



Digital technologies in career guidance for youth: opportunities and challenges

Around the world, digital technologies are increasingly being used to deliver school career guidance. Career guidance systems have invested heavily in digital technologies and there is good reason to believe that they will enhance guidance by making it more effective, efficient, and equitable. However, this cannot be taken for granted. This policy perspective explores the role of digital technologies in guidance provision, considering both likely benefits and key concerns requiring attention. It focuses on the following questions:

- How are digital technologies being used in career guidance provision for children and young people?
- What are the opportunities presented by using technologies in such career guidance?
- What are considerations that policy makers should give when developing digital solutions for youth career guidance?

The importance of career guidance for young people

Young people are entering the labour market more highly educated and with greater ambition than ever before, but in many countries they still struggle to find good employment (Mann, Denis and Percy, 2020^[1]). Societies turn to career guidance systems to help students better visualise, plan and progress towards their career ambitions, allowing them to become better situated to accumulate and activate knowledge and skills in the labour market. Reviews of quantitative data shows that countries are right to do so. Young people who engage in forms of career development linked particularly to how they explore, experience and think about their futures commonly go on to enjoy better transitions into the labour market than comparable peers who did not so engage (Covacevich et al., 2021^[2]; Mann, Denis and Percy, 2020^[1]).

Young people's need for greater guidance

Career guidance is widely recognised as essential aspect of young people's education (Cedefop, 2021^[3]). However, the OECD Programme for International Student Assessment (PISA) shows that the level of career development undertaken by secondary school students is very often insufficient. PISA

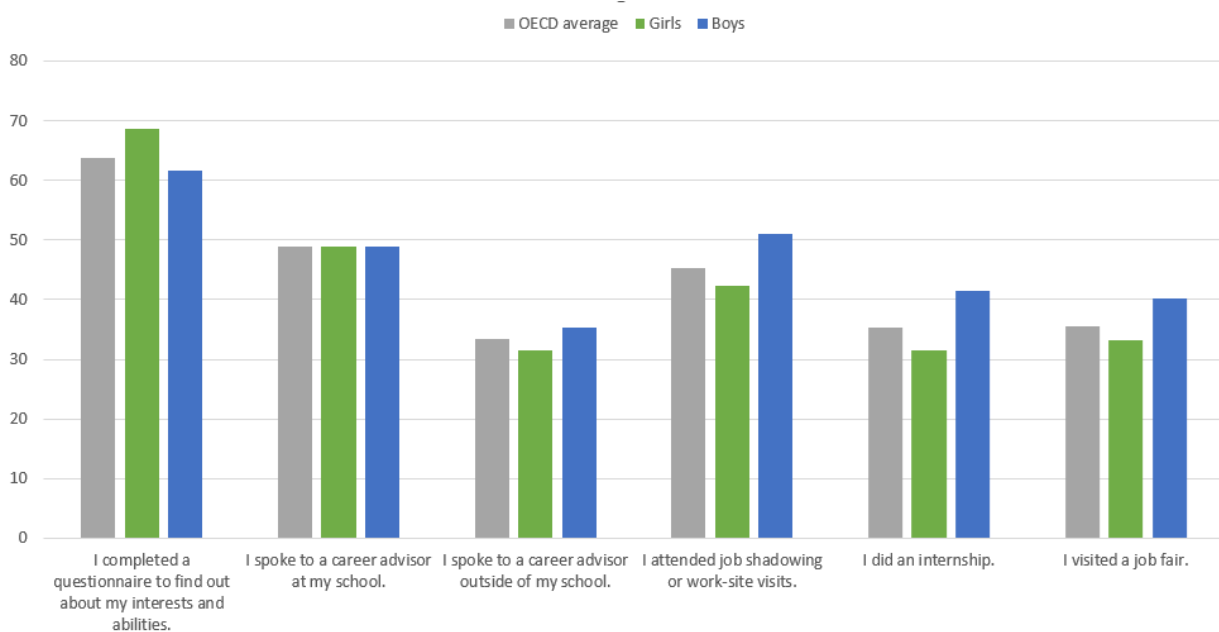
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2022 reveals high levels of career uncertainty and confusion among young people in most OECD countries. The proportion of students from OECD countries who can be classified as uncertain in their career plans rose from 25% in PISA 2018 to 39% in PISA 2022 (OECD, 2024^[4]). The proportion of students who demonstrate confusion over the level of education typically needed to achieve their plans is also substantial. On average, 21% of students across the OECD who expressed an occupational expectation in PISA 2022 can be considered misaligned in their career plans; in that they expect to work in a field typically requiring a higher education qualification, but do not expect to pursue tertiary education (OECD, 2024^[5]). Multiple longitudinal studies find evidence of labour market penalties in relation to such teenage career uncertainty and misalignment (Covacevich et al., 2021^[2]; OECD, 2024^[4]; ^[5]). Further concerns arise about the concentration of career ambitions. Across the OECD, one half of girls and boys with a clear occupational expectation anticipate working in a job that is among the most popular 10 choices of their peers, by gender and country. Moreover, two-thirds now expect to work in a professional occupation such as doctor, lawyer, engineer or teacher, a sector of the labour force which typically employs fewer than a quarter of workers (Mann, Diaz and Zapata Posada, 2024^[6]). Career aspirations are also highly gendered from an early age (OECD, 2023^[7]) and linked to the social and migrant backgrounds of students (Musset and Mytna Kurekova, 2018^[8]; OECD, 2024^[9]).

PISA 2022 shows moreover that relatively few students by the age of 15 have participated in important forms of career exploration and reflection which can be statistically linked both to lower levels of career uncertainty and misalignment and better ultimate employment outcomes (Covacevich et al., 2021^[2]; Mann, Diaz and Zapata Posada, 2024^[6]). **Figure 1** shows that on average across OECD countries in 2022 less than 50% of students had spoken with a career advisor at school (49%), participated in job shadowing or work-site visits (45%), undertaken an internship (35%), or visited a job fair (35%).

Figure 1. Participation in career guidance activities by gender, PISA 2022

Students engaged in activity in on or more occasions, OECD average



Source: OECD PISA 2022 database

Against this background, both education systems and individual students are increasingly using digital resources to enhance access to career information and to gain career-related experiences. In the

PISA 2022 assessment, large representative samples of students in more than 70 countries were asked about their engagement in nine different forms of career development. The most common activities in which students report engagement are digital.

National variation in use of the Internet to support career development

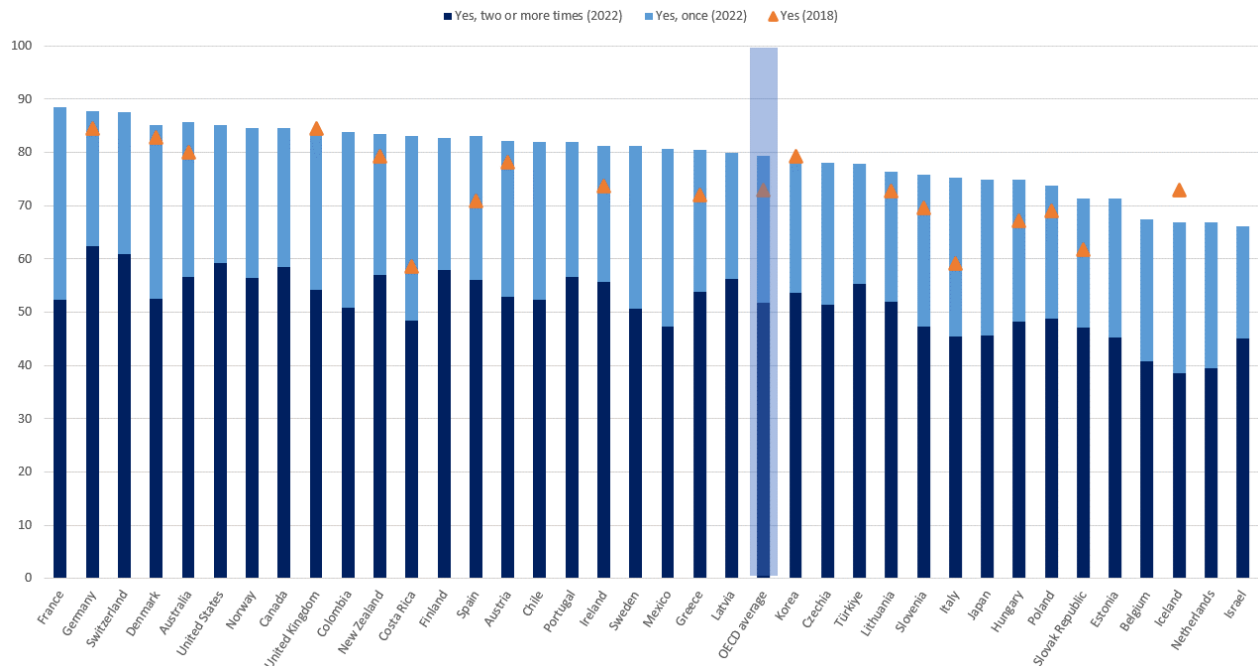
PISA highlights that an increasing number of school students are using digital resources to find out information about careers. Since 2012, PISA has collected data on students' use of the Internet to research careers and education/training programmes, although initially only a small number of countries provided data. The number grew when opportunity was presented again to opt into relevant questions in 2018. In PISA 2022, all OECD countries (with the exception of Luxembourg) along with many non-OECD countries asked their students about their use of the Internet for career development. Over the three surveys, two key questions have been asked in the same format. Students are asked to agree or disagree with two statements: "I researched the Internet for information about careers" and "I researched the Internet for information about post-secondary education and training programmes". In 2022, 15-year-old students were provided with three response options a) No b) Yes, once or c) Yes, two or more times. In earlier surveys, students simply answered Yes or No.

Researching careers

In 2022, an average of 79% of 15-year-old students across OECD countries agreed that they had used the Internet to find out information about careers (see **Figure 2**). There is noticeable variation between countries. Whereas more than 85% of students in France, Germany, Switzerland, Denmark, Australia and the United States reported going online to investigate careers, this figure was less than 70% in Belgium, Iceland, the Netherlands and Israel. Between 2018 and 2022, on average across OECD countries with information available for both years, the percentage of students making use of the Internet to gather information about careers grew from 73% to 80%. In only three of the 18 countries where data is available did usage levels fall between 2018 and 2022 (Iceland dropped 6 ppt, Korea 1 ppt and the United Kingdom 0.7 ppt). Between 2012 and 2022, data are available for fourteen primarily European countries. The comparison shows that the average use of internet to research careers in these countries grew from 74% in 2012 to 80% in 2022 (Sweet, Nissinen and Vuorinen, 2014^[10]).

Figure 2. Students who used the internet to research information about careers

Student responses to question “I researched the internet for information about careers.” PISA 2022 & 2018



Note: Countries and economies are ranked in descending order of percentage of a yes response for PISA 2022 (yes, once or yes, two or more times)

OECD average for PISA 2018 calculated for the countries and economies that had students respond to this question.

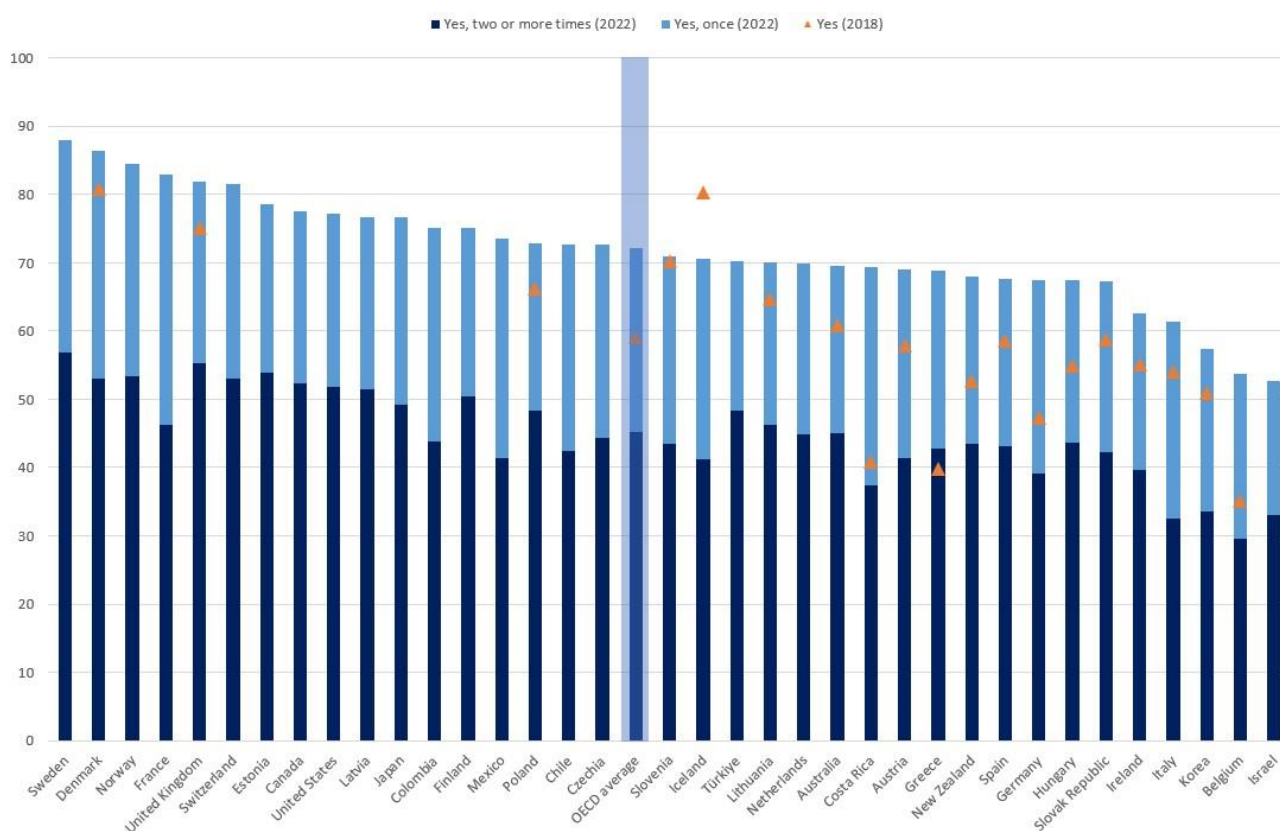
Source: OECD, PISA 2022 Database and PISA 2018 Database

Researching post-secondary education programmes

PISA 2022 also shows that 15-year-old students are also actively going online to investigate future education pathways. On average across OECD countries, 72% of students used the Internet to search for information about programmes available at upper secondary education or higher: 45% of students two or more times and 27% on one occasion (**Figure 3**). There are again large national variations with over 80% of students in Sweden, Denmark, Norway, France, the United Kingdom and Switzerland using the Internet for this purpose, while less than 60% of students did so in Korea, Belgium and Israel. Between 2018 and 2022, the average proportion of students conducting online research about future education programmes increased by 13 percentage points across countries for which data are available. Among these countries, all but one, Iceland, saw an increase in usage levels. Between 2012 and 2022, data for 14 OECD countries show that the average percentage of students reporting researching future education programmes online grew from 56% to 70%.

Figure 3. Students who used the internet to research information about post-secondary courses

Student responses to “I researched the internet for information about ISCED 3 – 7 programmes”, PISA 2022 & 2018



Note: Countries and economies are ranked in descending order of percentage of a yes response for PISA 2022 (yes, once or yes, two or more times). OECD average for PISA 2018 calculated for the countries and economies that had students respond to this question.

ISCED is the International Standard Classification of Education so ISCED 3-7 responds to programmes after secondary education. The question posed to students depends on their country, for example, students in the United States were given the wording “I searched the Internet for information about colleges, universities or technical colleges”

Source: OECD, PISA 2022 Database and PISA 2018 Database

Conceptualising digital technologies in career guidance: two approaches

Digital technologies have been widely accepted in education and used within the field of career guidance for many years (Fowkes and McWhirter, 2007^[11]). Kettunen et al. (2020^[12]) note that the terminology for such provision has changed over time including ‘computer-assisted guidance or counselling’, ‘Internet-based guidance or counselling’, ‘virtual guidance’, ‘e-guidance’, ‘distance guidance’, ‘Information and Communication Technologies (ICT) career service’ and ‘online practice’. Initially, computer-assisted career guidance systems allowed users to search through information about occupations and educational provision. As technological capabilities advanced, the sophistication of applications within career guidance also expanded to enable distance counselling, guidance surveys and employer engagement (Bimrose, Kettunen and Goddard, 2014^[13]). With the advancements in Artificial Intelligence (AI), the further potential for transformation in career guidance is substantial (Westman et al., 2021^[14]). Westman and Kettunen provide a helpful framework for conceptualising the maturity of digital resources as they impact on the delivery of career guidance from a practitioner perspective (Westman et al., 2021^[14]).

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At the first level, *technology-informed practice* involves using digital tools to *enhance traditional face-to-face* activities. For example, an online questionnaire can inform a counsellor or student during a face-to-face session, or a portal can be used to find a work-experience position. Here, technology serves as a support mechanism for existing career guidance activities.

The second level, *technology-integrated practice* incorporates digital resources as *essential components within career guidance* for young people. This requires the development of high-quality, accessible resources for users. Such systems include professional development and training for careers counsellors, development of online systems that include up-to-date labour market information from trusted sources and the ability for users to develop resources and skills such as CVs or learning interview techniques through online tools.

Finally, *technology-transformed practice* represents a system where *new career guidance activities are developed and delivered through digital technologies*. This includes virtual work experiences, virtual reality simulations and online career talks that connect people in work with schools. Such provision may be delivered wholly online or in hybrid formats which combine virtual and face-to-face provision.

It is also possible to make sense of the role of digital technologies in guidance from the perspectives of empirical evidence related to career development. As noted, longitudinal analyses notably identify clustered forms of teenage career development that can be associated with better employment outcomes for youth (Covacevich et al., 2021^[2]). Students can be helped through use of the technologies to explore, experience and think/reflect about their career exploration. School and education systems also draw on these tools to help manage guidance provision. Such a model informs the organisation of the OECD Observatory on Digital technologies in Career guidance for Youth (OECD, 2024^[15]).

Table 1. Four forms of guidance provision

Explore	Accessing information related to work and progression pathways into it, e.g. labour market information, tertiary programmes and their requirements, career talks, workplace visits.
Experience	Gaining skills and experience relevant to post-secondary transitions, e.g. work placements, work simulations, CV creation.
Think	Reflecting on career plans, e.g. career questionnaires, engagement with guidance counsellors.
Manage	Enabling guidance delivery, e.g. collecting and processing data on student engagement, connecting with employers and people in work.

Source: (Mann, Denis and Percy, 2020^[1])

The COVID-19 pandemic accelerated the use of technology in career guidance activities. Data from the joint international survey of the Inter-Agency Working Group on Work-Based Learning (Cedefop; European Commission; ETF; ICCDPP; ILO; OECD; UNESCO, 2020^[16]) indicates a clear shift to the use of digital technologies in the delivery of guidance activities from the early stages of the COVID-19 pandemic. Over half of the 963 participants (47% practitioners and 30% policy officials) in 93 countries/economies reported that career counselling, individual information and advice, career education and training and coaching and mentoring had been adapted during shutdowns. 40% of respondents reported that video counselling had become common during the pandemic. More recently, the OECD Digital Education Outlook 2023 found that 79% of 29 countries/jurisdictions within the study reported providing study/career guidance information through digital platforms, with ten using advanced rule-based algorithms in their study/career guidance systems (OECD, 2023^[17]).

How digital technologies can be expected to enhance school career guidance

While very little digital provision has been evaluated even to the minimum standards of social science research, there is good reason to believe that new modes of delivery have the capacity to bring benefits to students. OECD analysis underscores the potential of digital technologies to enhance education provision in general, notably in terms of offering greater personalisation of learning, improved teaching quality, enhanced efficiency in delivery and greater inclusion and equity (OECD, 2023^[17]). These approaches align closely with the potential of digital technologies to enhance the effectiveness, efficiency and equity with which career development interventions are made available to students and managed by their schools.

The OECD Observatory on Digital Technology in Career Guidance for Youth

The [OECD Observatory on the use of Digital technologies in Career guidance for Youth](#) (ODiCY) is an open-access repository of case studies of digital resources that are currently being used within primary and secondary school contexts internationally. ODiCY provides insights into the current application of technologies in school career guidance. The resources are categorised by the forms of guidance that the resources provide and by the types of technologies used. Digital resources are categorised within four categories. Three relate to beneficial forms of student career development (exploring, experiencing and thinking about career progression) (Covacevich et al., 2021^[2]), while a fourth relates to the management of career guidance systems. ODiCY collects case studies from resource developers and users in order to describe their functions and intentions to make career guidance more effective, efficient and/or equitable. Submitters are asked if their resource is backed by research, funded by a government, externally evaluated and/or recognised by peers. If not government designed or funded, schools are approached to endorse resources to confirm that they are valued.

As of September 2024, 52 case studies related to career guidance services in 16 countries were available through ODiCY. Technologies currently used include video streaming (52%), social media (20%), gaming (17%), artificial intelligence (17%) and virtual reality (7%) with many resources employing multiple technologies. Extensively tagged, ODiCY offers a growing collection of practical examples that can be drawn upon to illustrate and compare how digital technologies are being used within guidance provision.

Source: (OECD, 2024^[15])

More effective career guidance

Effective career guidance is adapted to the individual needs of a student as they progress through education and become more open to career planning (Gati and Asulin-Peretz, 2011^[18]; Hirschi, 2011^[19]). Career development is a reflective process that a student goes through to gain insights into opportunities that exist within the world of work. This process is based on students' understanding of their own emerging interests, capacities, and constraints. Longitudinal analyses in multiple countries provide insights into the types of guidance provision that can be most confidently expected to link with better ultimate employment outcomes (Covacevich et al., 2021^[2]). For career guidance to be considered fully effective, interventions need to be provided at the appropriate time in the most relevant formats to assist a young person in making personal decisions that are helpful to the optimisation of career visualisation, planning and preparation for transitions into fulfilling employment and full participation in society. Moving away from a 'one-size-fits-all' approach towards a more personalised approach moreover is also central to improving equity in career guidance (OECD, 2024^[9]). Consequently, advantages are apparent when access to career development activities becomes more flexibly available to students and more targeted around their needs.

Career exploration: enabling increasingly personalised access to information about the labour market

One of the early uses of digital technologies in guidance was to improve student access to labour market information. Over recent years, this function has become increasingly sophisticated. In many countries, students now have free access to information on average earnings, patterns of employment demand and the typical entry qualification requirements of hundreds of different jobs. In this, digital provision has both broadened student access to career-related information, but also provided them with new opportunities to engage with it intensely in and outside of the classroom. Increasingly such data are contextualised in ways that help students make deeper sense of the information by connecting with the reality of working lives. The [iCould](#) programme (United Kingdom) for example presents such labour market information alongside videos of workers in the field talking about their working lives. Resources such as [Careers Portal](#) (Ireland) link labour market information to live local advertisements of relevant jobs.

It is one thing however for the data to be available and another for it to be readily accessed by students. Galliot (2017^[20]) found from a survey of 706 students aged 15-18 in 12 Australian secondary schools that a majority of students were unaware of the online career guidance services available with awareness varying considerably by gender. The study found no significant relationship between exposure to online career exploration websites and the career certainty of young people. By contrast, a recent study by Goller, Graf and Wolter (2024^[21]) made use of data from a public Swiss online apprenticeship platform which allows young people to search for apprenticeship vacancies in their preferred region and profession. The study compared levels of engagement on the platform from students (typically aged 14-16) living in the vicinity of 34 career fairs (some of which were held in-person while others were fully online) held across Switzerland during the week before and after a career fair was held. While evidence of a 4% increase in platform activity was identified in relation to the provision of 29 in-person career fairs, a 17% increase could be related to the delivery of the five virtual fairs.

Beyond enabling access to resources in a wider range of formats, digital technologies increasingly adapt to student interests in response to their specific concerns and priorities. Many digital tools are now available that take students through interactive activities to narrow down their career interests before directing them to relevant labour market information. In France, [JobDD](#) takes students through an online, automated quiz to explore career interests in light of the UN Sustainable Development Goals before presenting students with examples of related jobs alongside relevant labour market information. In Australia, [BECOME Education](#) is a resource aimed at children around 10 years-old and over that includes teacher-led lessons where students explore their motivations, interests and assumptions about

their future careers. Students are asked to fill in information about themselves identifying jobs that are linked to their individual interests. The application and related lessons aim to expand students understanding of the world of work, to see which jobs are linked to things they like and to start conversations with teachers and career counsellors about their futures of work.

Most recently, AI-powered chatbots like [CiCi](#) (United Kingdom) enable students to engage with a virtual tool which draws upon wide data sources to provide responses to a broad range of potential student questions. Conversing with a chatbot in a more natural form of communication, students respond to prompts to articulate their interests, leading to the presentation of relevant labour market information. The large language model (LLM) utilised in CiCi is trained on specific career related data and the chatbot uses machine learning to collate data analytics to align service provision with the searches that users are making. CiCi collates student information to enable a personalised handover to a real life careers counsellor at the end of the discussion. In a further use of AI, [Singularity Experts](#) (Spain) analyses individual student profiles across 50 different dimensions, matching individuals with potential careers in growing sectors of the labour market. Career counsellors can then work with students to talk about their results and further guide them. In these ways, students (and their advisors) can interact with data sources in new ways, without the need for specialist training (Romito, Gonçalves and De Feo, 2020^[22]).

Engaging directly with people in work to explore careers

One of the most popular uses of digital technologies in career guidance is to provide access to information about the labour market by allowing students to engage directly with people in work. Such interactions conducted in-person are strongly associated with better ultimate employment outcomes for youth (OECD, 2023^[23]; 2021^[24]). Digital technologies are used to make it easier for schools and students to connect directly with workplace volunteers. Through video streaming, schools can connect with volunteers who do not live in their local area, or who may not even live in the same country. Resources such as [Inspiring the Future](#) (United Kingdom) and its sister project, [Primary Futures](#) (United Kingdom), [JobIRL](#) (France) and [Proch'Orientation](#) (France) allow schools to connect directly with workplace volunteers. Through these platforms volunteers register online and make their details available to schools through searchable databases. Schools can target volunteers who they feel will provide the most effective support to their students. In the case of [Inspiring the Future](#), the volunteer list can be filtered by gender, occupation, education and training routes (including apprenticeships), ethnic background and disability as well as types of career guidance activity they would be willing to consider supporting. While volunteers identified through these resources commonly visit schools in-person, they also often participate in online career talks. In a similar way, in the United States, [CareerVillage](#) effectively crowdsources career advice. Through the platform, students ask questions about future careers to volunteers who work in those careers. An AI algorithm matches student questions with the appropriate potential respondents. In such ways, schools and students have potential to access information from the world of work that is more closely tied to student interests.

A review of ODICY practice examples reveals considerable variation with regard to the use of digital tools to enable student access to career information from workplace volunteers (see the summary in **Table 2**). Career talks can be live or recorded, passive or interactive (through either onscreen presenters or student/teacher questioning), filmed in a workplace or straight to camera. Some are edited and include soundtracks. Some are designed for viewing through virtual reality headsets, others are designed to support follow-up activities. Videos vary in length between 1 minute and 1 hour. In the case of [Tiggbee](#) (United States), after watching a pre-recorded video with a volunteer, students generate questions which are sent to the speaker who records a new video answering those questions for viewing one week later. Such resources are popular forms of enhancing career development: [icould](#) (United Kingdom) for

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example is a repository with more than 1 000 videos of people describing their jobs which have been downloaded on more than one million occasions.

To date, research into delivery of career talks online has been severely limited. In one study, Percy and Amegah (2021^[25]) surveyed 182 primary school teachers and 4 335 primary school students in the United Kingdom to explore their perspectives on both online and face-to-face career talks. The study found a strong belief among teachers that face-to-face provision was more impactful on students. However, the children themselves reported that the impact of the two formats on their career thinking was very similar (Percy and Amegah, 2021^[25]). Considerable opportunity exists for empirical reviews of such online provision in the context of what is known about more effective means of face-to-face delivery (OECD, 2023^[23]). Key questions for example revolve around the extent to which students gain access to larger numbers of career talks and whether speakers are felt to be authentic and trustworthy so optimising student capacity for learning new and useful information (Mann, Denis and Percy, 2020^[11]).

Table 2. Features of online career talks

Selection of online resources that offer career talks via digital means on ODICY

Resource	Country	Duration	Format	Age of audience
Amazon Class Chats	France, Germany, India, United Kingdom, United States	15 minutes	Live video streaming Linked to prepared lesson Q&A moderated by teacher	Primary (ages under 12) Lower-secondary (ages 12 – 15) Upper-secondary (ages 16 – 18)
Empresas que Inspiran (Inspiring Companies)	Spain	10 minutes	Pre-recorded videos Employees explaining their career pathway Searchable video library	Lower-secondary (ages 12 – 15) Upper-secondary (ages 16 – 18)
Grand Déclic	Canada	5 minutes	Pre-recorded videos Moderated by career counsellors Searchable video library	Lower-secondary (ages 12 – 15) Upper-secondary (ages 16 – 18)
Icould	United Kingdom	3 – 4 minutes	Pre-recorded videos Employees speak straight to camera Searchable video library	Lower-secondary (ages 12 – 15) Upper-secondary (ages 16 – 18)
Les Métiers en direct	France	10 – 15 minutes	Live video streaming Q&A via chat function Organised session in the school	Lower-secondary (ages 12 – 15) Upper-secondary (ages 16 – 18)
Proch'Orientation	France	2 – 10 minutes	Pre-recorded videos Employees in their place of work Searchable video library	Lower-secondary (ages 12 – 15) Upper-secondary (ages 16 – 18)
See it, Be it	United Kingdom	2 minutes	Pre-recorded videos Employees in their place of work Searchable video library Provided lesson structures around the videos	Lower-secondary (ages 12 – 15) Upper-secondary (ages 16 – 18)
Spark Resources	United Kingdom	1 – 5 minutes	Pre-recorded videos Linked to curriculum and designed to be viewed in career-related classes Searchable video library	Primary (ages under 12) Lower-secondary (ages 12 – 15)
Speakers for Schools	United Kingdom	45 – 60 minutes	Live video broadcasts (which are also recorded for later viewing) Moderated Q&A Searchable video library	Lower-secondary (ages 12 – 15) Upper-secondary (ages 16 – 18)
Tiggbee	United States	5 minutes	Pre-recorded videos Employees in their place of work Questions while watching Response videos released later	Primary (ages under 12) Lower-secondary (ages 12 – 15) Upper-secondary (ages 16 – 18)

Source: (OECD, 2024^[15])

Career experience: Increasing access to work placements and simulations

Effective guidance goes beyond career exploration to allow students to gain first-hand experience of the working world (OECD, 2021^[24]). Digital technologies have capacity to increase access to work placements. In many countries, secondary school students are expected to undertake a placement lasting one to two weeks. Access to placements that align with student career interests, typically sourced by students and their parents, can be challenging (Mann, Denis and Percy, 2020^[11]). One potential solution to the difficulty of identifying and securing work placements of interest lies in the creation of searchable online databases which include details of the placement on offer and application processes. Examples of such a resource include [Proch'Orientation](#) (France) and [Grand Déclic](#) (Canada).

In some countries, students now have opportunity to participate in virtual work placements which can be expected to broaden choice for students. Two models offer a comparison of how such placements can be delivered online. [Virtual TET](#) (Finland) allows two weeks of compulsory work experience to be completed online. Launched up in 2020 in response to the COVID-19 pandemic, Virtual TET uses simple technology like video streaming to allow students to link up with employers across Finland. The model used by [Speakers for Schools: Work Experience Programme](#) (United Kingdom) allows students to choose from in-person or virtual work experience. The virtual experience normally involves a number of short interactive sessions that allow students to have a discussion with an employer and then complete and submit short tasks. Possible activities also include virtual tours of workplace, interview skills workshops or creative tasks.

Virtual work placements provide opportunities to engage with industries and roles that are difficult to access in-person and work simulations are designed to offer a similar experience (Makransky, Petersen and Klingenberg, 2020^[26]). For example, [Jexplore](#) (France) and [Virtual Reality Career Modules](#) (Canada, United States) both offer work simulations to students using virtual reality headsets. The Career Modules include virtual experiences in jobs like auto mechanics, carpentry, welding, hydroponics, and genetics. The experiences allow students to complete tasks and explore the virtual workspace often in fields where health and safety requirements make in-person placements difficult or impossible. Modules that expose students to working with heavy machinery make use of the same digital tools that are used to train workers in the field.

While digital technologies have considerable capacity to enhance the personalisation of career development by broadening access to different forms of occupational insight, to date few evaluations have assessed the effectiveness of these approaches compared to face-to-face provision. The advantages and disadvantages of different digital designs also remain very largely unexplored. While considerable evidence is available on student perceptions of face-to-face encounters with people in work in relation to their career development (OECD, 2021^[24]), it remains unknown how and whether these benefits apply similarly in digital provision.

Enhancing efficiency of career guidance

It is to be expected that the greater adoption of digital tools will increase the efficiency of guidance systems in two important ways. First, online information availability and the automation of key guidance functions through digital tools can free up the time of guidance counsellors to work more closely with individual students. Such resources can enable the easier and cheaper management of guidance provision. Second, improved labour market signalling through digital tools can help students better understand the diversity of labour market opportunities. With barriers to information and engagement reducing, it can be imagined that employers are becoming better able to communicate now to students about job opportunities and how best to prepare for them than was the case a generation ago. Through

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better signalling, young people can be expected to undertake shorter, more efficient transitions into fulfilling employment.

Freeing up the time of guidance counsellors

From the 1990s onwards, education systems have looked to digital technologies to improve the efficiency of key aspects of guidance provision. Online tools have the capacity to reduce the time and costs for schools in connecting with employers and people in work well placed to enhance career guidance provision. They also enable students to access personalised labour market information. Of particular importance is the development of national career portals such as [Utdanning](#) (Norway) or [Careers Portal](#) (Ireland) which bring together information and resources on post-secondary education, training and work opportunities often alongside self-assessment tools that enable career reflection.

Schools also make use of online technologies to engage with parents, sharing career information and guidance and the results of student assessments (see for example [Mapa Karier](#) [Poland] and [BEYOND](#), [Australia]). Career development is an iterative process which takes place over the duration of primary and secondary education. Resources like [MyBlueprint](#) provide students with online portfolios to collate and organise forms of career development within a user space that also allows them to explore post-secondary educational and training opportunities and build CVs in an iterative way.

One of the most popular uses of digital technologies in career guidance are self-assessment questionnaires designed to help students better understand their own preferences and interests and to connect these with potential occupations. Resources like the [C-Game](#) (Czechia) and [Choices Match](#) (New Zealand) make use of Holland's RIASEC model of vocational exploration to identify psychological predispositions that may make for better matches in the labour market. In a pre-digital age, student career interest questionnaires were assessed by hand, processes that are now automated making results immediately available without need for further human intervention. Recent technological advances are furthering this process. Tools like [CiCi](#) (United Kingdom) enable personalised journeys through employment opportunities and post-secondary education and training in ways which organise student information to allow a hand-over to a human careers advisor. Online adaptive career questionnaires typically ask students about their strengths, interests and dislikes and then offer information about potential careers that might match that profile. Adaptive questionnaires generate questions for students that are linked to their previous responses. This means that a user will respond (perhaps saying they would like a job working with people) and the questionnaire would then be able to focus more on those types of jobs rather than asking every user the same question. Adaptive questionnaires can be set up to be more open (allowing more initial responses before going deeper into a specific area) or more tightly focused. This has the potential benefit of increasing efficiency of career questionnaires both for the user and the counsellor. Looking ahead, opportunity exists for digital tools to infer individual students' strengths and weaknesses based on education system databases, including academic performance and extra-curricular activities, to provide recommendations based on a more complete and personalised picture of the young person (OECD, 2023^[17]).

Box 1. How the Careers Portal, Ireland collates career information and resources

[Careers Portal](#) (Ireland) is a digital resource which has been designed with practitioners. It allows users to review 33 employment sectors, making use of video material and career interviews to explore related occupations, associated programmes and skills demand. Current job vacancies in each sector are listed daily. The site profiles the typical tasks, skills required, salary information and entry routes for over 1000 jobs within an occupational database. It also includes employer profiles, explaining procedures for recruitment, internships and work experience opportunities. Employee videos and interviews are presented alongside links to current vacancies available. These supplement hundreds of jobholder interviews with people employed in Ireland who explain the choices they have made in their careers, the education they received, their current job, what it involves and their advice to others interested in this area.

Students can use the site to help with subject choice through lower and upper secondary education, with the career choices made by hundreds of current employees presented alongside the relevant subjects. Moreover, students can apply for work experience placements advertised by employers on a searchable database alongside a range of related resources for learners, teachers, parents and employers. In addition, users can find courses that match their interests and aspirations on a searchable database of education and training programmes at upper secondary and tertiary level alongside the entry grade requirements and signposting alternative progression routes available. Users can find details of available Jobs/Current Vacancies, apprenticeships and up-to-date labour market statistics across sectors and occupations, indicating where jobs are currently in demand or expected to be in the future.

The site provides resources for parents/guardians to support students in making informed career and post-secondary decisions and guidance professionals who have access to a range of resources and tools that support the delivery of guidance, along with notices for upcoming CPD training and guidance, and related news and events available nationally. CareersPortal.ie includes materials for use by practitioners in secondary schools. Students are encouraged to create their own online portfolio through the site to assist in planning and managing their career development. This includes access to a range of self-assessment tools, enabling users to find out how their interests, personality and skills can connect with different courses and careers. A personalised eight-page Career Report, which includes job and course matching, can be generated, and printed. Students can also create shortlists of courses and occupations which are of interest to them and store them in their digital portfolio for further exploration.

Source: https://www.oecd.org/en/publications/observatory-on-digital-technologies-in-career-guidance-for-youth-odicy_e098122e-en/careers-portal-ireland_dcb2c6da-en.html

One important means of improving the efficiency of provision is to increase access to information which will allow schools to benchmark their practice against peer institutions. In Spain, schools enter key data against shared benchmarks to compare provision across a community of secondary schools through the [Xcellence](#) programme, generating a report which highlights strengths and areas for improvement, directing users to a library of free resources.

Are career counsellors spending more time now with individual students?

While it might be expected that greater use of digital technologies in guidance provision has served to increase the time available to guidance counsellors to spend with individual students (Romito, Gonçalves and De Feo, 2020^[22]), this is not certain. PISA provides some insight into whether greater use of digital resources within guidance systems has accompanied counsellors working more closely with students on a one-to-one basis. Across 14 countries for which data are available between 2012 and 2022, the percentage of students who agree that they had spoken to a career advisor in school did increase on average from 48.6% to 52.5%. However, this increase was driven by strong growth in five countries: Austria, Hungary, Latvia, Portugal and the Slovak Republic. In six countries, the percentage fell and in three it remained comparable. While multiple factors might influence the extent to which students engage directly with guidance counsellors by the age of 15 (and change over time), PISA shows that it cannot be taken for granted that the current widespread use of digital technologies in guidance systems internationally has automatically led to students spending more time with their career advisors.

Enhancing labour market signalling

Digital tools possess the capacity to improve efficiency in labour market signalling with opportunities for students to gain a more representative understanding of patterns of labour market demand through their schools and their own research. The [Inspiring the Future](#) (United Kingdom) programme has connected schools and employee volunteers online to enable four million interactions between students and people in work since 2012 (Education and Employers, 2024^[27]). From another perspective, [Prospela e-mentoring](#) (United Kingdom) is designed to reduce the time needed by career counsellors to identify and connect students with appropriate mentors by using an AI algorithm. Digital tools can also address skills shortages by connecting schools with people in strategically important areas of work. For example, a key priority of [Proch'Orientation](#) (France) is to raise student awareness of regional infrastructure projects which will generate sustained employment opportunities. Other resources such as [Class Chats](#) (United States) and [Amazon Future Engineer Tech Tour](#) (United States) are designed to build student understanding of the reality of STEM (Science, Technology, Engineering and Mathematics) careers where misconceptions are common. [See it Be it: Green Jobs Intervention Series](#) (United Kingdom) aims to build connections between school subjects and future green jobs. The lessons series use pre-recorded videos designed to challenge stereotypes around who can be expected to do these 'green jobs' as well as connect what is learnt in school with the world of work. Another example of green career guidance is [Green Jobs for You](#) (Austria) developed as part of Bildungsberatung Österreich, an initiative of the Austrian Federal Ministry of Education, Science and Research and the federal states with funding from the European Social Fund. This hybrid delivery of career guidance involves information sessions by professionals in schools alongside online interactive quizzes that help young people to find green jobs that align with their preferences (Chang and Mann, 2024^[28]).

Are the occupational expectations of teenagers more closely reflecting actual patterns of labour market demand?

While students have enjoyed increased access to labour market information via digital technologies, international evidence suggests that over the last generation their occupational plans have become both more uncertain and, when they do exist, more narrow. Since 2000, PISA data show that the career expectations of students have become more concentrated, with over half of girls and boys planning on working in one of the ten occupations most popular among their peers (Mann et al., 2020^[29]). Moreover, the proportion of students across OECD countries expecting to work as a senior manager or professional has grown from 53% in 2000 to 63% in 2022. These occupations typically employ no more than one quarter of people in work (Mann, Diaz and Zapata Posada, 2024^[6]). Consequently, while technology-enhanced guidance systems have expanded student access to information about the labour

market at the same time, career expectations have narrowed. It cannot be taken for granted that the simple use of digital technologies within guidance programmes will broaden ambitions.

Increasing equity within career development

Digital technologies provide new opportunity to improve equity in student engagement in career development. These technologies can target resources to better support students who face different forms of social disadvantage and greater obstacles in building and converting their qualifications, skills and experience into successful employment. Analysis of data from the OECD Programme for International Assessment of Adult Competencies (PIAAC) shows that additional barriers can be observed linked to the socio-economic background, gender and migrant status of students transitioning into the labour market. Despite similar levels of qualifications and skills, young adults from these groups often experience higher unemployment rates, lower wages, less job satisfaction and poorer job quality than peers with comparable levels of education (OECD, 2024^[9]). Further barriers relate to ethnicity, sexual orientation, and disability. While the reasons for such inequitable outcomes are complex, guidance systems can play an important role in addressing these additional barriers by providing personalised support. Moreover, scope exists for guidance delivered online to broaden geographic access to important forms of career development, notably enabling engagement with working professionals and their workplaces.

At the heart of more equitable guidance is ensuring that all students have access to strong basis of career development (OECD, 2024^[9]). While practice might vary between and within countries, regions and schools, national governments have the opportunity of ensuring that core, high-quality resources are available to all notably through national career portals. Examples such as the [National Portal of Lifelong Learning](#) (Greece) and [Utdanning](#) (Norway) ensure student access to a range of important resources related to career exploration, post-secondary education and training provision and forms of employment regardless of when or from where information is sought. Such provision can also ensure that all students have access to forms of guidance that are less easily secured by students from more disadvantaged backgrounds. [Zmudri](#) (Slovak Republic) and [Route to Employment](#) (Czech Republic) for example provide students with considerable information related to transitions into the labour market. Such national, public systems can mitigate issues such as marketisation of resources which leads variation in provision between schools. Effective portals from trusted sources (like ministries of education and national career guidance agencies) that are up-to-date, bring together the main actors in the space and provide helpful activities that can enhance equity by providing this reliable information to all. A growing number of online tool moreover provide career development resources for primary schools, which rarely have access to professional guidance counsellors, to begin the process of career thinking early in a student's educational life, contributing to career development which is more equitable as it is less dependent on family resources (OECD, 2024^[9]) (see for example [Primary Futures](#) and [Careers Craft](#) [both United Kingdom]). From a further perspective, CV360 (Hong Kong) is designed to encourage students to look beyond their academic success in school to present themselves to future employers, drawing on an Expanded Notion of Work which encourages students to reflect on the breadth of their experiences and how they might be valued within employment. Such an approach addresses greater structural barriers faced by the most socially disadvantaged students as they seek to understand recruitment processes (Payne and Gollings, 2024^[30]).

The creation of large online networks can challenge inequalities by enabling lower cost campaign activities. The [Inspiring the Future](#) (United Kingdom) programme notably has recruited tens of thousands employee volunteers. Signing up online, volunteers provide important information about their personal characteristics and educational and employment journeys as well identifying parts of the country they would be willing to engage in activity typically on a face-to-face basis. The database has allowed national

campaigns such as [Inspiring Women](#), designed to make it easy for schools to connect with women working in fields where their gender is underrepresented. It has also allowed for targeted, campaigns in low-income areas, such as coastal towns and former mining areas. Additionally, schools have made use of the resource to support career-related activities within Black History Month and to provide students with physical and learning disabilities with opportunity to engage with role models from the world of work (Inspiring the Future^[31]).

Within guidance provision, an increasingly popular use of online tools is to enable student access to professionals willing to provide insights into their occupations regardless of geography. As noted above, one of the most popular uses of online tools is to enable career talks. Programmes such as [Career Village](#) (USA) and [Class Chats](#) (USA) are available nationally and even internationally, enhancing access in rural and remote areas. Recent digital innovations further provide students with opportunity to gain workplace experience regardless of their geographic location: [Amazon Future Engineer Tech Tours](#) (USA) provides virtual workplace visits and [Virtual TET: Virtual work experience](#) (Finland) enables online work placements. Greater equity can also be built more easily into access to traditional face-to-face placements by allowing students to search directories of placements online. In Germany, traditional job shadowing opportunities designed to help young people explore occupations where their gender is underrepresented - Girls' Day and Boys' Day – are submitted by employers, and reviewed by students, online (OECD^[32]).

A further advantage of more recently introduced digital resources is the capacity to operate in multiple languages using translation functionality, to adapt the presentation of material to students with visual disabilities, including text-to-speech functionality. These functions are features for example of [CiCi](#) (United Kingdom) which also has the capacity to translate text into 100 languages. Indeed, digital technologies are widely viewed as being effective in providing students with a range of disabilities with educational support (Good, 2021^[33]). Sites like [Career Portal](#) (Ireland) incorporate accessibility tools which respond to the needs of students with dyslexia and visual impairments notably through test-to-voice and voice-to-text functionality. However, many resources are currently not built with such accessibility in mind.

Digital divides: are they closing?

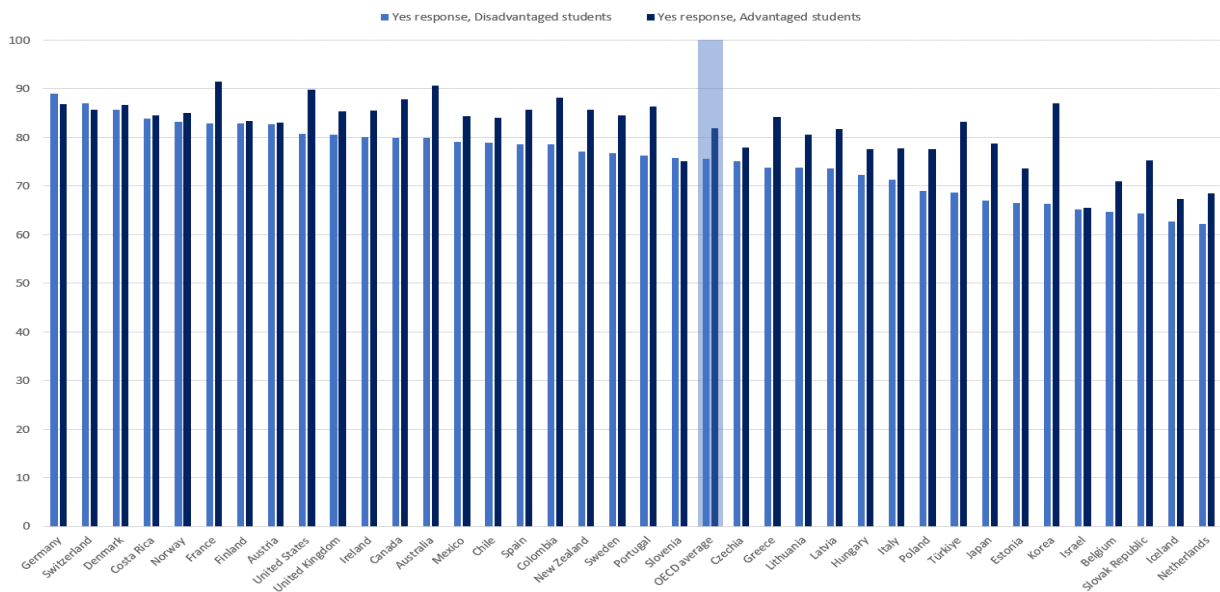
While digital technologies possess considerable capacity to address social inequalities, evidence from PISA 2022 reveals a continuing digital social divide. Use of the Internet for career development is shaped by the students' level of socio-economic advantage. Comparing the most and least socially advantaged quartiles of students (based upon the PISA index of economic, social and cultural status (ESCS) that combines parental occupation, education and household resources - Annex A1 (OECD, 2023^[34])), the most disadvantaged quartile are systematically less likely to go online to research both careers and education programmes. On average across OECD countries, 76% of students from the lowest socio-economic backgrounds researched careers on the Internet, compared to 82% of students from the highest quartile. This variation is evident in every OECD country with available data from PISA 2022, with the exception of Germany, Slovenia and Switzerland (**Figure 4**). A greater variation is seen in terms of education programme research with the most socially advantaged students (76%) ten percentage points more likely than their least socially advantaged classmates (66%) to use the Internet in this way. This pattern is consistent in all countries, except Costa Rica, Germany and Switzerland.

Looking at those OECD countries for which data are available in both 2018 and 2022, PISA data show that the social gap in Internet usage for career development has changed little. In 2018, students from the most socially advantaged students on average were 7.3 ppt more likely to have used the Internet to research careers. Four years later, PISA 2022 shows that the gap had closely marginally to 6.1 ppt. With regard to use of the Internet to research education and training programmes, a gap of 9.7 ppt in 2018 reduced to 9.1 ppt in 2022.

Gender also impacts participation levels in career guidance activities. On average in OECD countries who participated in PISA 2022, 83% of girls report that they had browsed the Internet for information about careers compared to 75% of boys. A similar variation is apparent in use of the internet to explore education programmes with an average of 78% of girls engaging in this activity compared to 67% of boys. This is in contrast to important forms of career development typically undertaken through face-to-face provision: on average, boys are more likely to report that they have attended job shadowing or work-site visits (9 percentage points more than girls), undertaken an internship (10 percentage points more) and visited a job fair (7 percentage points more) (Figure 1) in average. Overall PISA 2022 reveals that the most socially disadvantaged students are less likely to engage in career development activities than their most socially advantaged peers. The dataset also shows that students in the most rural locations (living in communities with fewer than 15 000 inhabitants) are 2.9 percentage points less likely than peers in urban areas (more than 100 000 inhabitants) to have used the Internet to research career information. Such variation in usage may reflect structural barriers preventing easy engagement in online resources. As OECD data show, it is more common for socio-economically disadvantaged, public and rural schools to report that they have inadequate digital technology (OECD, 2022^[35]).

Figure 4. The impact of socio-economic advantage on researching the Internet for information about careers

Student responses to question “I researched the internet for information about careers”, PISA 2022, by ESCS.



Note: Countries are ranked in descending order of percentage of disadvantaged students researching the Internet for information about careers.

ESCS refers to the PISA index of economic, social and cultural status. A socio-economically advantaged (disadvantaged) student is a student in the top (bottom) quarter of ESCS in his or her own country/economy.

Source: OECD PISA 2022 database

The COVID-19 pandemic revealed significant challenges in use of online resources with many students unable to engage in remote learning due to insufficient access to devices or connectivity. During the pandemic, 4.7% of students on average in OECD countries reported problems with accessing digital devices daily or almost every day during these closures, with 17.5% students reporting they had problems every day or week with access to digital devices. A further 22.1% of students reported they had

such regular problems accessing the Internet, with 16.1% reporting they had a problem one or two times a week. However, this average varies significantly between countries. UNESCO's Global education monitoring report 2023 reveals that over half a billion students, many from socially disadvantaged backgrounds or rural areas, were unable to engage in remote learning during the COVID-19 pandemic (GEM Report UNESCO, 2023^[36]). To address this, governments provided digital devices, internet data subscriptions to families in need, and free access to educational platforms/resources (Vincent-Lancrin, Cobo Romani and Reimers, 2022^[37]). Given these challenges, it is important for policy to focus on ensuring universal access to digital devices and internet connectivity. This would help bridge the digital divide, promoting equity and enabling all students to benefit from digital career guidance resources.

Challenges and concerns for policy makers in the use of digital technologies

While digital technologies offer opportunities to improve career guidance delivery and student outcomes, these benefits are not guaranteed. Several factors may undermine the effectiveness, efficiency, and equity with which digital technologies impact on career development. Risks come from both the technologies themselves and how they are implemented within systems.

Effective use of digital resources

Kettunen and Sampson (2018^[38]) stress that the strategic integration of digital resources into effective career development provision requires leadership from within education jurisdictions. Such leadership relates to measures to build the capacity of young people and career advisors to take advantage of new digital resources and understand their limitations and reasonably anticipated benefits.

Building digital competences among both career guidance counsellors and within the student body is essential to ensuring the effective use of online tools (Burns and Gottschalk, 2019^[39]; Julis, Fahriza and Wulandari, 2020^[40]; Kettunen et al., 2020^[12]). Studies show a demand among practitioners for greater support in developing relevant competencies (Cedefop; European Commission; ETF; ICCDPP; ILO; OECD; UNESCO, 2020^[16]; Moore and Czerwinska, 2019^[41]). In a field where technology is rapidly changing and research is in its early stages, the need to ensure that practitioners are equipped with relevant skills and knowledge to practice effectively is high. However, considerable variation exists in the extent to which countries articulate and require professional competencies from guidance counsellors (Cedefop, 2021^[42]). Training in the use of digital technologies has historically been limited in academic programmes designed to enable entry to the profession (Kettunen et al., 2020^[12]).

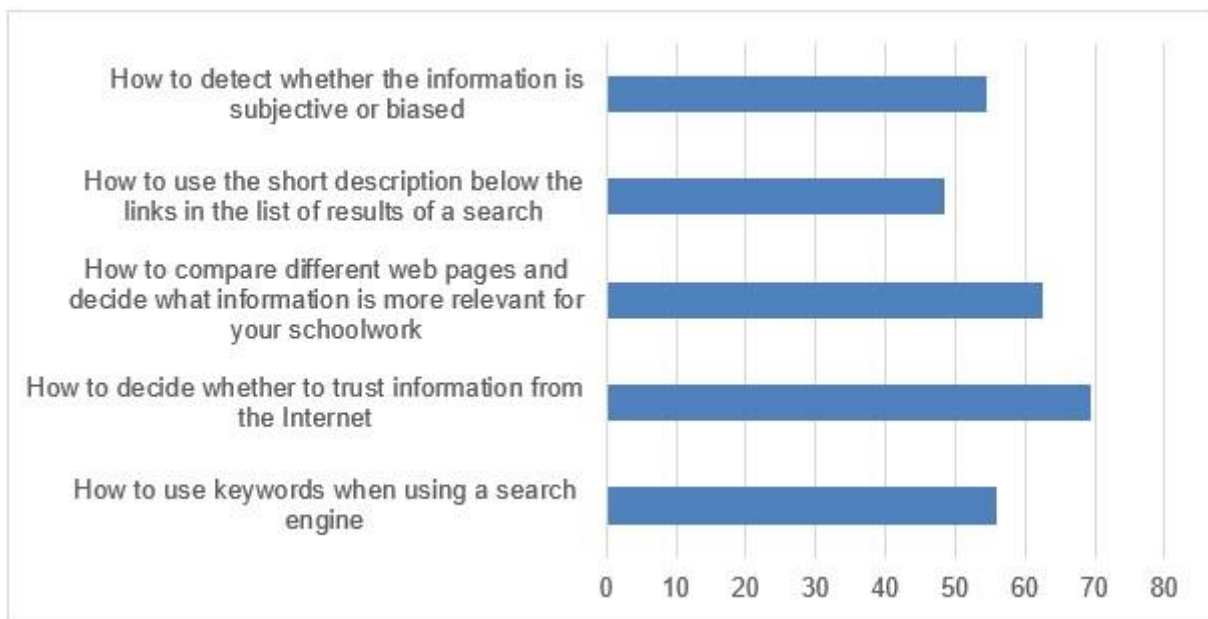
Internationally, a range of training programmes have been created to help practitioners to master the effective integration of new technologies into their work. There is a tendency in such provision to focus on the role of practitioners in working with adult clients. However, they point the way towards effective use in school settings and with young people. Kettunen et al. (2020^[12]) for example draw on international research to conceptualise core professional competencies of relevance to guidance practitioners within a 135-hour training programme designed and operated internationally by higher education institutions in Denmark, Finland, Iceland and Sweden. The programme focuses on using ICT to identify and evaluate online career information and resources and the creative use of tools to meet the needs of users; communicating effectively and efficiently with users through social media; designing spaces that integrate self-directed materials with interactive communication and knowledge of methods, techniques and activities that enhance participation and interaction in online discourse and foster collaborative processes in career learning among peer group members; and, creation of visible and trusted online presence.

Effective engagement also assumes that students possess the skills and knowledge to make good use of digital technologies. In part this relates to access to appropriate software and devices, that are reliably

connected to the Internet, at school and at home, but also the skills to use them well. PISA illustrates that access to digital devices has become nearly universal. In 2009, 89% of students in OECD countries/economies reported that they had access to the Internet at home. By 2018, this figure had risen to more than 95% (PISA 2018, Tables I.B1.54, I.B1.55 and I.B1.56).

However, many students report that they had not been taught key skills relevant to the most effective use of online information (Figure 5). As social media becomes a growing form of career information for young people, the capacity to critically assess information grows in importance.

Figure 5. Students reporting that they had been taught at school how to effectively search for information online



Source: (OECD, 2021^[43]). Table B.2.6

Given the importance of such competencies within the identification and review of career-related information and the growing availability of important information exclusively online (including, increasingly through social media websites (Nguyen, 2024^[44])), more effective education systems will ensure that all students are equipped with the skills needed to navigate potential resources.

Important within effective use of digital technologies, including the use of social media to access career-related materials, is the capacity to identify whether information is subjective or biased. Recent introduction of Artificial Intelligence within resources aimed at young people has raised notable concerns. AI algorithms are constrained by the databases they access and will offer advice based on this data (OECD, 2023^[17]). Algorithmic bias occurs “when an algorithm encodes (typically unintentionally) the biases present in society, producing predictions or inferences that are clearly discriminatory towards specific groups” (OECD, 2023^[17]). Crawford (2017^[45]) identifies types of harms that can result from bias. A system might allocate or withhold opportunities or resources to different groups. For example, bias may cause job vacancies not to be shown to women or to people of particular ethnicities due to them being historically underrepresented in particular fields. This raises concerns about justice and fairness and can lead to systematic difference in treatment across society. Systems might also reinforce societal discriminations against groups based on gender, disability, race, class etc. In career guidance, this can

be particularly harmful as societal biases can lead to distorted representations of the types of people who may be well placed to pursue specific occupations. Unintentional bias can increase the equity gap if not identified and addressed (Dr. Varsha, 2023^[46]). For instance, a study by the Berkeley Haas Centre for Equity, Gender and Leadership (Smith and Rustagi, 2021^[47]) found that 44% of the 133 AI systems analysed demonstrated gender bias while 26% exhibited both gender and racial bias. A concrete example of this bias is when a student requests career advice from a large language model (LLMs) which may suggest career paths based on existing societal biases, such as fewer STEM job recommendations for girls or fewer teaching job recommendations for boys. Therefore, recommendations offered by AI should be carefully evaluated by the users, similar to advice from human career counsellors. As the users in school career guidance are young people, it is advisable that career counsellors help students understand the information that is provided by AI as they may have a deeper understanding of the potential pitfalls and be able to guide students more carefully.

Efforts are ongoing in the education sector and beyond to actively reduce algorithmic bias in tools and platforms or to move unknown biases to known biases (Baker and Hawn, 2022^[48]). The OECD Digital Education Outlook (2023^[17]) provides six policy pointers for policy makers aiming to reduce algorithmic bias:

1. Consider algorithmic bias when considering privacy policy and mandates so that privacy requirements do not prevent researchers from identifying and addressing algorithmic bias.
2. Require algorithmic bias analyses, including requiring necessary data collection.
3. Guide algorithmic bias analysis based on local context and local equity concerns.
4. Fund research into unknown biases around the world.
5. Fund development of toolkits for algorithmic bias in education.
6. Re-design effectiveness clearinghouses to consider learner diversity.

Additionally, AI text generators have been known to produce ‘hallucinations’ where erroneous information is provided (Ji et al., 2023^[49]). Given that this advice is offered to young people, it is important that any AI system is trained carefully and has clear parameters of with regard to the advice that it can provide. Risks of poor information being received may be mitigated by the engagement of career counsellors in discussing the results of online research. Consequently, it is increasingly important that both young people and career counsellors possess the digital literacy skills needed to critically consider the opportunities and limitations of online resources (Westman et al., 2021^[14]).

The performance of digital resources goes beyond AI technologies. Usability and accuracy are essential for resources that offer information about career and education pathways. If a resource has information that is incorrect or out-of-date this could lead to misunderstanding and develop mistrust in the users. In a similar way, digital technologies that help users to construct their own resources, such as a CV, must be adaptable to cultural context or clear about the context that it was developed in to avoid mismatch between what is needed in a specific job market and how the information is presented. In a field where many digital resources are developed within market environments, effective guidance systems will encourage and enable purchasers and users of resources to reflect on whether tools are fully appropriate to need.

Historically, technology being introduced into educational ecosystems has been littered with inefficiencies, provision of devices without training or appropriate software as well as resources that are either not designed for the young people who are using them or are not regularly updated to ensure that they remain relevant (OECD, 2023^[17]). Alongside these inefficiencies are implementation or system inefficiencies (Kettunen and Sampson, 2018^[38]). In many countries, digital career guidance provision is fragmented with marketisation and the sheer volume of resources available creating an environment that is difficult for individual users to navigate (OECD, 2024^[50]). It is essential therefore that policy makers

work with career guidance professionals in designing and implementing digital resources, as is the case with [Careers Portal, Ireland](#).

While innovation in the use of digital technologies has benefited considerably from advances driven by private and third-sector organisations, this has implications for the effective use of such resources across the education community. A recent in-depth review of digital education across 29 OECD countries found that in many countries procurement decisions are left to schools and local authorities with guidance rarely provided on what to procure (OECD, 2023^[17]). Such responsibilities demand professional expertise to ensure optimal interoperability of resources and the capacity to secure good value in purchasing hardware, software and licenses to use digital tools. Consequently, advantages are apparent when national ministries and agencies negotiate with providers and introduce processes for assessing digital tools on behalf of the national educational community. This is especially the case given the importance of ensuring compliance with data protection and privacy legislation as many guidance tools collect personal information from young people (OECD, 2013^[51]). This poses a significant issue for digital resources that are working across borders as laws may be different in different nations (OECD, 2023^[17]). Understanding where data are stored, how they are protected and if and who they are being sold to is essential to ensuring effective governance and data protection (Figlio, Karbownik and Salvanes, 2016^[52]; OECD, 2023^[17]). When used in conjunction with a career counsellor, the data collected by artificial intelligence powered resources notably can be used to help to develop career plans as well as guidance interventions that are suited to the individual. To provide such personalisation, a large amount of data needs to be collected and ensuring the privacy of such data remains an important governance measure, but not one that is prohibitive to advancement (OECD, 2019^[53]).

A further substantial and urgent barrier to the effective use of digital technologies lies in the overwhelming lack of public evaluation of the great majority of resources. Considerable opportunity exists for national administrations to better support the purchasers and users of such tools by assessing resources to ensure that not only do they meet national demands in technical requirements, data protection and privacy, but also can be reasonably expected to enhance provision available to guidance counsellors and young people.

Next steps

The integration of digital technology in the delivery of career guidance services is currently undergoing a phase of expansive innovation. Digital technologies hold significant potential to improve the effectiveness, efficiency and equity of career guidance provision. The dissemination of resources involves a diverse range of actors, including private providers, third-sector enterprises and national governments. This diversity can foster innovation and provide diverse options for users, yet it also presents risks, notably if marketisation and competition undermine the capacity of users to make informed investment decisions and if significant minorities of students are not well placed to take advantage of increasingly sophisticated digital provision.

Of particular urgency is the need to address the overwhelming lack of robust evaluation of digital career guidance resources of all types and exploration of their long-term effects on student outcomes in relation to career development. In order to develop a coherent programme of evaluations, it is a priority to facilitate comparative analysis of resources, a process that is beginning with the creation of the [OECD Observatory on Digital technologies in Career guidance for Youth](#). Assessments of digital resources will benefit from continued growth in understanding of how in-person career development can be seen to enhance opportunities for young people (see for example, (OECD, 2023^[23]; 2021^[24])). Considerable need exists for new empirical studies which both compare face-to-face methods with digital methods and

explore comparative advantage in different forms of digital delivery as they impact on different student groups. Furthermore, as with all quality career guidance evaluations, it is essential to collect longitudinal data on student outcomes, including employment status, career satisfaction and career trajectory, to understand the impact of digital delivery more fully within career guidance. While building such an evidence base takes time, opportunity exists in many countries to gather better data from guidance counsellors and students well placed to provide expert testimony on the value of different digital approaches.

The bottom line: the many potential benefits of digital career guidance cannot be taken for granted.

The use of digital technologies is rapidly increasing in career development. PISA shows that the most common ways in which students engage in career development is through the Internet to research potential careers and future programmes of education and training. There is good reason to believe that digital technologies can increase the effectiveness, efficiency, and equity of guidance systems, but PISA data show that this cannot be taken for granted. Of particular urgency in such a dynamic and innovative field is the need to rapidly improve research evidence related to the design and delivery of new resources. The OECD Observatory on Digital technologies in Career guidance for Youth takes an important first step in nurturing a culture of evaluation and learning by enabling comparisons between digital approaches designed to meet similar objectives.

Career Readiness

This document was prepared by the Career Readiness team at the OECD.

The OECD Career Readiness project provides advice to governments, schools, employers, and other stakeholders on how to best prepare young people to compete in the everchanging labour market. Drawing on international datasets, the project identifies career-related indicators that make a difference to young people's success in adult employment.



For more information

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See: <https://www.oecd.org/education/career-readiness>

Visit: <https://www.oecd.org/en/about/programmes/odicy.html>

Key papers:

Covacevich, C., et al. (2021^[2]), "Indicators of teenage career readiness: an analysis of longitudinal data from eight countries ", OECD Education Working Papers

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