples and case studies of state policies in this context. We then present examples of additional assignments undertaken by participating SAIs which are relevant to our general topic and express the SAIs commitment to it. Finally, we present some general insights and directions for the future which emerged as a result of our cooperative project.

CASE STUDIES AND EXAMPLES OF STATE POLICIES ADDRESSING WORKFORCE 2030 CHALLENGES

The participating SAIs offered examples of policies that their governments are implementing with regard to the challenges the workforce is facing in a changing labour market. **The examples and case studies presented in this section are not to be considered best practices, and most of them were not audited.** Rather, they were collected in order to present interesting or innovative initiatives that may be of common interest in this context.

BULGARIA

ONLINE PLATFORMS

MyCompetence: An online platform which offers information on models of sector competences for key positions; job descriptions; assessment tools; e-learning resources and other specialised services for assessment and development of workforce competencies. The development of MyCompetence was motivated by the need to tackle a number of challenges related to mismatches between the labour supply and demand in terms of knowledge, skills and competencies. MyCompetence includes more than 370 competence models of key job positions in 25 economic sectors. Each competence model encompasses description of the job position, tasks and responsibilities, qualifications required as well as knowledge, skills and competences. Competences are grouped in three clusters: core competencies, managerial competencies and specific competencies. Competences are in line with the National Qualifications Framework. MyCompetence provides self-assessment tools for the identification of skills gaps and an e-learning platform for upskilling. MyCompetence was developed by the Bulgarian Industrial Association in cooperation with two national trade unions.

Portal for Analyses and Forecasts for the Labour Market Development: A public web-based information system interactively presenting the results of forecasts for the labour market in Bulgaria. The Ministry of Labour and Social Policy aims to present the labour market forecasts in an easier and more user-friendly way. The system generates information based on various criteria and time-periods set by the users. Assessment of the effects of the active labour market policy and various sectoral analyses can be found as well. The portal also provides useful links to the National Statistical Institute population projections, the Ministry of Finance macroeconomic forecast, the European Commission economic forecasts, the CEDEFOP skills forecast and employer surveys on skills' needs.

Database of Adult CVT Trainings: The database is being created on the NAVET website. While searching the database of adult CVT trainings, different criteria can be used, such as location, profession, or specialty. The search results in information about the course title, location, training institution, course dates and level of professional qualification.

NATIONAL HIGHER EDUCATION MAP

In 2020, an amendment to the Higher Education Act envisages a reform, related to the adoption of a National Higher Education Map in the Republic of Bulgaria, which will determine the profile and territorial structure of higher education in Bulgaria in terms of occupational fields and specialities of the regulated professions, taking into account social and economic development and the needs of the labour market.

ANALYTICAL STUDY OF THE GENERATIONAL CHARACTERISTICS OF THE WORKFORCE

In 2020, an analytical report about study of the generational characteristics of the workforce in Bulgaria was prepared. The report can be defined as good practice, as it is of significant value and presents the differences in values, characteristics and attitudes, incl. the adaptability of generations to changes, attitudes towards learning and intergenerational communication. The report also analyzes staff shortages and clashes between different age groups, and presents key conclusions and recommendations.

EU

THE EUROPEAN COMMISSION'S COMMUNICATIONS ON EDUCATION

The Communication on School Development and Excellent Teaching For A Great Start In Life provides evidence and proposes actions to improve the quality and inclusiveness of school education, the competences of teachers and school leaders, and school governance. In its Communication on Building a stronger Europe: the role of youth, education and culture policies, the Commission has proposed a second package of initiatives highlighting the key role played by education, youth and culture in building the future of Europe. Furthermore, the Commission Communication on Strengthening European Identity through Education and Culture sets out the vision for a European Education Area. It identifies mobility, the mutual recognition of diplomas and study periods abroad, language learning, Early Childhood Education and Care, the teaching profession, and innovation and digital technologies as key areas for EU cooperation in the field of school education.

EU VET POLICY

The vision of the Advisory Committee on Vocational Training - assisting the European Commission - for the future Vocational Education and Training (VET) by 2030 says that the European VET systems by 2030 should aim to:

- Deliver excellent and inclusive education and training that offer opportunities for both economic and social cohesion;
- Support competitiveness and growth and smart, inclusive and sustainable development;
- Foster democratic citizenship and European values thus helping all individuals to develop their full potential in a lifelong learning continuum.

The EU VET policy vision up to 2020 is set in the Bruges Communiqué and Riga Conclusions and is firmly embedded in the ET 2020 framework. This vision has further evolved through the adoption of:

- A number of Council Recommendations (EQF, EQAVET, ECVET, Validation) and Europass Decision
- The 2016 New Skills Agenda for Europe with the objective to make VET a first choice
- Digitising European Industry (2016)
- The proclamation of the European Pillar of Social Rights in 2017
- Council Recommendations on Upskilling Pathways, Tracking Graduates and European Framework for Quality and Effective Apprenticeship;

The Commission's work on VET is supported by two agencies: CEDEFOP (European Centre for the Development of Vocational Training) and ETF (European Training Foundation).

The ET2020 benchmark for vocational training aims at an EU average of at least 6% of 18-34 year-olds with an initial vocational education and training (IVET) qualification should have had an IVET-related study or training period (including work placements) abroad lasting a minimum of two weeks, or less if documented by Europass.

ADULT LEARNING IN THE EU

European Council Resolution on a renewed European Agenda for Adult Learning (2012) highlights the need to significantly increase adult participation in formal, non-formal and informal learning whether to acquire work skills, for active citizenship, or for personal development and fulfilment. The Agenda outlines a vision of how adult learning should develop in Europe by 2020 and sets out five priorities for the years 2015 – 2020.

European Council Recommendation on Upskilling Pathways (2016) aims to help adults acquire a minimum level of literacy, numeracy and digital skills or a specific upper-secondary level qualification (level 3 or 4 in the European Qualifications Framework (EQF)).

The European Commission has set up an ET2020 Working Group on adult learning consisting of national experts, representatives of European social partners and civil society members. The group exchanges and analyses information, and develops policy guidance in the field of adult learning based upon best practices taken from across Europe. In ET2020 there is a benchmark for lifelong learning, according to which an average of at least 15% of adults should participate in lifelong learning. Lifelong learning is also referred to as adult learning, meaning the participation of adults aged 25-64 in education and training. The current EU average (2018 data) is 11.1%.

FINLAND

REFORM FOR LIFELONG LEARNING

The Government of Finland has planned a reform to improve people's capacity in Lifelong Learning in Finland. The government has decided to formulate the reform together with all parliamentary parties and with organizers of education in Finland.

ISRAEL

"EMPLOYMENT 2030" COMMITTEE

The "Employment 2030" Committee was active in 2017 - 2020 under the Minister of Labour, Social Affairs and Social Services with members of 11 other public entities. Its objective was to formulate recommendations aiming to improve: labour market participation of under-represented groups; skill level of workers and adjustment to changing labour market needs; and Government preparedness to the future labour market. The committee worked with four sub-committees: Employment goals, labour productivity and structural changes; Workforce, human capital and vocational/technological trainings; The changing labour market and lifelong learning; and Employment programs for target populations. The committee performed in depth analysis and provided the Minister in August 2020 with a comprehensive report including numerous recommendations.

ONLINE LEARNING PLATFORM - CAMPUSIL

The governmental Digital Israel Initiative operates since 2018 the CampusIL website, a central tool for adult learning, offering a variety of free online courses for independent learning - vocational training courses, 21st century skills (including job-seeking skills, languages and digital skills), academic courses, and professional development courses. In 2020, about 250 courses were active on the website. As independent digital learning does not suit all learners, some courses are offered in a Blended Learning format, where the students use the online platform while being accompanied by human instructors.

POLICIES TO INCREASE THE POTENTIAL FOR THE HIGH-TECH SECTOR

The Initiative of the Ministry of Education to increase the number of students taking the highest level (five-unit) exams in technological and scientific subjects ("Double the 5's") succeeded in doubling the number of students matriculating in five-unit mathematics—from 9,000 in 2013 to 18,000 in 2018. An increase was noted also in the number of students taking the five-unit exams in physics, chemistry, biology, computer science and system design and programming. Similarly, the Council for Higher Education has set a target for a 40% increase in the number of undergraduate students majoring in HiTech subjects. By the academic year 2018/2019, the number of university students majoring in HiTech subjects, increased by 40%, compared to academic year 2015/2016.

ITALY

HIGH TECHNICAL INSTITUTES

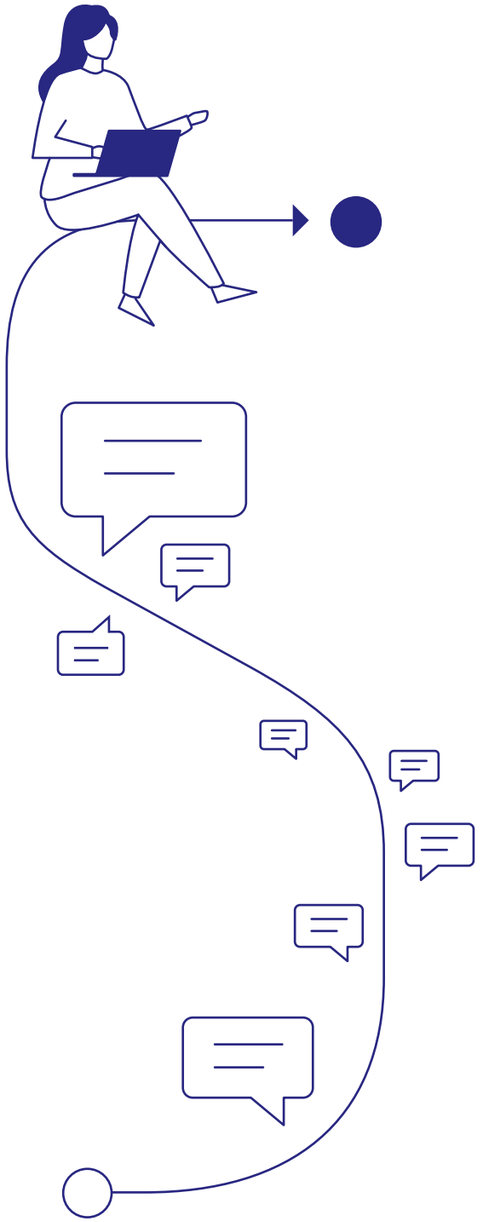
The high technical institutes are top-class centres, highly specialised in technology, in connection with the production industry. They were set up in 2010 to train skilled technicians in strategic areas for Italy's economic development and competitiveness. The educational programmes of the high technical institutes aim at meeting industry's needs in terms of new high-level technical and technological skills to promote innovation. They are placed at Level 5 of the EQF (European Qualifications Framework) and give a technical level qualification, after a four semester training course, linked to 6 technological areas (sustainable mobility, new technologies for life, new technologies for "Made in Italy" products, innovative technologies for cultural heritage and tourism, information and communication technologies, energy efficiency). The courses award credits recognized by universities. Since 2010, 95 high technical centres have been set up. They include 2,153 partners, 826 of which are businesses, 429 active courses, 6,267 business engaged in traineeship programs. According to the data of the 2018 national monitoring study of the High Technical Institutes conducted by the Ministry of Education, University and Research, in 2016, 82.5% graduates from high technical institutes (ITS) have found work within a year from graduation, 87.3% of whom in an area related to their studies. In the light of the achieved results, the National Recovery and Resilience Plan, recently approved in the context of the European Next Generation EU initiative, envisages reforming the ITS and further strengthening them by investing 1.5 billion euros in their development.

INTEGRATED SKILLS

"Alternating School and Work" programme was adopted in 2015 in order to promote "integrated" skills, updated by the Budget law for 2019, with the aim of promoting transversal skills and school orientation. The programme is addressed to High School [upper secondary school] students and allows them to alternate periods at school and periods at work. The mandatory minimum number of hours for school-work alternation is: 90 hours in High schools, 150 hours in technical schools and 210 in vocational schools.

NATIONAL PLAN FOR DIGITAL EDUCATION

The Government has implemented several actions and plans in order to meet the UN 2030 Agenda objectives which are related to education. Within the goal No. 4.4, the Government adopted The Italian National Plan for Digital Education (Piano Nazionale Scuola Digitale — PNSD). This plan has been developed by the Ministry of Education, University and Research with the aim of setting up a global innovation strategy in the Italian school system and bringing it into the digital age. It involves actions aimed at: 1) equipping schools with innovative teaching tools and classrooms, based on new digital technologies; 2) promoting and strengthening the students' digital skills; 3) providing adequate digital training to teachers. The Budget Law for 2019 set territorial training teams - a task force of 120 teachers in the country - for supporting and assisting schools in methodological and educational innovation, with special regard to new technologies. The 120 teachers will be relocated and will teach in specialized schools. They will promote the culture of educational and methodological innovation in the schools of covered areas. With this regard, new investment projects, amounting to 2.1 billion euros, are included in the National Recovery and Resilience Plan, to transform schools in connected learning environments, with technologically advanced laboratories and job-oriented teaching approaches.



KOREA

DIGITAL NEW DEAL POLICY

The policy aims to create an integrated online-offline learning environment for primary, middle, and high schools, universities, and vocational training institutions throughout the nation. To this end, the government plans to invest total KRW 1.3 trillion (USD 1.15 billion) by 2025 to build up digital education infrastructures for all primary, middle, and high schools nationwide, and to strengthen online education for the nation's universities and vocational training institutions.

NORTH MACEDONIA

KEY STRATEGIC DOCUMENTS, PLANS, AND PROGRAMS

- National Employment Action Plan 2018 – 2020

- National Employment Strategy 2016-2020
  The National Employment Strategy of RNM 2016-2020 defines strategic priorities that have a basic goal: increasing employment, job quality and productivity, with a special focus on vulnerable groups. The specific activities for achieving the goals are defined by the National Action Plan for Employment 2018-2020 which contains activities for achieving the established strategic priorities and goals.

- Youth Employment Action Plan 2016-2020
  The Youth Employment Action Plan 2016-2020 predicts strategic goals and a series of key results to be achieved by 2020 to improve youth employment.

- Employment and Social Policy Reform Program 2020
  The Employment and Social Policy Reform Program is in line with the Employment Strategy, the Youth Action Plan, as well as operational plans for active employment programs and measures and labour market services and other relevant documents.

- Operational plan for active employment programs, measures and services
  Labour market employment programs, measures and services are defined within the Operational Plan for active employment programs and measures and services, which is prepared on an annual basis based on the employment policies set out in the national strategic documents. The holder of the Operational Plan is the Ministry of Labour and Social Policy, and the procedure for its implementation is under the competence of the Employment Agency of the RNM in cooperation with other partners in the implementation through the Operational Guidelines for active programs and measures for employment and services on the labour market. The Operational Plan identifies: employment programs, measures and services that will provide job creation, support for job creation and increase the employability of the unemployed, especially young people and beneficiaries of the right to financial assistance from social protection and acquiring additional knowledge and skills to increase their employability and competitiveness in the labour market.

ADDITIONAL RELEVANT AUDITS PERFORMED OR PLANNED BY THE PARTICIPATING SAIS

Rising to the challenges of the changing labour market could become a key audit topic for SAIs these days, as the challenges are varied and many, holding a potential and acute impact on the lives of many people around the world. To show the commitment of supreme audit institutions to this significant field, we compiled - within the international cooperation on Workforce 2030- a number of examples of other audits prepared by the participating SAIs in recent years, or audits planned for the coming years, relating to the wide array of sub-topics of Workforce 2030:

NATIONAL AUDIT OFFICE OF BULGARIA

Performance audit "Vocational education for employment" (2016): The audit concludes that, during the audited period, the activities performed by the Ministry of Education and Science are not sufficiently effective to provide conditions for conducting quality and effective school vocational education for the needs of the labour market. Main Findings:

- The adopted VET Strategy is without a vision and strategic objective, which leads to the lack of a clearly formulated direction for the future development of vocational education and to unclear result of the policies, implemented with relation to the labour market needs.

- There is no system for improving the quality of vocational training, career development opportunities for teachers and encouraging the involvement of young professionals as vocational teachers in the vocational education system.

- The existing network of vocational high schools and schools with vocational classes is not consistent and linked to the socio-economic characteristics of the region.

- There is no unified system for planning the state admission plan based on research, identification and forecasting of the needs for vocational education and training (VET) and a working mechanism for cooperation with employers' organizations, branch organizations and municipalities, which creates risk of detachment from the real needs of the labour market.

- During the audited period, there is no system for monitoring the realization of students who have completed vocational education, which does not create conditions for effective management of the vocational education system.

Performance audit "Monitoring Graduate Career Outcomes" (2017): The audit concludes that the monitoring of the professional fulfilments and migration of university graduates is not effective considering: the need for improvement of the system which traces the fulfilment of university graduates; lack of uniform national policy on managing the migration of highly-skilled people, lack of responsibilities on collection and analysis of the information about these processes at the national level and lack of systems for monitoring the migration processes by the competent authorities and on a national level. Significant effectiveness has been achieved in monitoring the realization of university graduates at the national level through rating system of higher schools, despite its inherent limitations.

Strategic planning: As a result of the Bulgarian National Audit Office's strategic planning process in 2020, several audit areas / sub-areas have been identified for the period 2021-2023 that are relevant to the topic of the parallel audit. These are the areas: scientific infrastructure, employment, E-education – preparedness of the educational system for transition to e-learning, mechanism for development and management of national programs for development of education, support of people with disabilities, national research programs. Specific proposals for audit tasks will be made in the course of the annual planning of the audit activity. The focus of the BNAO's efforts in 2021 will also be on the funds spent in connection with the COVID-19 pandemic.

EUROPEAN COURT OF AUDITORS - ECA

SR 22/2018 – "Mobility under Erasmus+: Millions of participants and multi-faceted European Added Value, however performance measurement needs to be further improved". We found that: Erasmus+ Mobility provides European Added Value in many ways in addition to those required in the legal basis, such as a strategic approach to mobility, an increase in sense of European identity and multilingualism; Most of the targets for the indicators set in the legal basis are being met. However, these indicators are not fully aligned with the general and specific objectives set out in the Regulation making performance measurement difficult.

SR 6/2018 - Free Movement of Workers: The fundamental freedom ensured but better targeting of EU funds would aid worker mobility: We found that the tools put in place by the Commission ensure the freedom of movement of workers but deserve to be better known. The similarity of the respective objectives of the two EU funds supporting labour mobility (ESF and EaSI) make complementarity between them challenging and weaknesses in the monitoring system hamper the evaluation of the funded actions. Finally, the EURES portal of vacant posts in the EU will only develop into a true European placement tool if shortcomings such as the low rate of vacancies published on it are addressed.

SR 5/2017 - Youth unemployment: Have EU policies made a difference?: This report examines the progress made by the EU Youth Guarantee in ensuring that under 25's receive an offer of employment, education, apprenticeship or training within four months of leaving school or becoming unemployed. It also evaluates the Youth Employment Initiative, which increased financial support for those struggling the most. We found limited progress and results which fall short of expectations with regard to providing a good quality offer to all NEETs (those not in employment, education or training). We make a number of recommendations both to the Member States and to the European Commission to improve the current and future initiatives in the area of employment

SR 16/2016 - EU education objectives: Programmes aligned but shortcomings in performance measurement" (2007-2013 and 2014-2020 programme periods), which concluded that while EU education objectives have been adequately considered OPs, the performance of the audited projects could not be systematically demonstrated due to the insufficient use of quantified objectives and performance indicators. In addition, the audit highlighted that there is not always a clear link between education measures and their impact on participants' employability.

NATIONAL AUDIT OFFICE OF FINLAND

Provision and reforms of employment services in 2015–2019 (2020):
- TE (employment) administration was relatively well placed to provide TE services (employment services).
- The reforms made to improve the employment situation were implemented as planned

Digitalization of teaching and learning environments in general education (2019):
- The steering and management of digitalization are complicated by a weak knowledge base and unclear premises for the steering
- The promotion of digitalization requires clarifying the basic premises and direction, experimenting, and well-functioning steering instruments

Entrepreneur education as part of vocational labour market training:
- Entrepreneur education has little direct impact on central government Finances
- Inadequacy of objectives and monitoring data makes it difficult to assess entrepreneur education
- Entrepreneur education provided the participants with better employment prospects but generated little income for them

THE OFFICE OF THE STATE COMPTROLLER AND OMBUDSMAN OF ISRAEL

Improving labour market inclusion of the Arab-Israeli population (2016):
- No strategic plan to narrow disparities
- Inadequacies in training and work-placement programs for the Arab-Israeli population
- Shortcomings in the Public Service actions to increase employment of Arab-Israelis

Inspection of education in the ultra-Orthodox Jewish schools (2020):
- Ultra-Orthodox schools teach less basic subjects, such as language and math, than other schools, and do worse on standardized exams in those subjects
- Most students in ultra-Orthodox schools do not participate in national exams
- Inspection of some ultra-Orthodox schools is very narrow

Appointment and training for new school principals (2021):
- The program for training principals trains an insufficient number of principals compared to demand
- At the same time, many of those trained do not go on to be principals, or leave the profession shortly after
- There is no coherent codex for the role and responsibility of principals

Government measures for the unemployed during the COVID-19 pandemic

Remote learning and teaching during the Covid-19 pandemic

THE COURT OF AUDIT OF ITALY

In the past years, the Italian Court of audit has already dealt with the public policies aimed at improving the Italian labour market, by carrying out performance audits on:

The level of implementation of the measure "Youth Guarantee Programme" (2018): Aimed at addressing the problem of young people classified as NEET (Neither in Employment nor in Education or Training) which highlighted:
- only 42,5 per cent of the young people taking part to the project ended up with a job proposal, mainly with apprenticeship contracts;
- divergent outcomes between the North and the South of Italy, reflecting the different level of efficiency in the local public administrations.

The degree of implementation of the smart working (namely teleworking) in the central Public Administrations (2019): The audit shows that only a small number of administrations have effectively carried out smart working programmes. The main obstacles were identified in the difficulties in reorganising work processes and in cultural bias towards the new tools.

The public funds invested in the scientific and technological research (2020): Which showed several critical aspects:
- complicated financing procedures;
- delays in the use of allocated resources, with the risk of definitely losing them at year end;
- it has been therefore recommended that the decree allocating the funds is timely adopted.

The funds aimed at financing scholarships (2020): Critical areas have been pointed out with regard to:
- the provision of scholarships, accommodation but also other services that improve the living conditions of students (transport, teaching materials, catering, access to culture, etc.);
- fragmentation in the services standards provided throughout the territory.

The level of implementation of the restructuring procedure of the public employment services offices, within the citizenship income scheme (ongoing)

Future planning: The EU has responded to the Covid-19 pandemic and its economic consequences on the member states by approving several measures, the most relevant of which consisting of creating a new recovery tool "Next Generation EU", which will be embedded in the long-term EU budget. Within the new tool, the EU will offer financial support to member states, both in the form of grants and loans, throughout the new Recovery and Resilience Facility. Italy will have access to these European funds by approving its Recovery and Resilience plan. According to the draft budgetary plan for 2021, recently approved by the Government, part of these funds will be invested in the labour market and education policies, by financing structural reforms aimed at providing adequate income replacement and access to social protection, notably for atypical workers; mitigating the employment impact of the crisis, including through flexible working arrangements and active support to employment; supporting women's participation in the labour market through a comprehensive strategy, including through access to quality childcare and long-term care; improving educational outcomes, also through adequate and targeted investment, and strengthening distance learning and skills, including the digital ones. The Italian SAI will be closely involved, in the next future, in auditing the use of the European funds, in order to assess whether they have been effectively and efficiently spent, in line with the principle of sound financial management.

THE BOARD OF AUDIT AND INSPECTION OF THE REPUBLIC OF KOREA

Audit on Current Status of Vocational Education and Capacity Building Programs: Improving the method of calculating grants reasonably that are provided for a remote training for workers' vocational education and capacity building

Audit on Operation and Management of Vocational Training Programs: Suggesting measures to strengthen safety management for OJT-participating companies by, for example, increasing involvement of occupational health and safety specialists during the OJT of vocational high schools

Audit on Operation of Labour Safety Net: Sharing vocational training information among institutions that perform vocational education and capacity building programs to improve quality of vocational training

STATE AUDIT OFFICE OF THE REPUBLIC OF NORTH MACEDONIA

Audit of Financial Statement Elements and Compliance Audit of the Employment Agency of the RNM for 2018: The three main findings identified in the audit are:
- Weaknesses in the implementation and payment of funds for active employment programs and measures;
- Incomplete documentation and no evidence of monitoring;
- Unverified payment of funds for active employment programs and measures.

Audit of Compliance of activities and measures taken by the beneficiaries of the Special Fund Assets of the Employment Service Agency of the RM for 2016 - Final Report 2017: The three main findings identified in the audit are:
- Weaknesses and uncertainties in the legislation;
- Untimely decision-making for allocation of non-refundable funds from the Special Fund;
- There are no control activities.

Performance Audit: "Realization of higher education staff in the labour market in the RNM" - conducted in 2019: The three main findings identified in the audit are:
- Underdeveloped system for monitoring students after graduation;
- The percent of people with higher education waiting for employment above 36 months has increased;
- Insufficient regulatory mechanisms to strengthen the link between education and the labour market needs.

Planned audit: According to the annual programs of the SAI North Macedonia, audits are planned to cover some of the institutions listed in the report.

INSIGHTS FOR THE FUTURE - THE CHALLENGES OF THE CHANGING LABOUR MARKET PRESENT EXTENSIVE AUDIT OPPORTUNITIES FOR SAIS

The technologies and social trends that are reshaping the labour market are already making an impact. Just recently, the economic and employment crisis stemming from the COVID-19 pandemic highlighted the importance of investing in the human capital for current workers, future workers (children and youths) and the unemployed - in order to increase their employability in a changing labour market. It is therefore up to governments everywhere to respnd, and prepare for further transformations, throughout the various systems that are affected: public employment services; education systems; vocational and educational trainings; adult education programs; other public employment measures; higher education systems; and public service management. This report aspires to contribute to raising awareness to the challenges and opportunities of Workforce 2030, in the national governments of the participating SAIs, as well as in other countries.

"By cooperating, we strengthen society, uphold common values, develop our cultural identities and share knowledge. Cooperation is therefore the only reasonable option for governments and, at the same time, for the Supreme Audit Institutions, if they wish to play a major part still in the future", as the INTOSAI GUID 9000 on Cooperative Audits between SAIs points out.[189] Accordingly, INTOSAI Strategic Plan for 2017-2022 has set a goal to encourage SAI cooperation (SG3), and EUROSAI Strategic Plan for 2017-2023 aims at "Supporting effective, innovative and relevant audits by promoting and brokering professional cooperation" (SG1).

While environmental audits have been leading the way for cooperative audits for the past few years, the challenges of the changing labour market are often just as global and of mutual concern, as governments everywhere are searching for ways to adapt and prepare. It is therefore an excellent arena for cooperation between SAIs, and as such, EUROSAI has welcomed the "Workforce 2030" project under the auspices of SG1. It is worth mentioning, that the project relates directly to some of the UN SDGs, by which it also underscores the priority set by INTOSAI for member SAIs to support the implementation of the SDGs and assist in their follow-up and review.

In light of the wide-ranging implications of labour market transformations - both for citizens and for government agencies, partnered with the global significance and correlation with sustainable development, the participating SAIs in the "Workforce 2030" project, call upon other SAIs to take up the challenges of the changing labour market as a key audit topic in near future, whether in national or international audit projects.

The participating SAIs acknowledge the diversity of issues stemming from workforce challenges, and therefore are themselves committed to continue auditing various aspects of this topic.

Moreover, the COVID-19 pandemic and ensuing economic and employment crises, have put extra pressure on labour markets, requiring still greater efforts on the part of governments to ensure the resilience of their workforce. SAIs have the power and competence to hold their governments accountable in this respect, through up-to-date audits on the evolving challenges resulting from labour market changes.

Finally, SAIs have an important role in safeguarding the livelihood and rights of citizens, in promoting SDGs, and in ensuring government efficiency and effectiveness - all of which are threatened by the ever-changing demands from the workforce. SAIs may take a leading part in promoting solutions towards a new equilibrium.

INTRODUCTION

Page 10

back to page

1. The technological changes in communications and information technologies are amplified by developments in artificial intelligence, the internet of things, robotics, autonomous vehicles, three-dimension printing, biotechnology, nanotechnology, and quantum computing. World Economic Forum, **The Fourth Industrial Revolution** [link]; OECD, **Employment Outlook 2019: The Future of Work** (2019) p.3.

2. OECD, **Getting Skills Right: Engaging low-skilled adults in learning** (2019) p. 2.

Page 11

back to page

3. McKinsey Global Institute, **Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation** (2017), pp. 66-67; Berger & Frey, **Digitalisation, Deindustrialisation and The Future of Work** (OECD Working Papers No. 193, 2016), pp. 22-25; OECD, **Job Creation and Local Economic Development 2018: Preparing for the Future of Work** (2018), p. 6.

Page 12

back to page

4.Nedelkoska & Quintini, Automation, Skills Use and Training (OECD Social, Employment & Migration Working Papers No. 202, 2018), p. 7. Another extensive study has shown that in 2017 workers in automatable jobs were asked to carry out an average of 4.3 fewer tasks than in 2010, while other workers were asked to carry out an average of 2.9 fewer tasks. In addition, mid-range jobs are shrinking in the face of the growth of higher- and lower-paying jobs: MIT-IBM Watson AI Lab, **The Future of Work: How New Technologies Are Transforming Tasks** (2019) pp. 3-4

Page 12 [cont.]

back to page

5. McKinsey Global Institute, **Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation - executive summary** (2017), p. 2; McKinsey Global Institute, **The future of work after COVID-19** (Feb. 2021), p. 128, 84.

6. The terms "skills, capabilities, competences" are used more or less interchangeably in the employability discourse. This report will use the term most appropriate in each context.

7. WEF, **The Future of Jobs Report 2018**, p. viii. Another global survey found that about 67% of employees believed that they must continuously reskill themselves to stay in their career, and 58% believed that they would have a new career within five years. Deloitte, **Future of Work: the people imperative** (2017), p. 4.

8. Soft skills include a wide range of skills and competences. The figure presents only a few examples.

9. MIT-IBM Watson AI Lab, Fleming et al., **The Future of Work: How New Technologies Are Transforming Tasks** (2019), p. 4; An analysis of tens of millions of online job advertisements posted between July 2018 and September 2020 in 27 European countries (with the exception of Britain) rated the skills most demanded by employers - CEDEFOP [link, 18.3.21].

10. McKinsey Global Institute, **Skill Shift Automation and the Future of the Workforce** (2018) - Based on data from the United States and 14 Western European countries. In light of dynamic labour markets, predictions are difficult; there are alternative estimations, stressing the growth in demand in professions that do not require high-level skills, such as some of the care-giving professions.

Page 14

back to page

11. UN General Assembly resolution A/RES/70/1 - **Transforming our world: the 2030 Agenda for Sustainable Development** (25.9.2015). See also **Education 2030: Incheon Declaration and Framework for Action for the implementation of Sustainable Development Goal 4** (2015).
The ILO adopted in June 2019 the **ILO Centenary Declaration for The Future of Work** (21.6.19), sec. III-A (p. 5); see also ILO, **Work for a Brighter Future: Global Commission on the Future of Work** (2019), p. 30 onward.
UNESCO's **Belém Framework for Action** - CONFINTEA VI (2010) called for the advancement of lifelong learning for all; Adult learning and education is part of the lifelong learning challenge: UNESCO, **Recommendation on Adult Learning and Education** (2015).
See also similar recommendations of the Brookings Institute - Muro et al., **Automation and Artificial Intelligence** (Brookings, 2019), p. 9.

Page 17

back to page

12. OECD, Getting Skills Right: Assessing and Anticipating Changing Skill Needs (2016), pp. 8-9; OECD, Getting Skills Right: Creating responsive adult learning systems (2019), p. 5.

13. OECD, **Getting Skills Right: Assessing and Anticipating Changing Skill Needs** (2016), pp. 7-9; **Good Practice in Adapting to Changing Skill Needs**, pp. 49-52; **Getting Skills Right: Creating responsive adult learning systems** (2019), p. 6. Finland [link]

01 THEME

Page 18

back to page

14. A NEW SKILLS AGENDA FOR EUROPE: Working together to strengthen human capital, employability and competitiveness, COM/2016/0381 final [link]; European Skills Agenda for sustainable competitiveness, social fairness and resilience, COM/2020/274 final [link].

15. Council Recommendation of 22 May 2018 on key competences for lifelong learning (4.6.18) [link]. Competences are defined as an integration of knowledge, skill and attitude.

16. EU, **Key competences for lifelong learning** (8.7.19) [link].

Page 19

back to page

17. **OECD Employment Outlook 2020**: Worker Security And The Covid-19 Crisis, p. 22.

18. **OECD Employment Outlook 2021**: Navigating The Covid-19 Crisis And Recovery, p. 4.

19. **OECD Employment Outlook 2021**, p. 17.

Page 20

back to page

20. **OECD Economic Outlook**, Interim Report March 2021: Strengthening the recovery - The need for speed, p. 8; **OECD Employment Outlook 2021**, p. 4, 17

21. **OECD Economic Outlook**, May 2021, p. 21.

Page 21

back to page

22. **OECD Economic Outlook**, May 2021, pp. 12, 14-15.

23. **OECD Economic Outlook**, May 2021, p. 12.

24. **OECD Economic Outlook**, May 2021, p. 26.

25. **OECD Economic Outlook**, May 2021, p. 20, 27.22. OECD Economic Outlook, May 2021, pp. 12, 14-15.

Page 22

back to page

26. **OECD Economic Outlook**, May 2021, p. 27.

27. **OECD Employment Outlook 2020**, pp. 12-13, 23; **OECD Employment Outlook 2021**, p. 19.

Page 23

back to page

28. **OECD Employment Outlook 2021**, p. 17.

29. **OECD Employment Outlook 2021**, pp. 5, 69.

30. **OECD Employment Outlook 2020**, p. 4.

Page 32

back to page

31. UN, **Transforming Our World: the 2030 agenda for sustainable development** (2015); target 4.4 for instance, is to sustainable increase, by 2030, the number of youth and adults who have relevant skills for employment; UN, **Education 2030 Incheon Declaration and Framework for Action** (2015).

Page 34

back to page

32. Indicators are based on OECD or EUROSTAT data, unless otherwise stated. Indicators are presented for the most recent year available in these sources as of June 2021. **PIAAC** is the OECD's Programme for the International Assessment of Adult Competencies. The major survey conducted as part of PIAAC is the Survey of Adult Skills, conducted among people aged 16-65. The Survey measures adults' proficiency in key information-processing skills - literacy, numeracy and problem solving; gathers information and data on how adults use their skills at home, at work and in the wider community; and measures the key cognitive and workplace skills needed for individuals to participate in society and for economies to prosper. Data is shown from the 2015 survey.

PISA is the OECD's Programme for International Student Assessment. PISA measures 15-year-olds' ability to use their reading, mathematics and science knowledge and skills to meet real-life challenges. Data is shown from the 2018 results, unless stated otherwise.

Page 38

back to page

33. https://www.oph.fi/en/statistics-and-publications/publications/new-national-core-curriculum-basic-education-focus-school

Page 39

back to page

34. Statistics from 2019

Page 40

back to page

35. OECD Future of Education and Skills 2030, Learning Compass 2030, 2019: https://www.oecd.org/education/2030-project/contact/OECD_Learning_Compass_2030_Concept_Note_Series.pdf

36. Perusopetuksen opetussuunnitelman perusteet 2014. https://www.oph.fi/fi/koulutus-ja-tutkinnot/perusopetuksen-opetussuunnitelman-perusteet.

Page 42

back to page

37. FINEEC publication ”Näkymiä OPS-matkan varrelta, 2020”. https://karvi.fi/app/uploads/2020/01/KARVI_0520.pdf.

Page 43

back to page

38. FINEEC publication ”Näkymiä OPS-matkan varrelta, 2020”. https://karvi.fi/app/uploads/2020/01/KARVI_0520.pdf.

Page 47

back to page

39. FINEEC publication ”Näkymiä OPS-matkan varrelta, 2020”. https://karvi.fi/app/uploads/2020/01/KARVI_0520.pdf.

Page 54

back to page

40. Indicators are based on OECD or EUROSTAT data, unless otherwise stated. Indicators are presented for the most recent year available in these sources as of June 2021. **PIAAC** Data is shown from the 2015 survey. **PISA** Data is shown from the 2018 results, unless stated otherwise.

Page 56

back to page

41. Eli Eisenberg and Omer Selivansky Eden, **Adapting Israel's Education System for the Challenges of the 21st Century** (The Israel Democracy Institute, Policy Paper 130, 2019), based on a meta-analysis of 75 publications from the years 2000-2016: Van Laar et al., "The Relation Between 21st-Century Skills and Digital Skills: A Systematic Literature Review", Computers in Human Behavior (2017) 72, pp. 577-588.

42. The skills are presented in descending order, by the number of publications that mentioned each skill (the numbers in parentheses), signifying the level of academic consensus on the necessity of the skill.

Page 57

back to page

43. United Nation, A/Res/701, "Transforming our world: the 2030 Agenda for Sustainable Development" (25.9.15) - Goal 4.

44. Incheon Declaration and Framework for action for the implementation of Sustainable Development Goal 4 (SDG4) - "Education 2030" (May 2015). OECD - The Organization for Economic Co-operation and Development. In 2020, the organization had 37 developed member countries, among them the United States, Great Britain, Germany, and France.

45. Epistemic knowledge is knowledge about knowledge, knowledge about how we know things in various disciplines such as history or mathematics. Procedural knowledge is needed in order to understand how something is made or constructed - the series of actions or steps taken to achieve a goal.

46. Meta-cognition is high-level cognitive activity, including active monitoring of skills such as thinking, planning, assessing, etc. It is one's ability to consciously think about one's own thinking.

47. The Program for International Student Assessment (PISA) is an international OECD survey that measures literacy level among 15-years-old in three areas: reading, mathematics and science knowledge. The test is conducted every three years. At the time of publication, the most recent one was from 2018.

Page 59

back to page

48.Based on the Pedagogical Climate and Environment report for the school year 2018/19 prepared by the National Authority for Measurement and Evaluation in Education.

49. During the audit, the State Comptroller' Office distributed a questionnaire among the principals of all secondary schools in all sectors, regions and supervision types. The questionnaire was sent to 1,961 principals and 757 responded (39%).

50. “Pedagogical flexibility” is the possibility the MOE gives education institutions to make decisions and act independently in pedagogical matters, for example - the curricula, time management, students management, educational methods and approaches, teaching, learning and evaluation, and use of teaching resources to provide a response to unique local needs.

Page 61

back to page

51. The Future-Oriented Pedagogical Policy paper was published in 2016 and surveyed future trends and challenges for the education system, as well as the anticipated required skills; The 2nd Version Future-Oriented Pedagogical Policy paper was published in 2019; The Mapping of the Pedagogical Secretariat paper is a 2019 paper mapping the extent to which Education 2030 skills are incorporated in the curricula of 12 subjects in lower-secondary schools.

Page 63

back to page

52. Head supervisors were asked, for each skill, to what extent they believe it should be part of their subject-curriculum and to what extent is it in fact. The rated each skill on a 1 to 5 scale (1 being 'not at all'; 5 being 'to a great extent'). The figure presents averages of the responses.

Page 64

back to page

53. According to the MOE’s definition, higher degree thought develops problem-solving, information analysis and critical thinking skills.

Page 65

back to page

54. Most Israeli schools are part of the State education system which is operated by the State and serves its residents. The State education system includes these sectors: State-Jewish education (non-religious), Orthodox State-Jewish education (religious, non-ultra-Orthodox), ultra-Orthodox State-Jewish education, and Arab education.

Page 67

back to page

55. OECD, **Education at a Glance** (2018).

Page 71

back to page

56. Data from the "Education Institutions Search System", November 2019, processed by the State Comptroller.

Page 71 [cont.]

back to page

57. Lower secondary schools, upper secondary schools and six-year schools; data from the ICT Administration as of the end of 2018, processed by the State Comptroller.

58. Lower secondary schools, upper secondary schools and six-year schools; data from the ICT Administration as of the end of 2018, processed by the State Comptroller.

59. During the audit, the State Comptroller' Office distributed a questionnaire among the principals of all secondary schools in all sectors, regions and supervision types. The questionnaire was sent to 1,961 principals and 757 responded (39%).

60. The questionnaire enables to draw conclusions with a certainly of 95% and a sample error of ±2.8%.

Page 72

back to page

61. The Central Bureau of Statistics ranks and groups settlements in Israel to clusters, based on their socio-economic status - from cluster 1- weakest settlements, to cluster 10 - strongest settlements.

Page 73

back to page

62. The ultra-Orthodox (or "Haredi") Jewish population in Israel is a non-homogeneous religiously-devout group with its own lifestyle and characteristics, who comprise about 12% of Israel's population. Most ultra-Orthodox Jews live in closed communities, and their children attend schools dedicated to their society - there are about 1,500 primary and secondary ultra-Orthodox schools (as of 2018). These schools focus on religious studies, and generally teach less general studies (such as mathematics, science, and English).

02 THEME

Page 86

back to page

63. OECD, **Strengthening the Governance of Skills Systems:** Lessons from Six OECD Countries (2020).

64. Active Labour Market Policies (ALMPs) include public spending on measures for improving the chances of individuals to enter the labour market, to improve earnings, or to prevent already employed individuals from losing their jobs. ALMPs include various measures, from training to job search assistance. They differ from passive policies that mostly include unemployment or early retirement benefits.

Page 87

back to page

65. Analysis of the data at OECD.Stat: **Public expenditure and participant stocks on LMP**. [link]

66. Such as temporary employment; part-time and on-call work; temporary agency work and other multiparty employment relationships; as well as disguised employment, dependent self-employment, and the gig-economy.

67. World Economic Forum, **The Future of Jobs Report** (2018) pp. 13-14.

68. Which train for a new profession, whether in secondary schools or for adults of all ages, sometimes known as "reskilling".

Page 88

back to page

69. In particular literacy, numeracy and digital skills.

Page 88 [cont.]

back to page

70. The terms "skills", "competencies", and "capabilities" are used interchangeably in the employment discourse, and are often difficult to define accurately. The terms in this audit are used according to context.

Page 92

back to page

71. Vocational Training and Human Resources Development Department, and Government the Institute for Technology and Science Training, are both part of the Labour Branch of the MOL; the Institute for Technology and Science Training trains and certifies technicians and practical engineers.

Page 94

back to page

72. PIAAC (the Programme for the International Assessment of Adult Competencies) is a programme 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. 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 is planned for 2022–2023.

Page 94 [cont.]

back to page

73. Those pursuing academic degrees are usually required need to attain a decent level of English in order to graduate.

Page 95

back to page

74. The Ministry of Education ranks every school according to a nurture index, based on the demographic and socioeconomic background of its students. The index includes the following parameters: level of education of the most educated parent in the family (40%); per capita income level in the family (20%); periphery-level of the school (20%); status as immigrant, specifically from developing countries (20%). The nurture index determined for each school is used to establish the differential allocation of resources for the school, with the objective of improving the economic support to those schools that require more nurturing compared to other schools.

Page 96

back to page

75. The Ministry of Education ranks every school according to a nurture index, based on the demographic and socioeconomic background of its students. The index includes the following parameters: level of education of the most educated parent in the family (40%); per capita income level in the family (20%); periphery-level of the school (20%); status as immigrant, specifically from developing countries (20%). The nurture index determined for each school is used to establish the differential allocation of resources for the school, with the objective of improving the economic support to those schools that require more nurturing compared to other schools.

Page 97

back to page

76. PIAAC data from the OECD **Dashboard on priorities for adult learning.**

Page 100

back to page

77. Such as single-client freelancers, temporary workers, platform workers, part-time workers etc.

Page 111

back to page

78. Indicators are based on OECD or EUROSTAT data, unless otherwise stated. Indicators are presented for the most recent year available in these sources as of June 2021. PISA Data is shown from the 2018 results, unless stated otherwise.

79. https://ec.europa.eu/health/sites/health/files/state/docs/2019_chp_bulgaria_bulgarian.pdf

80. https://www.minfin.bg/bg/1394

Page 114

back to page

81. COUNCIL RECOMMENDATION of 13 July 2018 on the National Reform Program of Bulgaria for 2018 and containing an opinion of the Council on the Convergence Program of Bulgaria for 2018.

Page 120

back to page

82. https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=trng_lfse_01&lang=en

Page 121

back to page

83. https://ec.europa.eu/eurostat/databrowser/view/isoc_sk_dskl_i/default/table?lang=en

Page 126

back to page

84. Indicators are based on OECD or EUROSTAT data, unless otherwise stated. Indicators are presented for the most recent year available in these sources as of June 2021. PIAAC Data is shown from the 2015 survey. PISA Data is shown from the 2018 results, unless stated otherwise.

Page 129

back to page

85. James Manyika, Kevin Sneader (2018). AI, automation, and the future of work: Ten things to solve for. San Francisco, CA: McKinsey Global Institute (MGI). McKinsey also suggested that "through 2030, the time spent using advanced technological skills will increase by 50 percent in the United States and by 41 percent in Europe." (Jacques Bughin et al. (2018). Skill Shift" Automation and the future of the workforce. San Francisco, CA: McKinsey Global Institute (MGI).

Page 130

back to page

86. Conducted on April 8, 2019.

87. Specialized high schools aim to foster skilled technicians in specific sectors of the labour market (there are a total of 463 specialized high schools nationwide).

88. A total of 51 Meister high schools focus on training qualified technicians in new industries, such as media and robotics, rather than helping their students pursue further academic progression.

89. During this audit, the BAI identified the problems of demand-driven type LINC+ projects.

Page 131

back to page

90. The Korean government has launched the LINC+ (Leaders in INdustry-university Cooperation) projects to provide colleges and universities with financial support. The government selects colleges and universities for two project categories: "advanced LINC type" and "demand-driven type." The applicants selected for the "Advanced LINC type" focus on strengthening national competitiveness and scaling up youth employment through close cooperation between universities and industry. The applicants selected for the "demand-driven type" aim to alleviate unemployment and ease labour shortages by providing curricula that reflect the demands of the market.

Page 132

back to page

91. Class interval refers to the subsets into which the data is grouped. It is defined as the difference between the upper-class limit and the lower-class limit.

Page 134

back to page

92. The threshold limit value (TLV) of 735 chemical substances and the periodic measurement of employees' exposure to 190 hazardous chemicals are stipulated in the Occupational Safety and Health Act.

93. Compared to the average level of hazardous substances that occur in industrial companies, the level of iron oxide was 25 times higher (2.122/0.084mg/m3), and the level of manganese was 16 times higher (0.429/0.026mg/m3).

Page 137

back to page

94. SPUs are technically classified as a type of national university (though not stipulated in law, such as the Higher Education Act), and are alloted a budget that provides support for cost of experiments and training designed to foster a competent workforce for specialized fields.

95. According to Article 37 of the Higher Education Act, "The purpose of industrial colleges is to train industrial human resources who will contribute to the development of the State and society by providing an opportunity for higher education to those who intend to undergo continuing education for the research and study of science and arts or expert knowledge or skills required for industrial society."

Page 137 [cont.]

back to page

96. The analysis framework was jointly developed with the Korean Educational Development Institute (KEDI), which was established for comprehensive and scientific researches on educational issues.

97. Condition of education refers to various conditions provided to students to ensure high-quality education such as the number of full-time faculty members, research capacities of the faculty, cost of education per student, record of winning government-funded project, etc.

Page 138

back to page

98. The MoE classifies national universities into Major National Universities (representative national universities in regional areas, especially established and operated in metropolitan cities and provinces), Regional Universities (small and middle-sized regional universities), SPUs (workforce development in specialized fields), and Teacher's Training Colleges.

99. Looking at the 2018 budget for specialized curriculum of the eight SPUs, they all depend heavily on government funds. For the KMOU who has the largest budget, KRW 12.6 billion (92%) out of 13.6 billion is from government funds, and for the SeoulTech, the whole budget of KRW 7.2 billion is from government funds.

Page 139

back to page

100. In education, the term STEAM refers to an integrated approach to learning and teaching across the disciplines of Science, Technology, Engineering, Arts, and Mathematics.

Page 140

back to page

101. Industry-academy cooperation activities consist of onsite training (work at actual sites to strengthen practical capacity), Capstone Design (practical training program allowing students to experience the whole process of planning, design, and manufacturing to cultivate problem solving capacity in an actual work site), contracted departments (operating courses based on the contracts signed between universities and industries with necessary costs paid by the industries), and on-demand curriculum (operating courses upon the demands of industries, with no burden on the industries for necessary costs).

102. PUs might place more importance on securing part-time faculty equipped with practical competency and might need to consider placing more weight on the research capacity of specialized areas. However, this audit used open data for universities that can be applied to all universities and reliable, and compared them with other regional universities and flagship national universities to examine the conditions of education of SPUsץ

103.The MMU and the KMOU show higher education costs per student than other regional universities because the MoE supports operational costs for vessels used for training.

104. In the title of Figure 6, performance of government-funded projects means how many government-funded the SPUs have won in the bid.

03 THEME

Page 141

back to page

105. According to the Korea Standard Industrial Classification (KSIC), manufacturing, construction, science and technical services, and IT industries are the four sectors that are closely related to the engineering sector. As for the transportation and warehousing industry, the KMOU (45.3%) and the MMU (67.7%) that nurture marine engineers displayed a higher employment rate.

Page 142

back to page

106. The former GNTech and the Gyeongsang University were integrated into the Gyeongsang National University on March 1, 2021, while the HKNU submitted the application to the MoE for integration with the Korea National University of Welfare in January 2021.

Page 146

back to page

107. Digital literacy may be defined as the ability to use information and communications technologies to find and create information, solve problems and interact with others in the digital world. According to other definitions, it is an array of capabilities, skills and knowledge needed to participate in a digital environment in the 21st century.

108. van Laar et al., "The Relation Between 21st-Century Skills and Digital Skills: A Systematic Literature Review", **Computers in Human Behavior** 72 (2017), pp. 577 - 588.

109. European Commission, **ICT for work: Digital skills in the workplace** (2017). Similarly, a 2013 analysis estimated that in 2020 digital literacy will be required in 85%-95% of all positions: European Commission, EU Science Hub, **News: Job market fails to unleash ICT potential** (2013) [link].

110. In the United States digital literacy was not required only for dishwashing and food cooking jobs: OECD, **Policy Brief On The Future Of Work - Skills for a Digital World** (2016) (**= Future Of Work**), p. 1; an analysis of tens of millions of online job postings between July 2018 and September 2020: CEDEFOP, Skills-OVATE: **Skills Online Vacancy Analysis Tool for Europe.** [link] – accessed 8.12.2020.

111. **Future of Work**, pp. 1 - 3.

112. Nedelkoska & Quintini, **Automation, skills use and training**, OECD Social, Employment and Migration Working Papers, No. 202 (2018), p. 92

Page 147

back to page

113. See above about the UN Sustainable Development Goals for 2030. Regarding indicators see [link].

114. **New Skills Agenda for Europe**, updated in 2020 [link]. **The European Agenda for Digital Education** [link]. DigComp [link]. **The Digital Skills and Jobs Coalition** [link].

115. OECD, **Skills for a Digital World: 2016 Ministerial Meeting on the Digital Economy -background Report**, p. 18; Czech Republic [link]; Ireland [link].

Page 148

back to page

116. Indicators are based on OECD or EUROSTAT data, unless otherwise stated. Indicators are presented for the most recent year available in these sources as of June 2021. **PISA** Data is shown from the 2018 results, unless stated otherwise.

Page 154

back to page

117. ICT for work: Digital skills in the workplace, Final report, 2017: ISBN 978-92-79-67761-8.

118. European skills and jobs survey (ESJS), Cedefop.

119. Cedefop (2016), "The great divide: Digitalisation and digital skill gaps in the EU workforce", #ESJsurvey Insights, No 9, Thessaloniki: Greece.

Page 155

back to page ↑

120. Curtarelli, Maurizio and Gualtieri, Valentina with Shater Jannati, Maryam and Donlevy, Vicki, ICT for work: Digital skills in the workplace, Final report, 2016, pp. 8 and 95.

Page 156

back to page ↑

121. Results from the publication: OECD (2019), Skills Matter: Additional Results from the Survey of Adult Skills, OECD Skills Studies, OECD Publishing, Paris.

122. See I-DESI 2020: How digital is Europe compared to other major world economies? (Included countries: EU28, Australia, Brazil, Canada, Chile, China, Iceland, Israel, Japan, Mexico, New Zealand, Norway, Republic of Korea, Russia, Serbia, Switzerland, Turkey, United States).

Page 158

back to page ↑

123. See eEurope 2002: Impact and Priorities A communication to the Spring European Council in Stockholm, 23-24 March 2001 (COM(2001) 140 final) or the Ministerial Declaration on 11 June 2006, Riga, Latvia.

124. Council conclusions of 12 May 2009 on a strategic framework for European cooperation in education and training ("ET 2020").

125.Communication from the Commission: Europe 2020 – A strategy for smart, sustainable and inclusive growth; COM(2010) 2020 final.

Page 158 [cont.]

back to page ↑

126. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Taking stock of the Europe 2020 strategy for smart, sustainable and inclusive growth – COM(2014) 130 final.

127. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A Digital Single Market Strategy for Europe, COM(2015) 192 final.

128. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Digitising European Industry - Reaping the full benefits of a Digital Single Market; COM(2016) 180 final.

129.Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A New Skills Agenda for Europe; COM(2016) 381 final and Council Resolution on A New Skills Agenda for an Inclusive and Competitive Europe.

130. Commission Staff Working Document: Council Recommendation on Upskilling Pathways: New Opportunities for Adults Taking stock of implementation measures, SWD(2019) 89 final.

Page 159

back to page ↑

131. See EU Website on DSJC.

132. Coalition's Pledgeviewer.

133. Austria, Cyprus, Denmark, Estonia, Finland, Hungary, Luxembourg, Portugal and the United Kingdom.

Page 160

back to page ↑

134. Article 3 (2)b of Regulation 1304/2013.

Page 161

back to page ↑

135. Proposal for a Regulation of the European Parliament and of the Council amending Regulation (EU) No 1303/2013 as regards exceptional additional resources and implementing arrangements under the Investment for growth and jobs goal to provide assistance for fostering crisis repair in the context of the COVID-19 pandemic and preparing a green, digital and resilient recovery of the economy (REACT-EU), COM(2020) 451 final.

136. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: European Skills Agenda for sustainable competitiveness, social fairness and resilience, COM(2020) 274 final.

137. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank: Annual Sustainable Growth Strategy 2021, COM(2020) 575 final.

Page 161 [cont.]

back to page ↑

138. See Note 11538/20 of the General Secretariat of the Council of 7 October 2020.

139. See Note EUCO 13/20 of 2 October 2020.

Page 162

back to page ↑

140. Proposal for a Regulation of the European Parliament and of the Council on the European Social Fund Plus (ESF+), COM(2018) 382 final.

141. 2019: European Semester: Country Reports, Annex D.

142. Proposal for a Regulation of the European Parliament and of the Council establishing 'Erasmus': the Union programme for education, training, youth and sport and repealing Regulation (EU) No 1288/2013, COM(2018) 367 final.

143. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Digital Education Action Plan 2021-2027 – Resetting education and training for the digital age; COM(2020) 624 final.

144. Council recommendation of 30 October 2020 on A Bridge to Jobs – Reinforcing the Youth Guarantee and replacing the Council Recommendation of 22 April 2013 on establishing a Youth Guarantee (2020/C 372/01).

Page 164

back to page ↑

145. Thus, for example, an understanding of the ethical and legal aspects related to technology is required, including the implications of gathering and disseminating different types of data, in accordance with their level of sensitivity, and awareness of the risks stemming from the digital medium and communication with strangers. Digital ethics is the ability to operate responsibly in an online environment and implement social norms that prevent situations of risk to oneself and to other users. See for example **Digital Skills for Life and Work**, UNESCO (2017), p. 32.

146. The figure is based on components appearing in various official documents. For example, UNESCO built a framework for definition, assessment and measurement of digital literacy: **A Global Framework of Reference on Digital Literacy Skills for Indicator 4.4.2**, UNESCO (2018). 'Computational thinking' is a problem-solving process that includes the ability to shape solutions that will be performed by a human or a computer or a combination of both.

Page 165

back to page ↑

147. UN **Agenda 2030 for Sustainable Development Goals**. Goal 4, target 4.4, indicators 4.4.1 and 4.4.2. Israel adopted the UN General Council resolution number A/RES/70/1 from 25 September 2015 on this matter. See Government decision 4631 (14 July 2019).

148. **New Skills Agenda for Europe** (2016) [link], updated in 2020: **European Skills Agenda**.

149. **Digital Education Action Plan** [link]; see also DigComp [link]; **The Digital Skills and Jobs Coalition** [link].

Page 165 [cont.]

back to page ↑

150. OECD, **Skills for a Digital World: 2016 Ministerial Meeting on the Digital Economy – background Report,** p. 18; Czech Republic [link]; Ireland [link].

151. The survey asked about using the internet in the three months preceding the survey—either on a computer or on a mobile device.

Page 166

back to page ↑

152. The percentage of people who used the computer in the three months preceding the survey; OECD.Stat, "ICT Access and Usage by Households and Individuals" [link] (accessed last: 1 March 2020).

153. OECD.stat, "ICT access and usage by Households and individuals" [link] (last accessed 1 March 2020).

Page 167

back to page ↑

154. The use of the internet by the adult population in Israel (ages 20–74) rose from 74% in 2013 to 89% in 2019. CBS data processed, **Statistical Abstract of Israel 2015**, Table 9.7; **Statistical Abstract of Israel 2020,** Table 17.19.

155. PIAAC (the Programme for the International Assessment of Adult Competencies) is a programme 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

Page 167 [cont.] back to page

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 labour 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 is planned for 2022–2023.

156. PIAAC Data Explorer [link]; as noted, Israel participated in the survey in 2014-2015; the OECD country average, and other countries' scores, relate to all the countries that participated in the survey's first cycle, 2011–2017.

Page 168 back to page

157. PIAAC Data Explorer [link].

Page 169 back to page

158. This refers to the gap between the scores of the 95th percentile and the 5th percentile on the test. The digital gap in Israel 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.

159. The ultra-Orthodox (or "Haredi") Jewish population in Israel is a non-homogeneous religiously-devout group with its own lifestyle and characteristics, who comprise about 12% of Israel's

Page 169 [cont.] back to page

population. Most ultra-Orthodox Jews live in closed communities, their poverty rate is relatively high compared to the general population of the Jewish non-ultra-Orthodox, they tend to use the internet and computers less, their employment rate is lower, and their children generally study less general studies (such as science and math).

160. CBS, **Statistical Abstract of Israel 2020**, Table 17.19. It should be noted that data is based on a survey and not an analysis of digital traces. Other surveys present slightly different data.

Page 170 back to page

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

162. This report defines people with low levels of digital literacy are those who ranked at level 1 or below on the PIAAC "Problem solving in technology-rich environments" test, or who were not tested because they lack basic digital skills: they said that they had no previous experience using a computer; or they failed the most basic digital skills test (such as using a mouse or scrolling), or they chose to take a printed test; or they had technical problems, literacy problems or other personal preferences—test takers whom the OECD concluded to have a lack of digital skills: OECD, **Skills Matter: Further Results from the Survey of Adult Skills** (2016), table A2.6.

163. Those who ranked at levels 2 or 3 on the PIAAC "Problem solving in technology-rich environments" test.

Page 172 back to page

164. 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.

Page 173 back to page

165. 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.

Page 174 back to page

166. 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 time the audit finished, Digital Israel Initiative was transferred to the Ministry of Cyber and Digital Matters.

Page 179 back to page

167. **HiTech Human Capital Report 2019**, Israel Innovation Authority and Start-Up Nation Central.

168. As well as through bringing in skilled foreign workers, a subject not dealt with in this report.

169. The Ultra-Orthodox (or "Haredi") Jews in Israel are a non-homogeneous religiously-devout group with its own lifestyle and characteristics, who comprise about 12% of the State's population. Most

Page 179 [cont.] back to page

Ultra-Orthodox Jews live in closed communities, their poverty rate is relatively high compared to the general population, they use the internet and computers less, their employment rate is lower, and their children attend schools dedicated to their society and generally study less general studies (such as science and mathematics).

Page 181 back to page

170. Academic HiTech subjects: Electrical engineering, electronic engineering, computer engineering, information systems engineering, and computer science. In some HiTech-oriented higher education faculties, a secondary school matriculation certificate that includes technological-scientific subjects is a prerequisite for applying.

171. Those whose matriculation certificate shows that they have completed five units of computer science are singled out by the IDF as candidates for service in its technological units.

172. The Ministry of Education ranks every school according to a nurture index, based on the demographic and socioeconomic background of its students. The index includes the following parameters: level of education of the most educated parent in the family (40%); per capita income level in the family (20%); periphery-level of the school (20%); status as immigrant, specifically from developing countries (20%). The nurture index determined for each school is used to establish the differential allocation of resources for the school, with the objective of improving the economic support to those schools that require more nurturing compared to other schools.

Page 182 back to page

173. The State education system is operated by the State and serves its residents, and most Israeli schools are part of it. The State education system includes these sectors: State-Jewish education (non-religious), Orthodox State-Jewish education (religious, non-ultra-Orthodox), ultra-Orthodox State-Jewish education, and Arab education. Most ultra-Orthodox students study in designated schools, owned by private organizations.

Page 184 back to page

174. The CHE is a statutory corporation, established by the Law of Higher Education, 1958, whose mission is to delineate the policies of the State's higher education system. The Planning and Budgeting Committee serves as a subcommittee of the CHE in matters of planning and budgeting the higher education system, and implements multiyear planning for the entire higher education system.

175. The IDF's Applications and Technology Department in the Ministry of Defense, the CHE, the Israel Innovation Authority, the Ministry of Labour, the Ministry of Science, Technology and Space, and the Government ICT Authority.

Page 186 back to page

176. The Israel Innovation Authority was erected according to a 2014 Government resolution, for the purpose of promoting, supporting and assisting technological innovation in industries. The Labour Branch in the Ministry of Labour, Social Affairs and Social Services (and since 2021 - in the Ministry of Economy and Industry), operates employment programs, various vocational trainings and employment guidance centers for designated populations.

Page 189 back to page

177. The "Virtual High School" allows students from upper secondary schools across Israel to study online such subjects as mathematics and physics at the five-unit level.

04 THEME

Page 194

back to page

178. OECD data: GDP per hour worked [link].

Page 196

back to page

179. Indicators are based on OECD or EUROSTAT data, unless otherwise stated. Indicators are presented for the most recent year available in these sources as of June 2021. **PIAAC** Data is shown from the 2015 survey. **PISA** Data is shown from the 2018 results, unless stated otherwise.

Page 199

back to page

180. See the 2019 Document of Economy and Finance.

Page 200

back to page

181. Figures refer to the period January-March 2021. See the 2021 Public Finance Coordinationd Report of the Corte dei conti.

Page 206

back to page

182. ANPAL is the public agency in charge of coordinating the network of public services for job seekers. Public employment services offices are part of this network even if their operating management and organization is entrusted to the regional governments.

Page 212

back to page

183. Indicators are based on OECD or EUROSTAT data, unless otherwise stated. Indicators are presented for the most recent year available in these sources as of June 2021. PISA Data is shown from the 2018 results, unless stated otherwise.

Page 216

back to page

184. Data source: Employment Agency of RNM

Page 219

back to page

185. Data source: State Statistical Office of RNM

Page 221

back to page

186. Migration Policy Resolution 2015-2020, Employment and Social Policy Reform Program 2020, Revised Employment and Social Policy Reform Program 2022

187. Excerpt from the Draft Minutes from the Government session no. 41-7756 / 1 dated 29.10.2013 for adoption of the National Strategy

Page 223

back to page

188. Ministry of Labour and Social Policy, Ministry of Education and Science, Ministry of Economy, Ministry of Health

INSIGHTS

Page 240

back to page

189. (2019) p. 3. The international exchange of experiences between SAIs was pronounced desirable already in 1977, in sec. 15 of the Lima Declaration (INTOSAI-P 1).

Office of the State Comptroller and Ombudsman of Israel
2 Mevaker Hamedina st., POB 1081, Jerusalem 9101001, Israel
Tel. +972-2-666-5000
mevaker@mevaker.gov.il | mevaker.gov.il