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Abstract

Governments recognise that careers guidance, underpinned by accurate labour market information, can help learners make post-secondary education choices that match their interests, aptitudes and abilities, and lead to rewarding employment. For this reason, they have invested in building linked education/employment information systems and other information resources which are displayed on websites targeted to learners and their families. However, researchers and governments agree that these efforts are often ineffective in informing learners' decisions – access to information is not sufficient to provide effective support to student choice.

Drawing upon the insights of behavioural economics, this paper examines how learners access and use information, and what this implies for the design of public study and career choice websites that aim to effectively support student choice. The report also takes stock of the career guidance websites in use in the majority of OECD countries, and sets out to provide actionable advice for policy makers to guide the design of effective information policy levers that support student choice.

Résumé

Les pouvoirs publics reconnaissent que l'orientation professionnelle, fondée sur des informations précises sur le marché du travail, peut aider les apprenants à faire des choix de formation post-secondaire, qui correspondent à leurs centres d'intérêt, leurs aptitudes et leurs capacités et les conduisent à un emploi gratifiant. Pour cette raison, ils ont investi dans des systèmes d'information connectés sur l'éducation et sur l'emploi et dans d'autres ressources d'information, qui sont présentées sur des sites web ciblant les apprenants et leur famille. Pour autant, chercheurs et pouvoirs publics s'accordent à dire que ces initiatives sont souvent inefficaces pour éclairer les décisions des apprenants –en somme, l'accès à l'information ne suffit pas pour un accompagnement efficace des étudiants dans leurs choix.

S'inspirant des enseignements de l'économie comportementale, le présent rapport analyse la manière dont les apprenants accèdent et utilisent l'information, et ce que cela implique pour la conception de sites d'information publics sur les choix d'études et de carrière qui ont vocation à accompagner efficacement les étudiants. Le rapport dresse également l'inventaire des sites d'orientation professionnelle utilisés dans la majorité des pays de l'OCDE, et des conseils concrets sont formulés à destination des responsables de l'élaboration des politiques publiques pour les guider dans la conception de leviers d'information efficaces, qui accompagnent les étudiants dans leurs choix.

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1. Introduction

Labour market information, embedded in careers guidance, can help learners make post-secondary education choices that match their interests and aptitudes and lead to fulfilling employment. Labour market information in study and career choice is more than information about earnings and employment prospects. Many governments have invested in recent decades in building linked education/employment information systems and other information resources which are displayed on websites targeted to learners and their families. But, while accurate, timely and relevant information can help individuals in the decision-making process, researchers and governments agree that these efforts are often ineffective in informing learners' decisions.

Learners form their views about the consequences of study choices from many information sources and influencers, including family, friends, teachers and school counsellors, as well as from news and social media. In recent decades, governments in OECD countries have joined this information ecosystem by developing web-based information resources to support study and career choice. Evidence shows that access to information alone is not sufficient for effective support. Information needs to make sense to students and be relevant, that is, tailored to students' needs as every student has a unique career path and a unique decision-making process. We reviewed how public study and career choice websites deliver on the requirement of access to and relevance of information.

Study and career choice websites also offer new possibilities for targeted, unobtrusive experiments that gather observational field data. This creates the opportunity to gather data on expectations, which will provide new possibilities to investigate when and how students learn about different educational and occupational options, and which options they consider and exclude.

The choices learners make about higher education – including field of study, type of programme and education institution – are decisions taken under uncertainty. This means, that at the time of choice neither the costs nor the benefits of the different options can be fully known by the decision-maker. However, while costs, in the form of foregone earnings, tuition fees and expenditure for accommodation, meals and transport will occur during the time at university, the benefits of a higher education degree – a better-paid, more stable and fulfilling career – are uncertain and will occur only in the future.

In other words, the decision to enrol in higher education presents a trade-off between immediate costs and future benefits. When confronted with intertemporal decisions, decision-makers tend to base their decisions on underlying beliefs about future events, and to assume that their future preferences will be similar to their current preferences.

On average, higher education graduates can expect higher earnings, reduced chances of unemployment, a greater likelihood of working in a job that offers high levels of fulfilment than their peers who start working with a secondary education degree or lower. Moreover gaining a higher education qualification is associated with a range of important non-pecuniary benefits. However, not all young people understand that these benefits will eventually apply to them. In particular, those who will be the first ones in their family to enrol in higher education are less likely to recognise the returns to higher education. They may also lack social capital, which is important to access and understand information about the costs and benefits of higher education.

Providing accurate, timely and relevant information about the requirements and consequences of study and career choices, and doing so in ways that cater to the complexity of intertemporal decision-making, is essential to support students to make good choices. This Working Paper seeks to help policy makers design information resources and levers

that help learners to make better choices. It also gives a stocktake of the study and career choice websites in use in OECD countries. It sets out to provide actionable advice for policy makers to guide the design of effective information policy levers that support student choice.

The paper provides responses to the following two research questions:

- What does behavioural economics tell us about the decision-making process and the factors that influence students' higher education choices?
- How can governments use the insights of behavioural economics when communicating labour market information to learners, helping them to discover previously unconsidered career options, and to make study and career choices well-matched to their interests and abilities, as well as labour market opportunities?

Starting with an overview of the factors at play when a young person faces a decision on choice of an educational pathway and career, the paper reviews key concepts of behavioural sciences as they apply to decision-making (Sections 2 and 3), followed by a discussion of the role of labour market information in orienting study and career choice (Section 4). The presentation of summary findings of a review of 34 public study and career choice websites in Section 5 is followed by a conclusion (Section 6)

2. Complexity of decision-making on educational and occupational pathways

For a young person choosing an educational pathway that leads to a satisfying and rewarding career is a critical and difficult decision. Decision-makers are subject to many pressures and influences and need to weigh multiple factors. In this section, we look into the complexity of decision-making on educational and occupational pathways, the range of influences that young people face and the timing of information interventions.

2.1. Educational choices start early in life and have many implications

Educational choices are sequential and, from early in life, have implications for occupational pathways. Teachers and parents in some OECD countries have to make decisions about the type of secondary education their children will be able to pursue, based on academic performance at age nine or ten. This early choice of type of secondary education choice affects the child's post-secondary educational options which, in turn, affects the range of career options that are open to them and hence, their later occupational choices.

Decisions about continuing education beyond secondary level, what type of education to pursue, which field of study and which institution are not one-time decisions. Ambitions and aspirations start from early age and are modified over time (Alstadsaeter, 2004[1]). Family, friends and the media play an important role in the formation of these preferences.

2.1.1. The role of parents in study and career choice

Parental influence is fundamental for educational choices and careers guidance, but varies by culture and socio-economic status (Altonji, Blom and Meghir, 2012[2]). Parents provide genetic endowments, they select early childhood education – with consequences for cognitive and non-cognitive development – they choose the neighbourhoods in which they raise their children and the schools their children attend, and they influence course choice.

Parents are also reference points and role models for career aspirations. Studies on the intergenerational persistence in educational attainment and occupational choice have

shown that young people often take the educational level of their parents as a reference point for their own aspirations for educational attainment (Goldthorpe, 2014[3]). Because of the link between educational attainment and socio-economic status, young people with higher socio-economic status are more likely to opt for higher education programmes compared to youth with lower socio-economic status (Page, Levy Garboua and Montmarquette, 2007[4]).

2.1.2. The role of schools

Careers guidance by teachers or school counsellors is the most common traditional channel through which labour market information reaches students. Across OECD countries, more than 60% of secondary education students are studying in schools that employ at least one counsellor who provides careers guidance. However, less than 50% of students have spoken to a school counsellor and little more than 20% of the 15-year-olds in OECD countries have spoken to a career counsellor outside their school (OECD, 2019[5]).

Schools can create reference points for the educational and occupational aspirations of their students. School context, the existence and type of career education offered in schools, and the influence of individual teachers have been found to be important in some cases, with some children's aspirations being developed through interests and aptitudes developed at school (Rowan-Kenyon, Perna and Swan, 2011[6]; Archer, DeWitt and Wong, 2014[7]).

School counselling offers an opportunity for students to receive information in a familiar environment. It allows counsellors to gain a comprehensive understanding of students' aspirations. Research has found that students perceive advice from someone they know as more relevant than from someone unknown (Diamond et al., 2012[8]).

Effective information about the world of work should be complemented by experience. In a wide-ranging assessment of the effectiveness of the UK school careers guidance approach, Holman (2014[9]) identified eight benchmarks to assess the design of careers support and guidance systems.

Table 2.1. Eight benchmarks for the design of school careers guidance systems

A stable careers programme	Every school should have career education and guidance. Its programme needs to be understood by pupils, parents, teachers, and employers.
Learning from career and labour market information	It needs access to good quality information about future study options. Young people need the support of informed advisors to make best use of available information.
Addressing the needs of each pupil	Opportunities for advice and support need to be tailored to the needs of each pupil.
Linking curriculum learning to careers	All teachers should link curriculum learning with careers.
Encounters with employers and employees	Every pupil should have many opportunities to learn from employers about work, employment, and skills – for instance, from visiting speakers, mentoring and enterprise schemes.
Experiences of workplaces	Every pupil should have first-hand experiences of the workplace through work visits, work shadowing and/or work experience.
Encounters with post-secondary education	All pupils should understand the full range of learning opportunities that are available to them – academic and vocational.
Personal guidance	Every pupil should have opportunities to meet with a career advisor whenever significant study or career choices are being made.

Source: Adapted from Holman (2014[9]), *Good Career Guidance*, https://www.gatsby.org.uk/uploads/education/reports/pdf/gatsby-sir-john-holman-good-career-guidance-2014.pdf (accessed 11 March 2020).

A key finding from Holman's (2014[9]) study is that information about work needs to be complemented by experiences of and encounters with work – employers, employees, workplaces and post-secondary education institutions. Holman argues that the *"multiple encounters with employers together with first-hand experience of workplaces is the best way to build a rich picture of the world of work… [and] work experience opens pupils' eyes to the realities of the workplace: the need to dress and behave in the expected way, to arrive punctually and follow instructions accurately.., [while] pupils [should] see, at first-hand, what it is like to continue their study or training in further education, on an apprenticeship or at university."*

Hence, an effective careers decision support system will make use of labour market information within an integrated system of supports and experiences and will provide information and experience as and when the young person needs it, in ways that the young person can manage.

2.2. Occupational preferences form over time

Forming career preferences is a multi-layered process that builds on the individual's personal attributes, socio-economic background, gender, the occupational, economic and cultural conditions in the individual's environment, the opinions and characteristics of people who exercise influence over the individual, and the nature of the schools the student attends – especially the schools' social composition, curricula and programmes (Vrontis, Thrassou and Melanthiou, 2007[10]).

Occupational preferences form over time, influenced by labour market information and the aforementioned contextual factors. As Alstadsaeter (2004[1]) reminds us, "[if we were to make] choices at the age of five, we would have nations of firemen". As we will discuss in this section, labour market information and role models can help learners build career aspirations and avoid generating occupational misconceptions.

2.2.1. Access to information

To be useful to learners' decision-making, information needs to be accurate, relevant, available and accessible – so that it does not need to be hunted out – and able to be tailored in ways that make sense to the student (Taylor, 2016[11]; Taylor, 2016[12]).

An important question for governments is how to make students aware of the increasing labour market demand for graduates from certain fields of study. Expectations about future levels of earnings direct students in their field of study choice. Other labour market information also provides useful orientation to students; for example, information about graduate employment rates, occupational pathways from entry-level jobs to jobs three, five and ten years after graduation, and the skills requirements for these jobs.

The absence of information about career prospects reduces the choice options for decision-makers. Difficulty of access to usable, accurate and validated information about the labour market outcomes of different educational options is likely to result in an excessive focus on earnings expectations, as well as students over- or under-estimating future earnings. Information about expected earnings can be misleading, and it is highly difficult for an individual to make sense of an average value that applies to a typical person but may not apply to them (Manski, 1993[13]). From a large-scale study of college applicants and enrolled students in Chile, Hastings et al. (2016[14]) found that students over-estimate early-career earnings by almost 40%. Over-estimation was highest among students from low-socioeconomic-status (low-SES) backgrounds, who were also more likely to rely on advertisements and publicity for labour market information instead of using more accurate resources. In an information experiment with final-year secondary school students in

Berlin, Peter and Zambre (2017[15]) showed that students whose parents had completed higher education lacked information about non-university options and the potential benefits of vocational education.

2.2.2. Financial literacy

OECD work on financial literacy has shown the importance of information, instruction and objective advice for the development of understanding, skills and confidence that allows learners to become more aware of financial risks and opportunities of different educational choices (OECD, 2017[16]). According to results from 20 participating countries in the Programme for International Student Assessment (PISA) in 2018, on average, only 10% of the 15 year-old students feel confident about their ability to look ahead and make decisions that will have future personal financial repercussions (OECD, 2020[17]).

One important aspect of the transition from school to post-secondary education is the financing of study. In countries where post-secondary institutions charge fees and where governments provide loans to support students while they study, many new students will be facing the concept of financial debt for the first time.

Weighting educational choices for their costs and benefits requires sophisticated analysis, taking into account a range of factors, including individual and institution-specific features, such as variations in earnings by field of study and institution, the selectivity of institutions, and one's likelihood of earning a degree (Oreopoulos and Petronijevic, 2013[18]). Oreopoulos and Dunn (2013[19]) found that information can reduce the number of students who indicated tuition and other costs as main reasons for why they were not considering a post-secondary education. They studied students in disadvantaged neighbourhoods in Toronto, providing a website presenting the financial benefits of post-secondary education and use of a simple financial-aid calculator. Students who used this site were also likely to seek out additional information about enrolment and accessing financial aid.

Information about the likely expenses of maintaining a family, saving for children's future education and for retirement can also help young people in their career decision-making.

2.2.3. The consumption value of education

While creating opportunities for a career is one primary motivation for pursuing higher education, this factor is often only part of the driver for enrolment. For some learners, the consumption value of education – that is, the joy of learning new things, meeting new people and living in new places – greatly influences their educational choices. As Oreopoulos and Salvanes (2011[20]) state, *"schooling generates many experiences and affects multiple dimensions of skill that, in turn, may affect central aspects of individuals' lives both in and outside the labour market."*

Individuals differ in their beliefs about the consumption value of education, but not much is known about whether this difference is systematic and whether beliefs differ by gender or socio-economic group. A recent survey of secondary school students in the United Kingdom found, controlling for cognitive ability, that the perceived consumption value predicts students' plans to stay longer in education, and that high-SES students were more likely to believe they would enjoy continuing full-time education compared to low-SES students. The study suggests that policy interventions, which make the pecuniary and non-pecuniary benefits of further education more salient might have the potential of increasing enrolment in higher education, especially among students with a low socio-economic status (Belfield et al., 2016[21]).

2.2.4. Choosing STEM-related occupations

Governments in many countries have encouraged aspirations for careers that build on science, technology, engineering and mathematics (STEM) fields. These efforts tend to be more effective when introduced early on in education and if they are continued over time. Avoidance of science-related careers can be related to factors such as confidence, low self-efficacy beliefs, social and cultural norms, lack of role models, lifestyle values and work-family balance preference (Wang and Degol, 2017[22]).

ASPIRES, a longitudinal study in the United Kingdom, found that students who do not express STEM-related aspirations at age 10 are unlikely to develop STEM aspirations as they get older (ASPIRES, 2013[23]). The study team surveyed students, aged 10-14, to explore how preferences develop and what influences the likelihood of a young person aspiring to a science-related career. The study found that only 15% of the surveyed youth aspired to become a scientist, while almost two-thirds agreed that they learn very interesting things in science classes. Conversely, more than half of the surveyed students had career aspirations related to business and management. One of the explanations proposed by the study is that the students had a much clearer understanding of careers in business and management than of science-related careers.

Several studies suggest that the presence of gender stereotypes in careers orientation can substantially limit awareness of choice options. In a study with final-year secondary school students in Italy, Barone et al. (2017[24]) found that informing students about the labour market outcomes of educational choices had an effect on gender segregation in the field of study choice in higher education. The study found that providing information on outcomes increased the participation of girls in higher education and reduced the over-representation in certain fields of study.

2.2.5. The importance of role models

Role models are important for study and career choices. They can help young people build career aspirations by making a credible link between the learners' view of themselves today and an aspirational view of the future self. Socio-economic status and gender are important factors. Breda et al. (2020[25]) tested the effect of a one-hour exposure to female scientists who acted as role models for secondary school girls' perceptions of science careers in a randomised experiment in secondary schools in Paris. The study found that these role models convey a positive and more inclusive image of STEM careers. The intervention significantly improved the perceptions of science-related careers, and raised, in particular, the interest of girls in STEM higher education programmes, leading to a significant rise in the proportion of girls enrolling in selective STEM programmes.

2.3. Timing of information in careers guidance

To be effective, information needs to be provided at the right time. Table 2.2 gives an overview of the sequential nature of decision-making processes from early years of education up to the end of secondary education. Taylor (2016[11]) distinguishes three moments of choice which occur at points from early education to the end of secondary school:

- **idea-forming events** that help learners to generate an interest in a particular occupation;
- **hard choice moments** that have a consequence for future educational and occupational choices, such as entry to secondary school and selection of subjects;

- **feedback points**, which either re-affirm a choice or lead to reconsideration of the choice, for example, temporary work experience or career guidance.

Given the principle of providing information only as needed, study and careers guidance systems need to be set up so as to deliver information to prepare students for those hard choice moments, while making personalised information available as it is needed to respond to the idea-forming events and at feedback points.

Table 2.2. Moments of choice from early years to the end of secondary education

		Idea-forming events that plant a seed for a study pathway or career	Hard choice moments	Feedback points that re-affirm or lead to reconsideration of choice
Early years and primary school	Childhood experiences	X		
	Interactions with adults	X		
	Entry secondary school		X	
Secondary school	Careers depicted in TV and social media	X		
	Subject selection		X	
	Internships	X		X
	Career guidance	X		X
	Career fairs and open days	X		X

Source: Adapted from Taylor (2016[11]), "Moments of choice: How education outcomes data can support better informed career decisions", https://www.careersandenterprise.co.uk/sites/default/files/download-files/moments_of_choice_report.pdf (accessed 15 April 2020).

An experimental study of final-year secondary school students in Finland, Kerr et al. (2012[26]) found that information about potential labour market implications of their educational choices resulted in students changing and updating their preferences, but that it had no impact on immediate applications or enrolment patterns. The study concluded that the timing of the information was too late for prospective students to take it into account for their actual higher education choices and recommended earlier interventions as well as a student guidance system.

Recent studies demonstrate how small differences in the process of transitioning to higher education can significantly affect enrolment, particularly for underrepresented groups (French and Oreopoulos, 2017[27]). In the United States, students who have been admitted to post-secondary education must complete enrolment paperwork. Castleman, Schwartz and Baum (2015[28]) estimate that roughly 15% of college-bound low-SES students and 10% of high-SES students do not complete the enrolment procedures. Personalised text messages and support from counsellors increased enrolment, particularly among underrepresented groups.

Psychological characteristics and emotions play a significant role in decision-making processes. Teenagers are much more susceptible to short-term thinking and present-biased preferences, and have lower levels of self-control, patience and perseverance compared to adults. This will be discussed further in Section 3.

2.3.1. Internships

Internships are important moments of occupational decision making. Across OECD countries, around 30% of 15-year-olds have taken part in an internship during their studies (Mann et al., 2019[29]). Internships can improve a students' confidence that they are capable of performing complex job assignments related to a profession, and can create the feeling of belonging to a workplace culture. This can lead students to firm up on study options, or to try to discover more about the occupation and the study path leading to that occupation.

2.3.2. Readiness to study

Giving students feedback on their academic readiness when they are applying to a higher education programme can help prospective students understand the requirements of a programme and the potential need for additional preparation and support.

For example, the programme *Orientation Active*, introduced by the French government in 2009 in response to traditionally high attrition rates, provides this type of information. The programme invites last-year secondary students to select study programmes on a government-run website, which gives universities access to the schooling records of applicants. An algorithm allocates applicants according to the number of available study places. Applicants receive reviews from the universities about their academic preparedness for the programme to which they intend to apply. Using discontinuity analysis, Pistolesi (2017[30]) measured the effect of these reviews on the enrolment intentions of applicants and found that positive feedback had little effect on enrolment decisions, but that negative feedback decreased the proportion enrolling by 14 percentage points. If that sort of feedback were to be accompanied by advice on suitable alternatives, then learners could end up on more suitable paths.

3. The behavioural context for decision-making

Many policy makers trust that the presence of high-integrity information, free to the user, is sufficient for students and their parents to make full use of it. The assumption is that if someone acts contrary to their own interests, the cause is likely to have been a lack of information about benefits, so the remedy must be to provide more and better information. However, the recent proliferation of study and career choice information and websites appears not to have resulted in a generation of young people who make well-informed decisions on careers and higher educational pathways (Hume and Heal, 2016[31]).

The belief that poor decision-making results from poor information is based on two assumptions. First, it assumes that decision-makers act as rational agents capable of understanding the consequences of their actions, weighing costs and benefits, assigning equal value to immediate tasks and future tasks and then choosing the set of options that meets their needs (French and Oreopoulos, 2017[27]). The second assumption is that expectation formation is homogenous and all decision-makers search for and understand information in the same way. The evidence suggests that these assumptions are false.

Understanding the sequential and heterogeneous nature of the decision-making process, and the factors that influence study and career choices will help policy makers design effective information policy levers.

3.1. The behavioural model of decision-making

Good information may be a necessary condition for good decision-making, but the evidence suggests it is not sufficient (Taylor, 2016[11]; Hume and Heal, 2016[31]). Part of

the reason is the complexity of careers decision-making, as described in Section 2 of this report. In addition, a decision on choice of educational pathway or on choice of occupation is an *intertemporal* decision, one that balances certain near-term costs against uncertain, future benefits (French and Oreopoulos, 2017[27]).

Behavioural economics provides a useful conceptual framework for understanding the sequential and intertemporal nature of decision-making on careers and higher education options, French and Oreopoulos (2017[27]) argue that intertemporal decision-making carries a number of biases – for instance:

- **Present bias**: Behavioural scientists argue that people tend to place greater weight on actions or tasks that have an early or immediate return than on those that have a delayed return, even if they are told that the future return carries a significant benefit. This factor may cause people to delay, defer or give insufficient time to tasks associated with planning for their educational career.
- **Inattention**: Someone may defer or avoid taking a decision because he or she believes, consciously or subconsciously, that the cost of considering that decision is high relative to the benefits. If the benefits are seen as being far into the future, the value of those benefits is discounted (whereas the time to consider the alternatives represents an immediate cost).
- **Social identity**: Social context and norms reduce the options a decision-maker considers. Individuals take account of questions like: "what kind of person am I?" and "what are others like me doing?". These sorts of questions provide reference points for deciding how to act. They suggest that, in making decisions, people value benefits in ways that are individual, possibly idiosyncratic.
- **Confirmation bias**: This means that the people may reject new information if it does not fit with the information and the frame of reference that they already have.

Classical economic theory assumes that people assign the same value to a task, whether it is a near-term task or a future task. Behavioural economics models provide that individuals' valuation of tasks changes over time and that people may make different decisions in different social contexts.

- Given the complexity of the decisions needed on educational pathways and careers, and given the intertemporal nature of those decisions, in practice, decision-makers use *heuristics* – that is, practical approaches, such as trial and error or "rules of thumb" – when confronted with these choices (instead of adopting a purely rational approach) (French and Oreopoulos, 2017[27]). Understanding the sequential and heterogeneous nature of the decision-making process and the factors that influence students' higher education choices will help policy makers design effective information policy levers.

3.1.1. The decision-making process

Cognitive, emotional, and contextual factors shape decision processes. Decision-making involves two broad sets of options that are progressively reduced towards a final choice (Bruch and Feinberg, 2017[32]). The "awareness set" includes all options that are known to the decision-maker but excluded because irrelevant and unattainable, and the "consideration set" of all attainable and relevant options, from which the final choice is made. Although information can expand both the awareness and the consideration set of options, the final choice is constrained by the idiosyncratic needs, beliefs and preferences of the decision-maker, as well as behavioural barriers that affect all of us in how we make decisions (Damgaard and Nielsen, 2018[33]).

When confronted with important and complex decisions, individuals have difficulties defining goals, gathering relevant information and weighing costs against benefits. Such a cognitive overload is typical for post-secondary education choices. Many young people struggle to engage with thinking about different career options (Taylor, 2016[11]). The task appears too difficult. The young person is faced with lot of information, but struggles to make sense of it, leading to "choice overload". Individuals typically do not use the wide range of information available but base their choice on the most salient information. Hence, a common response of young people is either to procrastinate and postpone the decision, or to opt for the default option, that is, to follow the example of friends and peers or the advice of parents and other influencers (Castleman, Schwartz and Baum, 2015[28]).

Individuals are likely to ignore new information if it does not fit with the information they already have – in other words, they are subject to "confirmation bias". Social context, norms and framing further reduce the consideration set of options to what "people like me" tend to choose. For instance, for first-generation students, information about the costs of attending higher education is typically more salient than information about future benefits. Within their primary social network, it is easier to find information about the costs than about the benefits of higher education and field of study choice.

The framing of options greatly influences the decision-making process. Decision problems can be framed in multiple ways, and decision-makers respond differently to different but objectively equivalent descriptions of the same problem (Tversky and Kahneman, 1981[34]). The decision frame includes the decision-maker's beliefs and preferences, i.e. "conception of the activities, results and implications of a particular choice". The decision frame is substantively influenced by how the decision problem is presented, e.g. "68% of our students are in graduate jobs 12 months after graduation" (framed as gain) "32% are not in graduate jobs one year after graduation" (framed as loss) (Diamond et al., 2012[8]).

3.2. Teenagers are more susceptible to short-term thinking

Teenagers are more susceptible to short-term thinking and present-biased preferences than adults. Recent neuroimaging studies have shown that the executive function of the brain, which helps individuals create holistic views of themselves and how they interact with the world around them, will not be completely developed until a person is between 25 and 30 years old (for an overview (Lavecchia, Liu and Oreopoulos, 2015[35])). The limbic system, instead, matures much earlier. That part of the brain registers desires for immediate rewards and pleasure, and is thus highly responsive to monetary stimuli, novelty, and social rewards.

Emotions and psychological characteristics play an important role in decision-making processes, particularly self-control to regulate own behaviour and achieve long-term goals. Once a prospective student has decided to enrol in a higher education degree programme, he/she will have to make a number of decisions and commit resources and efforts before they will have earned a degree. To undertake each step of the application procedure on time, manage course requirements and so on requires the student to demonstrate self-control. Students with self-control problems tend to postpone important decisions.

Parents could potentially compensate for their children's deficits in self-control, by advising and supporting the young person during the period of decision-making. However, since self-control is correlated with socio-economic status, children from disadvantaged educational backgrounds (and therefore, likely lower socio-economic groups) are less likely to get parental support and will depend even more on educational activities that help them to overcome gaps (Damgaard and Nielsen, 2018[33]). Education that stimulates the development of self-control, perseverance and other non-cognitive skills can help to

develop the executive function of the brain and can thus positively influence educational decision-making (Koch, Nafziger and Nielsen, 2015[36]).

3.2.1. Information processing skills and limited attention span

Young people differ in their internet literacy and information processing skills; this means that not all will be able to take advantage of all the features on the website. Studies that focused on testing and observing internet skills of Dutch high school students, young adults and older generations (van Deursen, van Dijk and Peters, 2011[37]; van Deursen and van Diepen, 2013[38]) suggest that youth often lack the ability to take full advantage of website functionality and that many lack the skills to find information through selective searching.

Internet literacy and information processing skills are related to cognitive and meta-cognitive brain functions that enable effective website navigation (OECD, 2015[39]). These skills are still under development during teenage years (Lavecchia, Liu and Oreopoulos, 2015[35]). Websites that aim to widen students' range of choices should be structured in a way that is adapted to the cognitive capacities and information search and processing preferences of their target audiences.

In a series of studies of young people from the United States, the United Kingdom and Australia, researchers explored the use of websites and the content and functions that appeal to users (Joyce and Nielsen, 2019[40]). Children, teenagers, college students and adults were found to differ, but also have similarities. The main findings are summarised in Table 3.1.

Table 3.1. Internet habits of children, teens, students and adults

	Children	Teens	Students	Young Adults
Search	Bigger reliance on bookmarks than search, but older children do search	Heavy reliance on search; some difficulty formulating search queries; click top-most results in search results' page		
Scrolling	Do not scroll (younger); some scroll (older)	Do scroll		
Animation and sound effects	Pay attention to moving objects and sounds	Might appreciate them to some extent, but overuse can be problematic	Dislike them; auto-play sound can be found disruptive in dorms	
Patience	Want instant gratification	Strong negative feelings towards waiting for things to load or having to close pop-ups; easily distracted	Want answers quickly; no patience for complicated interactions; easily distracted	Want answers quickly, but more likely to wait than college students
Trust and credibility	Want good initial reaction; credibility is less important because goal is mainly entertainment	Difficulty judging credibility of web page	Very critical; quick to judge websites	Less critical of websites than college students; still quick to judge
Age-targeted design and content	Crucial, with very fine-grained distinctions between age groups	Want age-appropriate content; prefer sites with neutral graphics rather than childish ones	Want age-appropriate information, but do not want everyone to sound 'hip'	Less critical for most sites

Source: Adapted from Joyce and Nielsen (2019[40]), *Teenager's UX: Designing for Teens*, https://www.nngroup.com/articles/usability-of-websites-for-teenagers (accessed on 12 April 2020).

Studies that observe the influence of gender on internet skills present mixed results. Some studies report no significant gender differences in searching, navigation and comprehension (van Deursen and van Diepen, 2013[38]; Enochsson, 2018[41]; Gui and Argentin, 2011[42]). In a study of lower secondary school students from 21 countries that explored a broader set

of information and technology skills, Fraillon et al. (2014[43]) reported that female students performed better than their male counterparts. However, male students showed higher levels of interest and enjoyment in internet-related activities compared to female students.

The attention span of internet users is limited and decreases as they click through websites. In eye-tracking research on university students in the United States, scientists tracked the most important and difficult elements of eleven popular websites (Pan et al., 2004[44]). The results show that students spend less time looking at single elements as they access more content. This has implications on website design. Ideally, website users are directed in the easiest and efficient way to reach the content they are most interested in. We will come back to this is Section 5 when we present the results of the website review.

4. Labour market information in study and career choice

Labour market information is highly relevant for post-secondary educational choices. It generally ranks among the "top five" in higher education study choices beside information about the quality of teaching and learning, student supports, social activities and life on campus (Diamond et al., 2012[8]). In this section, we present what labour market information is, sources of information, and who generates and delivers labour market information.

A question that requires further attention – beyond the scope of this Working Paper – is how to generate relevant knowledge about future labour market opportunities using currently available information, as digitalisation is changing the world of work in fundamental ways.

4.1. Labour market information

Labour market information in study and careers choice is more than information about earnings and employment prospects. Woods and O'Leary (2006[45]) offer a comprehensive definition of labour market information, that is, "any quantitative or qualitative information and intelligence on the labour market that can assist [individuals] in making informed plans, choices, and decisions related to business requirements, career planning and preparation, education and training offerings, job search, hiring, and governmental policy and workforce investment strategies".

Hence, labour market information includes information and intelligence on:

- labour market conditions (nationally, and/or locally); including demand and supply trends;
- projections of future demand and supply;
- occupational trends and opportunities;
- skills requirements and links between training and education and careers;
- interpretation and analysis of the data for various customer needs (Woods and O'Leary, 2006[45]).

4.1.1. Different learners have different information needs

Different types of learners have different needs for labour market information. Secondary school students need to understand what post-secondary education options they have and how those relate to possible occupations and careers. A graduate who is facing transition

from education to work will be more interested in the type of entry positions available in a certain occupation and the likely remuneration they offer. A prime age worker who wishes to change occupation will want to know about related occupations – their requirements for cognitive skills, task-based skills, and knowledge, as well as the level of remuneration they offer.

Expectations about future levels of earnings influence students in their field of study choice. At the same time, other labour market information provides useful guidance for students; for example, information about graduate employment rates, occupational pathways from entry-level jobs to higher-level jobs and the skills requirements for these jobs.

Ideally, labour market information that is relevant for student choice must provide responses to the following questions:

- What are possible jobs for me?
- What additional skills do I need?
- What will it be like to do these jobs?
- What are my career development opportunities in these jobs?
- What is the remuneration path for these jobs?
- Will I have to move to somewhere else?

4.1.2. Sources of labour market information

Labour market information can be derived from a range of sources. Some can provide longitudinal views of the labour market, while others are cross-sectional. Information can be derived from a range of sources, for example:

- *Labour force surveys*: OECD countries run regular household labour force surveys that are used to assess employment and unemployment rates related to a range of demographic and educational variables. Data from these surveys also allow for cross-country comparisons of labour market indicators.
- *Employer surveys*: Skills analysis and forecasts by government agencies or by sector/industry organisations.
- *Graduate destination surveys or outcomes surveys:* These surveys are run by post-secondary education institutions, associations of institutions or governments and aim to analyse the outcomes (including the labour market outcomes) of educational qualifications for graduates.
- *Government administrative databases*: Administrative data are data that have been derived from government agency transactions. While the data are recorded for administrative purposes, they can also be used for research, analysis and monitoring. Datasets on education, employment, tax and social security can be linked at the individual level to create a longitudinal, multidimensional view of a population, which gives a view of the employment outcomes from education – see below for more details of linked administrative data.
- *Job vacancy surveys:* These draw data on the location, skill requirements, occupational level and remuneration level of jobs from recruitment advertisements. Best-known is the analytical data produced daily on job vacancies by US analytics firm Burning Glass Technologies, which packages job vacancy data for different types of users.

- *International surveys*: The OECD's Programme for the International Assessment of Adult Competencies (PIAAC), or Survey of Adult Skills, includes a skills survey that allows employment and labour market variables to be linked to measured skills, to educational attainment and socio-demographic variables. Those data also allow cross-country comparisons of labour market data. Likewise, the OECD's Programme for International Student Assessment (PISA) survey examines the labour market aspirations of 15-year olds.

Localised labour market information allows people to better understand local and regional labour market developments, and help with often difficult decisions of moving to another place. Having recognised the lack of timely, frequent, local and granular data as an important gap in Canada's labour market information, the Labour Market Information Council (LMIC) prioritised collaborating with partners and stakeholders and identified several approaches, namely survey-based options, linking administrative data, and modelling methods (Labour Market Information Council, 2019[46]).

4.1.3. Who generates and delivers labour market information

Governments have an important role to play in the creation and maintenance of labour market information systems. A public labour market information system creates standards of accuracy, timeliness, comparability, neutrality, geographical coverage and detail, classification (e.g. industries, occupations, education levels/programmes), methodology and metrics, and accessibility (Woods and O'Leary, 2006[45]).

The provision of labour market information by actors other than the government or national public agencies may be niche-oriented, regional and neither complete nor comparable. There are some exceptions, such as the US private-sector firm Burning Glass Technologies, which provides large-scale, real-time data on job vacancies in several countries. Higher education institutions also present labour market outcome data to recruit students, but accuracy and comparability of information can be a challenge.

There are several approaches to the generation and dissemination of public labour market information (Woods and O'Leary, 2006[45]):

- Government determines data outputs and publishes the data and analyses of the data on official websites. In some cases, the government incorporates its labour market information into structured careers advice tools.
- Government determines and publishes the data and makes the data available through application programming interfaces (APIs) for other providers (such as private sector careers advice providers) to analyse and publish the data.
- Government creates mechanisms (such as partnerships or data labs) that allow other providers to determine the data, analyse it and publish their outputs (Taylor, 2016[11]).

These approaches are not mutually exclusive. For instance, in the United Kingdom, the Department for Education publishes the Longitudinal Education Outcomes (LEO) data, but encourages use, analysis and republication of those data by researchers, careers advice networks, private sector recruitment firms, and firms that supply services to schools and students (Taylor, 2016[11]).

Canada provides an example of a national labour market information platform that makes information available for a variety of audiences. The Labour Market Information Council (LMIC) was established in 2017 by the federal, provincial and territorial governments to conduct research and data analyses and to identify priorities for the collection, analysis and

dissemination of labour market information (Labour Market Information Council, 2019[46]). The LMIC collaborates with a wide group of stakeholders, including the private sector, federal, provincial, and territorial governments and Statistics Canada.

The second approach involves government generating high-integrity information and collaborating with private information developers/providers in the use of the data. This approach has the potential to offer benefits, as private providers may have a better understanding of how to meet the needs of users and how to present, frame and place information to make it accessible and attractive in searches (Taylor, 2016[11]).

As an example of the third approach, Google offers a search function that shows users key graduate labour market outcome metrics for the US higher education institution they have searched for.

4.2. Creating labour market information by linking administrative data

Some governments in OECD countries have linked administrative data from a range of sources to build an integrated longitudinal view of how individuals move through the labour market. These datasets link the employment data at an individual level to education data, making it possible to see how people's employment outcomes are affected by their educational qualification and, possibly, other factors, while controlling for level and field of study, demographic characteristics and prior educational attainment.

In the United Kingdom, the Longitudinal Educational Outcomes (LEO) data comprise tertiary education qualification attainment by level and field of study and by institution linked to:

- personal characteristics such as sex, ethnic group and age (from post-secondary education institutions);
- school achievement data (from schools);
- employment data and income data (from taxation records);
- welfare benefits claimed (from benefits records).

The data have been linked at an individual level following strict confidentiality protocols (Department for Education, 2019[47]), creating a research database that contains a view of each person's employment and earnings over ten or more years. Those data can be analysed to provide information on the range of earnings a graduate can expect.

The UK Department for Education recognised the potential value of the LEO data in careers advice, but also realised that it would need to be contextualised to make it usable in careers advice. It therefore commissioned reports on how best to use these data in the careers system (Taylor, 2016[11]; Hume and Heal, 2016[31]).

In New Zealand, the national statistics agency, Statistics New Zealand, has built a similar dataset but has also added data on an individual's transactions with the housing, migration, health, justice, and care and protection systems in a dataset called the Integrated Data Infrastructure, from which data similar to the LEO data can be analysed (Statistics New Zealand, 2019[48]; Statistics New Zealand, 2016[49]).

The development of linked administrative data creates comprehensive, highly detailed and authoritative labour market information. However, given that richness, it needs analysis, summarisation and contextualisation before it can be useful for use in career decision-making advice and tools. This requires a government data strategy to support career choice (Taylor, 2016[11]).

4.3. Layered data systems

The development of authoritative, comprehensive and high-integrity labour market data is only half the challenge. Once outcomes data have been created and published the important next step is to create usable, useful information packages that will present the information in ways that help young people and their families make sound educational and occupational choices.

To address this sort of question, governments in some OECD countries have started to present data on educational pathways (e.g. entrance requirements, costs, completion rates and student experience data) alongside employment outcomes data and forecasts of labour demand and supply. This "layering" of data typically requires collaboration across different ministries and agencies.

Layered data from different official sources can be accessed through single websites and/or mobile applications. In a layered data system, the government determines, analyses and publishes data and also makes the data available through application programming interfaces (APIs) or data labs, allowing other providers to analyse, interpret and publish the data.

The aim of these layered data systems is to provide students, their families and career advisors with easy access to high-integrity information about the costs and benefits of post-secondary educational choices. Layered data systems are most advanced in the United Kingdom where many private providers of data and career advice, both non-profit and for-profit, exist alongside public sources of information (Box 4.1). Further examples are the United States Canada and New Zealand.

Box 4.1. Layered data systems in the United Kingdom and the United States

UNISTATS is the official website for prospective higher education students in the United Kingdom to compare different courses across higher education institutions on a range of factors including fees, graduation rates, student satisfaction, graduate jobs and earnings. UNISTATS is fed by a comprehensive labour market information database, "LMI for All". The portal is funded by the Department for Education.

During the development phase (2012-17), various sources of labour market information were identified and tested. These sources were brought together in an automated, singular, accessible location to be used by developers to create websites and applications for career guidance purposes. The Department for Education has organised competitions for developers to design applications. At least 12 organisations or consortia have developed a website or web interface, and three organisations have developed mobile applications to help individuals make better decisions about learning and work.

In the United States, the College Scorecard provides information about the average annual costs of study programmes, graduation rates, average wages and lifetime earnings of graduates. The Department of Education provides open access to the data behind the Scorecard, including a vast array of data on student completion, earnings, debt and repayment, disaggregated by various student subgroups, including first-generation students, low-income students in receipt of federal student aid. The entire dataset spans nearly 20 years of information from more than 7 000 institutions and covers multiple federal sources, including the Integrated Post-secondary Education Data System (IPEDS), the National Student Loan Data System (NSLDS), and administrative earnings data from tax records maintained by the Department of the Treasury. The

website allows users to search for colleges by name, region or type. Currently, the dataset does not include students who do not receive federal grants and loans, or students who either dropped out of programmes or transferred to other institutions.

The labour market information in the College Scorecard is linked with the Occupational Information Network (O*NET), a government database of detailed job descriptors. On the O*NET website, learners can find information related to occupations and related skills requirements, and can complete a test, the O*NET Interest Profiler, which asks 60 questions about typical work activities in occupations to help learners identify suitable careers.

Source: (U.S. Department of Education, n.d.[50]; LMI For All, n.d.[51]; Unistats, 2019[52]; National Center for O*NET Development, n.d.[53]).

4.4. Digital enhancement of career guidance

With the recent increase of labour market information available online, the direct or unmediated use of labour market information by students has increased. Online tools can prepare students in advance for their meetings with career advisors by exploring a set of educational options and narrowing them down to the student's interests, aptitudes and career expectations (Vuorinen, Sampson and Kettunen, 2011[54]). Online counselling is also cost-efficient and practical when school counsellors are unavailable, or when there is absence of career centres, as in the case of the COVID-19 pandemic, during which online careers counselling rose in OECD countries (Holland and Mann, 2020[55]).

Studies suggest that the use of digital technology can help to make careers guidance more personalised and relevant (Moote and Archer, 2018[56]; Devlin et al., 2013[57]). However, while career websites have the capacity to connect young people to those outside of their immediate network, they should be allied with school-based counselling and wider forms of career support (see Vigurs, Everitt and Staunton (2017[58]) for an overview). Providing online tools for careers advice should complement, not substitute for, the role of qualified career guidance practitioners (Cedefop, 2018[59]). We will discuss this further in Section 5.

4.4.1. Learning from digital advice tools

The digital enhancement of career guidance provides new opportunities for research into the intermediate stages of young people's educational and occupational decision-making. Process data that can be retrieved from how users view information displayed on websites can reveal how individuals found information, evaluated options, and selected or excluded options. This allows for the observation of the decision-maker's behaviour at a granular level. Seeing what information is being sought and how it is being assimilated creates opportunities to assess the effectiveness of the website design and to make improvements (see Bruch and Feinberg (2017[32]) for an overview of new developments).

4.4.2. Serious games

A new development in this direction is the use of so-called "serious games", which are games with learning objectives that are used as cognitive tools for learning (Hummel et al., 2017[60]). Serious games can create more motivating and immersive ways for learners to develop career aspirations. A range of features, including interactive stories with intrinsically motivating environments and elements of challenge, control and fantasy, provide context and clear goal structures for problem-solving in the game environment. Serious games also offer a rich environment to examine learning and decision-making.

Outcomes of serious games include knowledge acquisition, as well as perceptual, cognitive and physiological development (Boyle et al., 2016[61]). Embedded formative assessments affect student learning either directly through feedback on personal progress, or indirectly – for example, through modifications of the learning or gaming environment. As part of the gaming experience, information is collected on the learner-game interactions to analyse progress towards learning outcomes. The gameplay integrates personalised feedback, support and scoring mechanisms that are embedded in unobtrusive ways in the game narrative (see Box 4.2).

Box 4.2. Youth@Work: A serious game for youth to develop career aspirations

Researchers in the United Kingdom developed Youth@Work, a serious game with five zones for young people, aged 13-19, to develop career aspirations.

- **Profiling** happens in Zones 1 and 2 where players go through a series of mini-games, in a given order, and the elicited information is used to calculate a "job compatibility" score. In Zone 1, players are in a circus and play three mini-games in which they select and rank five school subjects, five leisure activities and three career values. In Zone 2, players reflect about their skills and choose 15 skills and personal qualities that describe them best.
- **Career options** are presented in Zone 3, which is situated in a career library where players find information about 36 careers stored in career books, arranged in six shelves. In two-mini-games, players sort career books that have fallen out of the library. The aim is to build understanding of careers, jobs and typical tasks. After playing one round of the book-sorting game, players can open all six career books that were pre-selected based on their moves in Zones 1-2. Each of the six career books contains information about the job, profiles of workers, six top areas of skills required for the job, and the required level of education.
- **Seeking and reflecting about career advice**. In Zone 4, players learn to evaluate the quality of career advice they receive from four different people: a parent, career advisor, teacher and friend, whose advice can be good, poor or neutral. Players are asked to subsequently select three different problem scenarios (e.g. "should I stay on at school or leave as soon as I can?") and request advice from two different people.
- **Career advice**. In Zone 5, players receive proposals for eight jobs that would fit their personal profile created in Zones 1 and 2. Players see these jobs advertised on a job advertisement board with their individual job compatibility score next to it.

A pilot test with secondary school students from Iceland and Romania found that playing Youth@Work had a positive effect on career aspirations. In a randomised controlled trial, with half of the students playing an interactive game and the other half performing a paper-and-pencil version of the same activities, students were compared on career adaptability, career learning and career awareness scores before and after these interventions. Main results show that game players reported significantly better sense of control of, concern and confidence about careers than non-players. In focus groups during the design and development process, the highest-rated game features were: fun, competition, different levels, interactivity and compelling graphics.

Source: (Boyle et al., 2016[61]); (Hummel et al., 2017[60]).

5. A review of study choice websites in OECD countries

Effective support for education and career decision-making needs to be managed within an integrated system that includes influencers such as parents, teachers, peers and career guidance professionals, as well as information that helps young people make decisions between educational and occupational options. This means that information is only part of the decision-making package; and information will only be effective if it is structured in ways that reflect the nature of young people's decision-making processes.

The challenge facing governments is how to make information available to learners and their advisors in ways that meet their needs, that are easy to use, and that respect the complexities of decision-making behaviour, as discussed in Sections 2 and 3.

Websites can be an effective way to achieve this. They fulfil a double function of disseminating information *to* users and gathering information *from and about* users. We reviewed 34 study choice and career guidance websites in OECD Member countries that seek to orient and guide young people in their higher education choices (see Annex A for the list of websites reviewed). The purpose of this review was to draw attention to the range and variety of guidance websites in OECD countries and to present examples that have interesting tools, as a means of helping countries interested in improving their own guidance systems.

Results of the review are presented in this section. They should be treated as descriptive, rather than evaluative. Box 5.1 sets out the questions we posed in undertaking that review.

Box 5.1. Review of public study and career choice websites

Means and timeframe for information collection:

Questionnaire: June-September 2019 (see Annex A)

Interviews with experts in OECD Member countries: June 2019

Website review: March – May 2020. A total of 34 study and career choice websites were reviewed (see Annex A)

Key questions used in the review of websites:

1) Target audiences

- Who are the target audiences for the website?
- Does the website provide target-specific information; in particular, differential information for prospective students and their parents/caregivers, multilingual information, and information for users with visual impairment?

2) Personalisation and customisation of information display and interaction with users

- Does the website offer tools (e.g. tests, select & compare functions) that allow for personalisation of the display of labour market information?
- Can users create their own "portfolio" or "space" where they can save information about occupations/careers they are interested in, track their educational choices, be reminded about deadlines that they should not miss, etc.?
- Does the website have built-in games that simulate occupational choices and their implications?
- Does the website gather information on user experience?

- Does the website offer ways in which users can get in contact for further information (e.g. free-toll phone number, chat function, face-to-face meetings)?

3) Display of labour market information

- Does the website display labour market information associated with educational programmes?
- What are the sources of the labour market information (e.g. government education agency, national statistical agency, employer survey)?

4) Career orientation

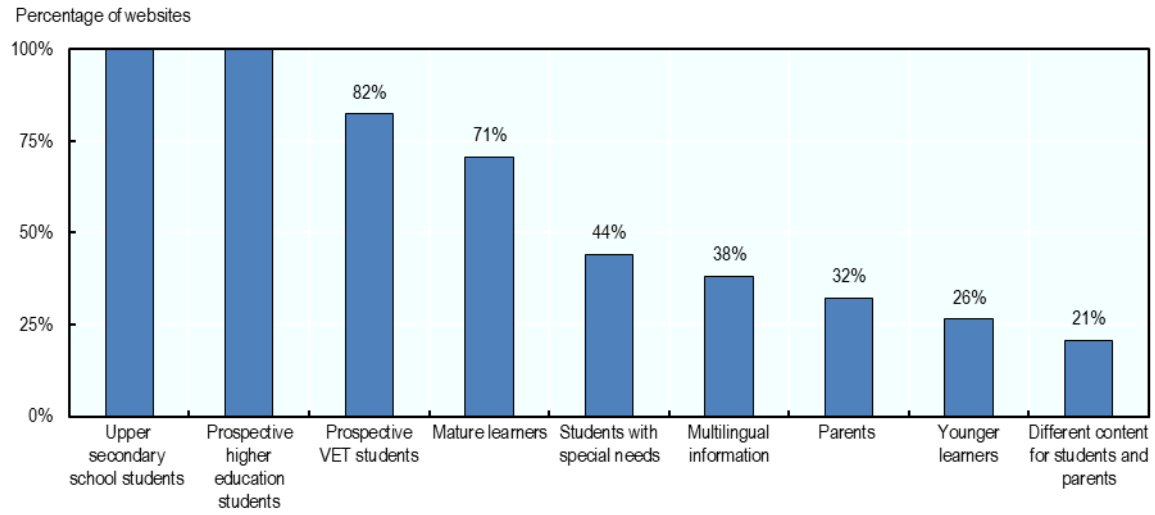
- Does the website provide support for users to understand and relate labour market information to their current situation?
- Does the website provide career guidance or indicate where users can get career guidance?

5.1. Target audiences for study choice websites

With the broadening of access to higher education across OECD countries, the student body has become more diversified. The student population has a wide range of socio-economic and demographic characteristics, abilities, needs and motivations. This entails a need to tailor information about post-secondary education options and career choices to the needs of different types of learners. This section looks at the range of target audiences for guidance information and how the reviewed websites in OECD countries cater to different audiences in their information tools.

The review results show that priority target groups of study and career choice websites are upper secondary students and prospective higher education students, while less than one-third of the reviewed websites offer information for younger learners (21%, 9 websites) and parents/caregivers (32%, 11). Seven websites (21%) provide different content for parents/caregivers and learners. Most (82%, 28) offer information for learners who wish to pursue a vocational education and training (VET) programme, while less targeted information was available for mature learners (71%, 24). Less than half (44%, 15) of the reviewed websites offered information for students with special needs, and just over one-third (38%, 13) information in multiple languages.

Figure 5.1. Review of study choice websites: Proportion of sites providing information for different target groups



Notes: Timeframe for information collection: Questionnaire: June-September 2019, Interviews: June 2019; Website review: March – May 2020. A total of 34 websites were reviewed.
Source: Information collection carried out by the OECD Higher Education Policy Team during 2019-20.

5.1.1. Information for younger learners

Websites that offer information about educational options and occupational pathways can be spaces where learners in lower secondary education (and their parents and caregivers), can explore pathways through higher levels of education towards careers.

Currently this is not widely practiced. Only nine of the reviewed websites provide information for students in elementary or lower secondary education, and those that do mostly seek to orient learners in their choice of programmes in secondary school.

For example, the website "*Utbildningsinfo"* in **Sweden** provides information about different types of schools and programmes according to their interests. Users also receive information about pathways from secondary into higher education. The web page allows users to compare different schools via indicators such as ratio of teachers to students, the percentage of students that continue to higher levels of education, national test scores, etc. This allows learners and their parents to develop a broader understanding of the educational options and pathways and make long-term plans, while developing skills in planning, comparing and deciding.

The presentation of information in websites targeted at younger learners needs to take account of the cognitive abilities of their audience. The website "*Onisep"* in **France** provides a space, "*Ce sera moi*" ("It will be me"), with a series of inspirational videos. In each episode, a student participant is introduced to their dream job by employees who work in the industry of interest. Employees perform job tasks on camera, giving students a glimpse of their real-life working environment. Website users can virtually explore a range of different careers – from astronaut, sign language interpreter to wind project manager – and broaden their understanding of typical tasks, work environment and other aspects of the job. By getting this information *via* a peer (the student participant), young learners can better relate the information to their own situation. The website also includes a short test based on the material from each episode, aiming to clarify and strengthen students' knowledge.

5.1.2. Information for parents

Parents and caregivers play an important role in study and career choices. They are role models and act as counsellors. Often they are decisive participants in the decision-making process (Huntington-Klein, 2017[62]). However, parents may lack information about educational paths and developments in the labour market. An additional challenge for parents is how to talk to their children about occupations, the labour market and the occupational implications of educational choices in ways that engage and make sense to students. Study choice websites can support parents and caregivers in this.

Currently, eleven of the reviewed websites offer a parents' sections. Websites that provide information for parents mostly provide guidance on the education system, information on pathways between different levels of education and advice on how to guide children through the decision-making process.

For example, the website "*Onisep"* in **France** includes information and videos clarifying all levels of education, potential pathways and types of qualifications. Such information can be particularly useful for parents who have no personal experience of higher education and therefore lack knowledge about options and pathways.

The website "Careers Portal" in **Ireland** provides parents and caregivers with questions that can serve as discussion openers. Examples include talking about their own ambitions when they were young, how they ended up in their current professions, how their career unfolded, or how adults helped them to find their way. Parents are also given advice on how and when to initiate conversations. In addition, the parents' section provides labour market information.

The website "*Nemzeti Pályaorientációs Portál"* in **Hungary** advises parents on how to guide their children through the education and career decision-making process. It includes guidance on parents' role and common pitfalls for parents guiding their own children. It helps parents to equip children with the skills needed to make independent decisions, rather than making decisions for them. The website also offers tests of interests and competencies, in versions for parents and children. These enable comparison of expectations and can help parents in learning which areas they should focus their advice on. Table 5.1 presents the main advice for parents from this website.

Table 5.1. Advice for parents and caregivers to support student choice, Hungary

	Elementary school students	Secondary school students	Higher education students
Parents' role	• Introduce the child to the world of professions • Observe what activities appeal to the child	• Provide emotional support through positive reinforcement • Give advice	• Give advice and support • Help the child to align personal desires with labour market reality
Activities	• Discuss children's interests with them • Perform role-plays related to a profession • Take a child to career events • Take a child to open days at high schools • Take the website test to discern perceptions of their child's interests and compare the results with their child's test results	• Initiate family discussions • Recommend community service or volunteering • Recommend visits to institutions' open days • Discuss employment opportunities with the child • Provide assistance with higher education enrolment procedures • Take the website test to discern perceptions about child's competencies and compare the results with their child's test results	• Recommend websites for job searching, employment services and recruitment agencies • Review CV and cover letter and give advice on how to improve • Recommend visits to job fairs • Mobilise personal contact network
Common mistakes parents make	• Biases towards child's abilities and interests • Biases towards specific professions and occupations	• Recommending a choice, rather than being indicative	• Accompanying child to interview • Write CV or cover letter for the child

Source: Adapted from the National Career Guidance Portal in Hungary (*Nemzeti Pályaorientációs Portál*) (n.d.[63]), https://palyaorientacio.munka.hu/ (accessed 11 February 2020).

5.1.3. Information about post-secondary vocational training pathways

Presenting positive and unbiased information on vocational education can improve participation in this type of post-secondary education. While traditionally vocational training is perceived as being more appropriate for students with average or below average academic ability, technical vocations have high skills requirements. Students in vocational tracks report higher course satisfaction and find their training more useful to their work than students who undertake academic courses (Callender and Wilkinson, 2013[64]).

28 of the reviewed websites (82%) offer information about vocational post-secondary education options. The website "*Berufsberatung*" in **Switzerland** presents educational pathways for occupations in 30 industries. Users can browse between different fields of interest and find which educational programmes will lead to the desired occupation/profession. The website lists educational institutions that offer the desired training for each occupation and links directly to their web pages.

The **Danish** education guidance web page's "Access card" is an interactive tool that helps students in choosing further educational paths, depending on the combination of subjects that they took in secondary education. Users can browse vocational and academic programmes that match their previous subject choice. For each programme, the website provides data on potential occupations and employment rates of graduates. The **Norwegian** web portal for education and occupations "*Utdanning*" presents paths to higher education, emphasising vocationally-oriented programmes, and providing information about the amount of practice and work-based parts of programmes.

Information about post-secondary education programmes ideally includes information about educational pathways between different types and levels of post-secondary education. Combined with information about the educational requirements of specific

occupations, this would help decision-makers to define the educational journey they need to get job they want.

5.1.4. Information for students enrolled in higher education programmes

As students in higher education programmes advance in their studies, questions about which specialisation to take, whether to change programmes or institution or to take a suspension will arise. Some students will be regretting their earlier choice of programme or field of study. However, this is when costs for changing subject are high whereas the marginal value of information is much higher before enrolment or in the early years of study when the cost of changing one's choice is lower. Hence, the proactive provision of labour market information to students in their initial years in higher education is an important priority in the design of an advice system.

Studies have shown that older students have more enduring interests than younger students and are thus more predisposed to seek labour market information (Betts, 1996[65]); (Bye, Pushkar and Conway, 2007[66]). The reviewed websites have a focus on helping students plan for finding work in an appropriate occupation. They provide information on the linkage between educational qualifications and occupations, postgraduate studies, types of employment, as well as labour market information – for instance, demand for occupations and the expected range of earnings. The website "*Diplomán túl*" in **Hungary** is using layered data (See Section 4). Its careers guidance module allows for institution-specific data display. Users can examine the labour market situation of graduates in terms of labour market status, income, most frequent jobs and sectors of employment.

Advice on how to change study programme and on the costs of this was difficult to find on the reviewed websites. Information on transfer routes from professional programmes to academic programmes and vice versa. A credit calculator for students to see whether and how the credits they have obtained can be transferred to another programme would be a highly useful feature.

Life circumstances pay require students to pause their studies. The website "Careers Portal" in **Ireland** offers information for students who are considering suspending their studies. For those who consider continuing their studies at the postgraduate level, the website offers information about postgraduate studies and study opportunities abroad.

5.1.5. Information for mature learners

Increased automation of jobs and the expansion of technologies in the workplace mean that more workers will need to update skills and knowledge. The number of adult learners in OECD countries has increased (OECD, 2020[67]; Eurostat, n.d.[68]).

Mature learners return to education for professional advancement, to help them change profession or to further their interests. For this group of students, further education needs to be flexible to cater for the learners' work and family commitments. Governments have an important role in informing mature learners about the requirements and outcomes of further education pathways. 24 of the websites reviewed provide information aimed at mature learners.

For example, the website "*Arbeitsagentur*" in **Germany** offers a step-by-step guide for mature learners, depending on the reason for their interests in returning to study. Adult learners can also assess their preparedness for further education based on their social and work behaviour, skills and interests. "*Opintopolku*" in **Finland** informs adult learners about the requirements, characteristics and benefits of blended learning, distance learning and independent study.

5.1.6. Information to help overcome the gender bias in occupational choices

Despite increasing enrolment rates of young women in higher education, differences in field of interest and profession choice persist. These differences are particularly present in STEM fields, even though female students may have better skills and aptitude for science-related subjects than their male counterparts in elementary and high school (ASPIRES, 2013[23]; OECD, 2019[5]).

Policy makers can use careers guidance websites to help female students broaden their options and preferences. To do so requires an understanding of what motivates young women in their career choices.

Empirical research suggests that girls graduating from secondary school are less likely to change their interest in a specific field of study once exposed to labour market information about other fields of study, compared to their male classmates (Long, Goldhaber and Huntington-Klein, 2015[69]; Bonilla, Bottan and Ham, 2015[70]). However, approaches that improve female students' confidence in their own abilities do result in changed attitudes. For example, stories of successful female workers in male-dominated industries can have a positive impact on female students' preferences (Breda et al., 2020[25]). Here, it should be noted that studies so far have shown that changes of preferences are mostly characteristic for high-SES female students. Therefore, it is important for policy makers to explore and learn what motivates different groups and tailor website content – and the display of role models (see Section 2) – accordingly.

The website "Careers" in **New Zealand** seeks to reverse gender bias in occupational choices. The website includes a test that helps students find a study field that matches their interests. The test is made up of questions that give an overview of occupational fields and include images of workers performing different tasks; these photos often present males performing occupations traditionally performed by women, and vice versa. This approach helps students relate to same-gender role models and see themselves in the work setting.

In a similar way, the website "*Onisep*" in **France** includes testimonies from workers, with women in traditionally male-dominated professions and vice versa. Articles describe their journeys, decision-making, education and career development.

5.1.7. Multilingual information

One of the first obstacles that immigrant students and parents face when receiving information is the language barrier. They are often reliant on externally-acquired information about the new environment, as they have less knowledge of the country where they currently live. Having weaker social network support, these learners may also be at risk of a difficult transition from education to work in occupations that depend on high levels of cultural and social capital.

Information that introduces immigrant students to the domestic educational system and labour market and support programmes can help immigrant students navigate the decision-making process. This also applies to websites. Native speakers of the language of a webpage will be more successful in finding and comprehending information (Fraillon et al., 2014[43]).

Thirteen of the websites under review include an option to access content in at least one additional language.[1] For example, the "*Arbetsformedlingen*" website in **Sweden** includes

[1] Another way to provide information in another language comes with website personalisation and customisation features. Some websites remember user's language preferences after their first access to the site by saving the preferences related to their IP address, or provide an instant option to change the language.

information in 17 languages (including for instance, Arabic, Dari, Romani and Somali). Users can read and listen to podcasts about the Swedish employment system in a range of languages and get tips on education and work in Sweden, writing job applications, and preparing for an interview.

The website "*Arbeitsagentur*" in **Germany** offers access to a "virtual welcome service", a programme that consolidates information about living and working in Germany. Users can contact counsellors via phone, video call and live chat. This website also presents successful stories of immigrant workers, and advice on what steps one should one take to achieve similar outcomes.

5.1.8. Information for students with special needs

Fifteen of the reviewed websites offer content for students with special needs. Most include alternative versions for different groups of students with disabilities, enabling functions such as enlarging letters, text-to-speech, instructions in sign language, speech recognition search, and access through screen-reader software.

The website "*Niid*" in **Latvia** presents a list of secondary education programmes for students with disabilities. The site also lists study programmes and higher education institutions that can accommodate students with different physical and psychological needs.

The website "Careers" in **Ireland** provides information about the DARE ("Disability Access Route to Education") programme that offers study places at higher education institutions for secondary school graduates for which disability has been the main reason for lack of secondary education success.

5.2. Personalisation and customisation of information display, and interaction with users

Each person has an information need that is personal. Information provision supports good decision-making when the information is broken into manageable pieces and delivered as and when the decision-maker needs it. Personalisation and customisation of information is what makes website technology a powerful tool in the task of delivering effective career guidance information.

Information on users interests, preferences and search/navigation habits can be gathered and then analysed by algorithms that can be used to find out what the user is likely to need from the website. This information can be used to personalise the user's experience of the website (Kristol, 2001[71]). Enabling site modifications and presenting different versions that suit users' profiles is an efficient way to attract and cater to different audiences.

Privacy of data and information should be a fundamental principle of website technology. To this end, websites need to present privacy policy as early as possible, before the user starts using the site, so they are informed about what they are getting involved in, and use appropriate language that is understandable for users.

5.2.1. Website personalisation

Personalisation is built from data on user behaviour, collected as the user navigates the website. Those data generate a user profile that takes account of individual and group characteristics. It also feeds into a process of optimisation that uses machine learning. The appearance, graphics, structure and content of the website are then adjusted to that person's predicted needs.

Websites gather data on user activity either through cookies (small data files that track activity) or other means. From cookies, website administrators learn how users navigate the site and they use these data to organise the website, for example by placing most popular information in places that are easier for users to find (Kristol, 2001[71]). The data captured are analysed using web analytic tools. Data are generated automatically once a user accesses the website and when users are sharing their opinions through surveys, focus groups and interviews.

Gathering information about website users covers user characteristics, such as age, gender, interest profile, interactions with website content and context, that is, information related to the device from which the user accesses the site, direct or redirected access, geo location, language and time. For example, the website "*UddannelsesGuiden*" in **Denmark** provides users with detailed information about the personal data that is collected. Users are also informed about when and how data is collected and the purpose of data collection. Table 5.2 provides an overview of the type of data collected and the collection methods employed by the reviewed websites.

Several of the reviewed websites also use structured user feedback and eye tracking to improve website design and features in addition to other data gathering. "*Studiekeuze123*" in **the Netherlands** regularly organises focus groups with website users and a wider group of learners and parents, "VDAB" in the Flemish Community of **Belgium** conducts regularly surveys and "*UddannelsesGuiden*" in **Denmark** involves website designers, content editors and representatives of schools and higher education institutions in strategic discussions about website architecture, design and features.

Table 5.2. Data used for website personalisation

	Type of data collected	Data collection method
User characteristics	Age Gender Interest profile	Log file analysis Surveys Social media data (e.g. if the personal profile log in is done through social media account) User (my) profile data
User interaction with the website	Internal search keywords Visitor's path (final destination, exit pages, etc.) Most-used features Time spent on the website Previous actions on the site (if user is returning visitor)	Web analytics Click analysis Eye tracking Heat map Mouse movement analysis Path tracing analysis
Contextual data: means, location and time of website access	Device from which the web page is approached Direct access or redirected from another web page Location Time of the day Language used	Log file analysis Focus groups Interviews Surveys

5.2.2. Website architecture and features

Accommodating the needs and abilities of users through a single web portal can be challenging. For this purpose, websites use design elements to build user-friendliness for different target groups, including multi-media elements, age-appropriate visuals, symbols and language expressions and content that is of interest for target groups and profiles. Both the website architecture and the content displayed on the landing page is important. Just like when reading a newspaper, users skim through the headlines and form a first

impression about the relevance of the information, and decide whether and how to proceed with their quest. This is the point where users acknowledge textual and linguistic structures, images and special features (e.g. pop-up windows).

Websites feed user data into algorithms that further assist several user groups in finding the appropriate content. This can be a way to progressively provide information, avoiding information overload. Hence, users can gradually develop a more substantial understanding of complex topics and questions such as earnings, taxes and contractual arrangements of work.

The website "*Berufsberatung"* in **Switzerland** asks users to self-assign to groups for which targeted information is presented (e.g. learner, parent). The website then directs them to targeted layers (webpages), which contain tailored information tailored. For instance, high school students are prompted to follow links to information on study areas and study programmes, higher education admission procedures, and tips about study at university and ways to start a career. Parents, on the other hand, are directed to pages that provide information about funding and the Swiss educational system. The website also allows quick access to saved searches, videos on occupations, training offers, FAQs and apprenticeship placements. Users can also re-order information blocks, putting the most important blocks on the top of the profile, so they can access them as soon as they open their personal profile.

By constructing a user's profile from gathered data, websites can give hints about matching programmes and professions. This approach is applied by the webpage "VDAB" in the **Flemish Community of Belgium**. The site matches a user's profile to selected job advertisements. The "match meter", is automatically activated once a user clicks on a vacancy. It is positioned in the lower left corner on those webpages that display information about job vacancies. The meter changes every time the user selects another job position indicating the individual match of the user with the selected vacancy.

Easy access to salient information is particularly important for decisions related to financial aid. Experimental studies have shown an increase in the number of aid applications and enrolment among prospective students who received targeted information about individual eligibility for financial aid, compared to students who general information about financial aid (Bettinger et al., 2009[72]). Several of the websites reviewed provide information about financial aid, but this information is often difficult to find. Students and parents/caregivers from lower socio-economic backgrounds can also benefit from web content that presents information about scholarships and financial aid. The "College Scorecard" website in the **United States** has a simple first page that offers users the option of searching for programmes and educational institutions, links to pages about alternative career paths and financial aid. Users can start the process of applying for financial aid with one click on the highlighted button immediately after accessing the site.

To avoid information overload, it is important to be able to pause and continue at a later point in time. The website "ManaVision" in **Japan** stores information about previously visited layers that contain information about professions and presents them every time a user visits another profession page, in a box next to the main text. This helps users to go back to pages they visited previously, skipping less relevant information.

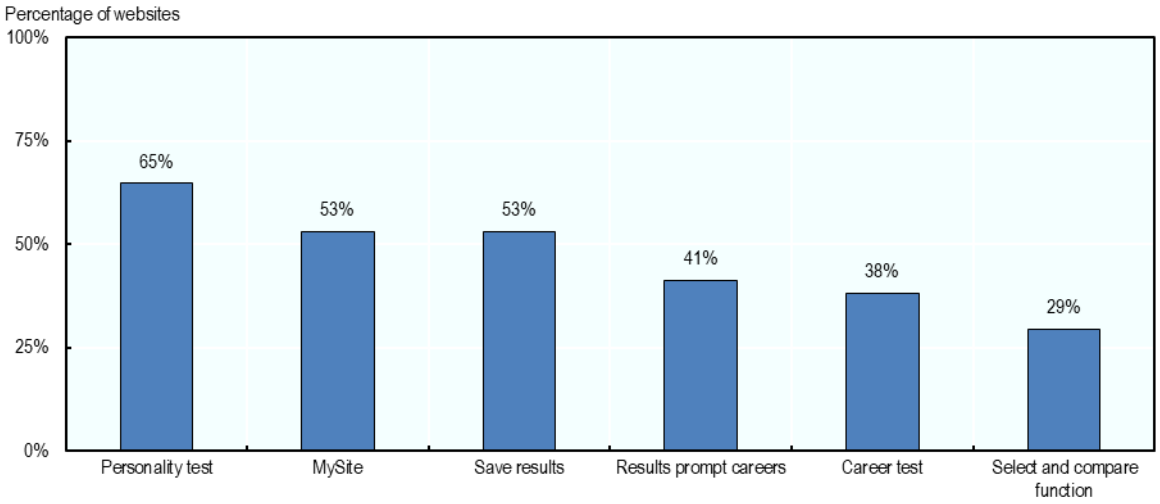
Allowing users to leave and resume their decision-making later is also a feature of "ComparEd" in **Australia** and "DiscoverUni" in the **United Kingdom**. Study programmes that a user has looked at are stored in a "compare basket" that allows users to compare the programmes, for instance looking at employment outcomes (see further examples below). The compare basket stores entries, allowing users to explore other content on the site and revisit the website without losing their place. The visibility of the compare basket reminds

users (who may get side-tracked) to complete tasks already started. Further examples of compare features are presented below.

5.2.3. Customisation and guidance features

Customisation is a way to make websites more interactive, giving an active role to the users rather than treating them as passive observers. Modification of the appearance and content of the site by giving the users access to tools for customisation can encourage them to spend more time browsing, reading and engaging with site's elements.

Figure 5.2. Review of study choice websites: Proportion of sites using customisation and guidance features



Notes: Timeframe for information collection: Questionnaire: June-September 2019, Interviews: June 2019; Website review: March – May 2020. A total of 34 websites were reviewed.
Source: Information collection carried out by the OECD Higher Education Policy Team during 2019-20.

Personal profile creation

A carefully designed website can be a one-stop place where users can plan their educational and occupational pathways. Allowing users to create a personal profile on a website allows them to store personally selected information relevant to their queries in one location. Users can also post information of interest and relevance and receive reminders for application deadlines for scholarships and enrolment or open days. These features make websites more interactive and engaging.

More than half (53%, 18 websites) of the websites reviewed offer either a MySite function or a save results option, allowing users to easily return to previously viewed educational programmes, occupational descriptions and job vacancies.

The website "VDAB" in the **Flemish Community of Belgium** presents users with a list of suggested job vacancies, based on information about their study history, competencies and other characteristics recorded when the user created the profile.

The websites "*AlmaLaurea*", "*AlmaGo*" and "*AlmaOrienta*" in **Italy** allow users to download a mobile application that serves as a virtual pocket for saving job offers and events related to career development. The app is synchronised with the user's personal profile on the website.

Customised search function, filters and compare function

When making choices about where and what to study, prospective students place importance on factors such as distance from home, how enjoyable a programme is, the reputation of a higher education institution, and costs and affordability. However, websites with very detailed information on study programmes or occupations can challenge a user's attention span and lead to information overload. Users can benefit from a function that allows them to narrow down search results using filters. The website "*Opintopolku*" in **Finland** offers six search parameters for educational programmes (language of instruction, location, field of study, teaching method, teaching time, and study mode). The National Career Guidance Portal "*NemzetiPályaorientációsPortál*" in **Hungary** includes filters that can be applied when searching for professions; for instance, skills and level of education required, and working mode.

Also useful is a function that allows users to compare items in one place, instead of navigating through several browser tabs. A comparison function should be as precise as possible, so users can gain a realistic comparison – for instance, broad comparisons (such as measuring labour market outcomes against national benchmarks) are less useful; comparing outcomes by institution (rather than by field and level of study) is less meaningful.

The reviewed websites differ on this. Currently, 10 websites (29%) offer a select-and-compare function. An example is "*Studiekeuze123*" in the **Netherlands**. The website allows for a detailed comparison between study programmes. Users can use eleven filters to narrow down their search. The user can click on the compare button to compare ten or more programmes at the same time, on a large number of measures. The compare function is part of an interactive 12-step guide. The guide mimics steps in the study and career decision process. For each step, there is tailored information, users reach steps only after having completed predecessor steps, and reminders allow users to pause and resume the process when appropriate. The completion of the 12-step process is enrolment in a post-secondary education degree.

Other websites designed for comparing study programmes include "ComparED" in **Australia**, "DiscoverUni" in the **United Kingdom**, and the "ScoreCard" website in the **United States**.

Use of avatars

The use of avatars – icons or figures that "represent" the user and can be customised according to user's preferences and self-image – can have a positive effect on learning. Customised animated avatars that mimic facial and body movements and "speak" like real-life humans have an impact on users, as they allow users to relate to the character (Cook et al., 2017[73]; Lin et al., 2017[74]). Allowing active involvement of the user in creating characters and involving them in computer simulations related to the worlds of study and work can encourage students to be more pro-active in choosing a programme or institution (Bailenson, 2012[75]).

At the time of our website review, only one website included an animated avatar. The website "KamInKako" in **Slovenia** includes an animated chatbot, named IZA, which allows users to ask questions about site navigation, the service's work and matters related to the professional world. Users can type or record queries.

This field offers opportunities for experimentation; possibilities include virtually experiencing professions through an avatar that performs activities related to the selected profession; or using avatars for presenting labour market concepts in language suitable for

the target group. Avatars could be enhanced progressively as the user visits the site, using machine learning to improve the relevance of the avatar to the user's profile.

Sharing information with others

Personal profiles that allow two-way communication in the form of a "tell-others" function can help users to reach out to peers and counsellors and involve parents in their decision-making. This tool can help students discuss, prepare applications together and support each other, establish private channels of communication with counsellors and share information about programmes and professions with their parents/caregivers. Only a few of the reviewed websites offer this function. None of the websites offered advanced messaging services that would connect personal profiles or relate to personal profiles in other social networks (e.g. LinkedIn).

Some websites have an interactive space where former students share their practical work experiences. For example, the website "*Aikos*" in **Latvia** has a forum section where users can post questions and propose topics for discussion. Each category layer has a list of questions posted by users, a pool of news related to the topic, and the option to check their profiles.

5.2.4. Interaction with users

As teenagers may often lack developed planning skills and self-discipline (see Section 2), websites need to remind and encourage users to act after using the website. Experimental research that used text messaging to "nudge" students towards submission of applications for financial aid for university had positive effect on post-secondary education students in the United States (Oreopoulos and Petronijevic, 2013[18]).

More than two-thirds of the webpages reviewed offer at least one means of communication between users and the agency responsible for the website's content. Most of the websites we reviewed use email as the means of communication. Other tools include phone and chat. A small number of websites gave the option of Skype conversations. Even though mobile phones are widely used to access websites by high school students, the reviewed websites rarely enable communication via popular instant messaging phone applications (e.g. WhatsApp, Viber).

As making educational and career decisions is a long-term process, website designers and managers should strive to keep users engaged with the website frequently. One of the most widespread approaches for promotion and dissemination of website content of the reviewed websites is using social media platforms. They enable career guidance facilities to be present in online spaces where students spend time. Some of the websites reviewed in this study are present on networks such as Facebook, Twitter, LinkedIn, YouTube and Instagram. Subscription to digital newsletters and receiving emails with a site's latest content is another way for websites to stay connected with users. Newsletters can be tailored to the needs of the user, through pre-subscription questionnaires where users identify the kind of information they would like to receive.

Users of the website "Prospects" in the **United Kingdom,** who open personal profiles at the site receive personalised emails that remind them about tasks that have not been completed and draws to their attention features that the user has not yet accessed. The website "*Arbeitsagentur*" in **German**y has a messaging function. Users can request to be notified by email, every time they receive message in their personal profile inbox.

5.3. Display of labour market information on career guidance websites

As discussed in Section 2, search priorities, habits and understanding of labour market information differ among learners and other users of study and career choice websites. Ideally, labour market information is structured and presented in ways that cater to these different groups. Local labour market information can help users understand the differences in regional and local economic contexts. Graduates' preferences may be affected by the need to shift location for work.

One-third of the reviewed websites provide a glossary of relevant terminology and concepts, such as type of salary (e.g. average or median, gross or net), type of employment (e.g. full-time or part-time) and type of skills. Defining key terminology in an easily accessible glossary can be very useful for students and graduates.

Table 5.3 gives an indicative list of the types of labour market information that the reviewed websites provide.

Table 5.3. Type of labour market information include in study choice websites

	Information on field of study in higher education	Profession/sector level information	System level information
Source of information	Graduate surveys; statistical office reports; government agency databases; research reports	Employer and employee surveys; graduate surveys; statistical office reports; government agency databases; research reports; employment services registers	Employer surveys; predictive analysis
Focus	**Programme and field of study**	**Profession**	**Labour market**
Examples	-Articulation between the study programme and the world of work (e.g. work-based learning, careers guidance) -Employment rates of graduates -Types of working arrangements of graduates -Unemployment rate of recent graduates -Starting salary, average salary, salary range by field of study, programme and profession -Average time until first job after graduation -Percentage of graduates who have a job related to their field of study -Industries in which graduates work -Relationship between earnings and field of study -Skills developed during studies and skills development on-the-job	*A. Profession description:* -Work activities -Educational pathways to the profession -Average working hours -Personal requirements (skills, personal traits and values; physical/psychological factors) -Working environment -Employment arrangements *B. Present and future trends:* -Salary range -Demand for new graduates -Projected job openings -Number of employees in the sector -Names of companies that work in the industry	-Highest-paying careers -Fastest-growing careers -Declining careers -Careers with largest employment -Long-term and immediate skills shortage lists -Business cycle sensitivity

Notes: Timeframe for information collection: Questionnaire: June-September 2019, Interviews: June 2019; Website review: March – May 2020. A total of 34 websites were reviewed.

5.3.1. Information on the relationship between education and earnings

Two-thirds of the websites reviewed in this research present information about how educational choices affect employment outcomes. In some cases, this information is collected through graduate surveys, while some websites use census data and others access the results of linked administrative data.

The websites mostly present earnings data by level and field of study, using national level data. This is a good starting point for initial exploration of fields of study. However, beneath that high-level view, there are differences between sub-fields that are masked by these broad averages. Likewise, different careers which are related to the same study field can have quite different earnings. And there are often large regional differences in outcomes. Users require a basic degree of financial literacy to understand information related to salary, taxation, monetary work benefits, social and health insurance, and to look ahead and make decisions that will have future personal financial repercussions. Some websites provide information that develops a deeper understanding of these topics and the dynamics of labour market and skills demand. For example, the "*Diplomán túl*" website in **Hungary** displays data about regional migration of graduates within the country and average earnings for entry-level jobs compared to the average regional income. The average income of graduates can be examined according to several aspects, such as study program, higher education institution and time since graduation. The website also provides data about the entrepreneurial activity of graduates.

The website "Careers" in **New Zealand** includes pages that explain aspects of labour market dynamics and trends. Topics cover questions such as the effect of education on income, factors that influence income, and the reasons for skills shortages. Webpages further link to other websites that offer more detailed information about each of the topics.

These are promising developments to advance the role of websites as virtual learning spaces for implementing practical aspects of economics and business-related subjects in secondary education and beyond.

5.3.2. Exploring professions and occupations

Drawing from previous experiences of their parents' vocations, media, role models, peers' inclinations and the context they live in, students come to career decision-making with preconceptions and preferences. However, often these understandings will be incomplete or biased. Therefore, websites need to provide publicly available, accurate information about types of professions.

The reviewed websites provide two types information on occupations and professions: information about the nature of a profession; and assessments of its labour market standing (i.e. salaries, demand for workers, likely trends). Two-thirds of the reviewed websites present information that describes professions through the types of tasks performed by employees, dominant industries, and the educational qualifications required to enter the profession.

An example of a rich career exploration tool is the "Job Compass", which is part of the website *Utdanning* in **Norway**, and the website *Utbildningsinfo* in **Sweden**. The "Job Compass" is an interactive tool that allows students to explore future careers in a visual interface that shows relationships between and proximity of different occupations. Pop-up windows provide easy-to-read information about the job and its educational requirements.

The Key Information for Students tool created by "Careers" **New Zealand**, and a complementary tool, Occupational Outlook assesses 100 occupations, giving data on training needs, training costs, completion rates, earnings in the first three years in the job, data on vacancies and forecasts of the medium-term need for that occupation. The website "ManaVision" in **Japan** includes employee satisfaction rankings and presents a list of the ten highest-ranked professions.

Some websites include broader information and offer deeper insights into different jobs. The website "*Arbeitsagentur*" in **Germany** allows users to search professions by field of study, but allows users to delve into sub-fields. The website "Prospects" in the **United**

Kingdom offers users a search function for vacancies that distinguishes between work experience placements, graduate schemes that allow graduates to gain practical experience, internships, apprenticeships, and volunteering. Users can narrow down results by occupational sector, salary range or region.

Several websites include videos, mainly containing interviews with employees and employers. "CareersPortal" in **Ireland** includes a large repository of videos. Videos are either interviews, presentations by a student or an employee or real footage of work activities. A serial called "A Day in the Life" follows individuals from different professions during their day. The podcast "Future You" on the website "Prospects" in the **United Kingdom** aims to help recent graduates in making choices (e.g. navigating life after university, getting the skills that are demanded on the labour market, becoming an entrepreneur, etc.). The podcast can be heard on the website or downloaded from popular streaming platforms.

5.3.3. Information about entry-level jobs and work arrangements

Information about paths into employment after graduation can help students plan for finding work, smooth their transition from education to the labour market, and feel less insecure during the process of searching for jobs. Information about entry salary and the range of work arrangements – for example, full-time work, casual work, freelance work, self-employment, etc. – is important.

The website "*UddannelsesGuiden*" in **Denmark** informs prospective students about the types of work that graduates take up. This site includes the tool "Educational Zoom", which enables users to compare educational programmes based on a range of indicators and to compare a programme's performance with national averages. The website "*Alma Laurea*" in **Italy** also presents what types of employment agreements graduates have one year after completing their studies.

The website "Careers" in **New Zealand,** explains the range of work arrangements and provides information about working hours and the advantages/disadvantages of each type of work arrangement and links to websites with more detailed information.

Some of the websites present information about time to find work after graduation (for instance, the **Slovak Republic** website "*Uplatnenie*"), how new graduates typically find their first job (the **Danish** website "*UddannelsesGuiden*"), and the linkage between the level and field of study of higher education and the profession of the first job (the **Netherlands** website "*Studiekeuze123*").

"*Utdanning*" in **Norway** displays information about graduates' salaries by profession, broken down by such variables as gender, age, sector and work arrangements. This information helps graduates to depict what a typical entry-level job looks like and which positions typically require advanced work experience.

5.3.4. Information about emerging developments in the labour market

One of the most important aspects of future labour market developments is the likelihood that an occupation will be affected by emerging technologies – artificial intelligence and automation. Digital technologies and the shift towards a greener economy are creating new careers. In jobs where technology is advancing quickly, new entrants and incumbent workers will need to be able to demonstrate openness to and skills in working with advanced digital technology (see above section on mature learners). Currently, few of the reviewed websites provide information about emerging labour market developments.

On the website "VDAB" in the **Flemish Community of Belgium**, users can learn which professions face a shortage of suitably qualified applicants, based on statistical information about job vacancies from the employment service and qualitative information from employers and employment service experts. The page explains what causes a shortage of applicants – whether through a shortage of appropriate graduates, a shortage of appropriate programmes, a lack of skills among candidates, or the existence of working conditions that deter people from applying.

The website "*Arbeitsagentur*" in **Germany** briefs users about trends and new developments in the labour market by occupation with a focus on digitalisation. The website also provides information about which professions and occupations are expected to change in the near future. This website also explains the reasons behind the change trends. The website "MyNextMove" in the **United States** provides information about which professions are expected to see a decline in employment in the upcoming ten years. It also includes a "green badge" for every profession that is expected to see an increase in numbers as a result of the new and emerging types of work. Other future-focused information centres on opportunities to transfer skills from one field of study/occupation to other fields.

"*Studiekeuze123*" in **the Netherlands** informs users whether demand for graduates per field of study is sensitive to changes in the economy, and provides an estimate on possibilities to switch occupations. Estimates are expressed by a four-step qualitative rating from "very high" to "very low".

5.4. Careers orientation and guidance

As discussed in Section 4, effective careers guidance is timely, motivating and targeted to the needs of individual learners. Online counselling can help to achieve this. It gives more time for both the student and counsellor to think through questions and come up with well-structured answers. Online tools are cost-efficient and practical when school counsellors are unavailable or when there is absence of career centres.

Most of the reviewed websites offer careers counselling either on the website or via referral to other services. The reviewed websites offer different features, which can be grouped into mediated and unmediated services, such as virtual or in-person one-on-one sessions with a career counsellor (mediated), and personality tests and self-reflection exercises (unmediated). Referral to in-person career orientation and counselling combines online and in-person services. Table 5.4 provides an overview of career orientation and counselling services offered by study choice websites.

Table 5.4. Overview of career orientation and counselling services offered by the reviewed websites

	Mediated career orientation and counselling services	Unmediated career orientation and counselling services
Online	• One-on-one session with career counsellor (e.g. via Skype, chat) • Group session with career counsellor (e.g. via Skype, chat) • Online forum with other participants and discussion moderator • Step-by-step guide to stimulate continuity	• Personality test • Self-reflection exercises • Discussion fora
In-person	• One-on-one session with counsellor/teacher • Group session with counsellor/teacher • Presentations in schools (by employers, institutions, role models, etc.) • Open Days • Career fairs • Work-based learning and Internships	• Self-reflection exercises and personality and career orientation without follow-up

Notes: Timeframe for information collection: Questionnaire: June-September 2019, Interviews: June 2019; Website review: March – May 2020. A total of 34 websites were reviewed.

5.4.1. Efforts to raise attractiveness and take-up of careers guidance

Websites can assist students and parents to find a counsellor with a suitable profile. A common feature of the reviewed websites is information about public career and employment centres that offer orientation and counselling services. Most of the reviewed websites provide information about local career centres. For instance, "*NaestaSkref*" in **Iceland** presents an interactive map of lifelong learning centres, which employ study and career counsellors. The National Career Guidance Portal "*NemzetiPályaorientációsPortál*" in **Hungary** allows users to employ filters to narrow down the list of counsellors. Search parameters include location, qualification (e.g. psychologist, teacher, educator, social worker), specialisation field (e.g. high school, higher education, adult education, professional training), type of counselling (individual, group, distance), target group and years of experience. Similarly, the website "*Minukarjäär*" in **Estonia** includes profiles of counsellors who work in career centres. Students, parents and guardians can read more about counsellors' skills, interests, approaches and language skills. Users are presented with the contact details of the career counsellor.

The reviewed websites employ different approaches to encourage users to get some form of careers guidance. For example, the National Career Guidance Portal "*NemzetiPályaorientációsPortál*" in **Hungary** informs students that counselling is done in several steps, each aimed at three main goals: acknowledging one's ambitions, strengths and weaknesses; exploring professions, occupations and their characteristics; and learning about the labour market. The website suggests questions that helps students set their own expectations and formulate questions to ask a counsellor.

"*Minukarjaar*" in **Estonia** also includes promotional videos to encourage students to use careers guidance services. One of the videos contains a 10-minute presentation by a career counsellor and encourages young people to try out counselling services. This approach is directed especially to students who are uncertain or insecure about seeking help in relation to their educational choices and career. The website "*UddannelsesGuiden*" in **Denmark** offers flexible chat hours to make sure that incompatible time schedules are not the main barrier to careers guidance.

The website "18plus" in **Austria** links students with different types of counselling such as: individual and group counselling about educational and career choices; encounters with business representatives; and psychological counselling related to study and life problems. The website gives students a list of preparatory questions motivating the user to reflect on career planning or improvement (e.g. clarifying expectations, identification of influencers in study and career decision-making, comparison of programmes and professions, etc.). The documents can be used in mediated counselling. The website "*Opintopolku*" in **Finland** offers a catalogue of questions to help users start thinking about their career choices and to prepare for career counselling.

"*Utbildningsinfo*" in **Sweden** helps users build a network of advisors from all walks of life. The website offers users a CV builder, a task-planning feature with email reminders, and personal contact book where users can store contacts of people they wish to consult with about their study and career choices (friends, family, teachers, counsellors, etc.). In this way, users build a career network that can help them to seek study advice, find work, and develop ideas. The contact book can be downloaded and shared with others.

Study choice websites can also serve as information platforms for career counsellors. The labour market is constantly changing as technological change and the economic cycle affect certain sectors, causing change in the demand for some professions. The website "Careers" in **New Zealand** offers a rich repository of guides and materials for career guidance aimed at teachers, school and career counsellors. The counsellors' section on the website includes self-improvement exercises and content and links to counsellors' networks that support discussion groups on social media.

5.4.2. Tools for self-reflection

Students need to be aware of personal qualities and characteristics they should possess, or develop for a chosen career. Some websites include personality and skills tests, step-by-step guidance, and self-reflective exercises to help users to learn about their own characteristics and personalities and enables them to envision the potential of those traits alongside their educational achievement. For example, the website "*Opintopolku*" in **Finland** asks users questions about their perceived strengths, skills, occupational preferences and what kind of decisions they have to make. The aim is to help users understand the different stages of career choice, and to reflect about them using different ways of expression, such as writing, drawing and conversations with family, friends, teachers and career counsellors.

Personality tests are also used to reduce the number of choice options according to the user profile. Personality tests can be used to reduce the number of choice options according to the user's profile. To be effective in aiding the decision-making process, these tests should not be too time consuming and keep users motivated to complete them.

Close to two-thirds of the reviewed websites (65%, 22 websites) offer these tests (Figure 5.2 above). Types of tests and the use to which results are put vary. Some explore students' interests and cognitive abilities, while others explore their career inclinations and career values.

The **US** website "MyNextMove" includes five categories of personal requirements. Firstly, it highlights the theoretical knowledge one should have, aiding the user to relate the profession with field of study. Secondly, it discusses the skills that one should have. Thirdly, it discusses ability. Fourthly, it presents personal traits that are important for work. Finally, it informs users about computer skills necessary for the job. It also allows users to search for educational programmes related to a profession and includes a personality test

to help users to learn what aspects of their personality fit the profession and what features they should work on.

For example, the website "*Naestaskref*" in **Iceland** offers users a test that helps them identify professions that match their interests and qualifications. The test is based on evaluation of each of 112 types of professions and work-related tasks. The results show the affinity the participant has towards each of six fields of interest, and suggests professions that combine different fields of interest. Similarly, the website "Careers" in **New Zealand** offers a test that explores a user's preferences for different fields, activities and interests. The results gives a list of professions that fit the user's preferences, which can be filtered by industry and qualification. The website "Prospects" in the **United Kingdom** offers a job-matching test. The results display the user's personality type and their personality traits. Each personality type is matched with a list of professions.

Few of the websites reviewed include tests that are tailored to the stage a user is at in the decision-making process. An example is "NIID" in **Latvia**, which offers several tests: an interest test that explores student's affinity for professional field; a subject test that assesses student's talents in different subjects; a diversity test; a personality test; a career value test that explores what the individual considers important in their work place; and a work environment test that explores preferences for working conditions. Results pages explain aspects of user's dispositions, and give a list of professions that fit user's profile.

The aims and outcomes of tests need to be explained and visible to users. In the tests offered on the website "*Utdanning*" in **Norway,** each question section contains a short video that discusses the themes of the questions. If users have queries, there is a help function adjacent to the questions. Students are advised to discuss results with a counsellor.

6. Conclusion

Good decision-making in educational and occupational choices is critical for individual well-being and a well-functioning labour market. Good decisions mean that individuals end up in careers that are appropriate to their aptitudes and to their interests. Good decisions are also essential if an economy and a labour market are to optimise the use of the human capital available in a country's population.

We have learned from research in the behavioural sciences, especially behavioural economics, that when young people face complex intertemporal decisions, they introduce bias – present bias (they place more weight on the immediate cost than the future benefit), confirmation bias (they take account of what "people like me" are prone to do and decide in accordance with their preconceptions). And they are inattentive – they do not engage with the complexity of the decision.

This poses challenges to governments. To improve young people's career decision-making, governments need to provide support for decision-making – through guidance, in schools and post-secondary education, and through the provision of robust information. But the provision of information needs to be structured to reflect the nature of the decision-making process. This means that information, ideally, should be personalised, trustworthy, meaningful to the decision-maker and provided as needed (but no more).

Labour market information is highly relevant for educational choices. We have seen from the review of 34 public study choice and career guidance websites that web-based technologies offer opportunities to tailor and structure labour market information in ways that are appropriate to young people.

6.1. Examples of good practice in the use of website technology

We focused our review of public study choice and career guidance websites on four areas: tailoring of information; features to help personalisation and customisation of information; display of labour market information; and digital enhancement of careers guidance. In this concluding section we refer to some particularly interesting approaches.

6.1.1. Tailoring information to different user groups

We reviewed how public websites tailor information to different audiences in response to a more diversified student body in higher education. For example, "*Arbeitsagentur*" (Germany) offers a step-by-step guide for mature learners on their return to higher education, and "*Opintopolku*" (Finland) informs about the requirements and characteristics of blended learning, distance learning and independent study. "*Nemzeti Pályaorientációs Portál*" (Hungary) provides guidance for on parents and caregivers on how to avoid common pitfalls and "Careers Portal" (Ireland) offers a list of questions that that can serve as discussion opener. "*Arbetsformedlingen*" (Sweden) includes information in 17 languages, and "*Arbeitsagentur*" (Germany) has a "virtual welcome service" that encourages refugees to contact counsellors via phone, video call and live chat. "*Niid*" (Latvia) and "Careers" (Ireland) present information about education programmes for students with special needs.

When tailoring information to meet the needs of different target groups, it is important to take into consideration the differences within groups based on socio-economic status, gender and general life circumstances. This can influence the timeliness, accuracy and relevance of information, but also the ways in which users act on the information.

6.1.2. Personalisation and customisation of information

The challenge that governments face is how to make information available to learners and their advisors in ways that meet their needs, that are easy to use, and that respect the complexities of decision-making behaviour. Websites can be an effective way to achieve this, as they fulfil a double function of disseminating information *to* users and gathering information *from and about* users. Personalisation and customisation of information make website technology a powerful tool to provide information in a way that breaks big decisions down into smaller choice sets. Website developers should keep in mind that information processing skills are still under development during teenage years. Website design can help users to not get trapped in information overload, for example by directing users to relevant content, including filters, search and compare functions, the option to save information and previously visited pages. Privacy of data and information should also be a fundamental principle of website technology.

"*Berufsberatung*" (Switzerland) directs users to site layers that contain relevant information and allows users to re-order information blocks according to their priority interests. "Studiekeuze123" (the Netherlands) has pop-up windows that suggest further activities related to the content currently being viewed. "*AlmaLaurea*" and "*AlmaGo*" (Italy) offer users a mobile application that serves as a virtual pocket for saving job offers and events related to career development.

In particular, the option to create a personal profile allows users to store personally selected information relevant to their queries in one location, apply filters and benefit from reminder features for application deadlines for scholarships and enrolment or open days. "Studiekeuze123" (the Netherlands), for example allows for a detailed comparison between study programmes with a 12-step guided tour that includes reminders. "*KamInKako*"

(Slovenia) includes an animated chatbot that assists users. Websites can also stimulate user's participation in the creation of content, for example through two-way communication among users. "*Aikos*" (Latvia) has a forum section where users can post questions and propose topics for discussion among peers.

6.1.3. Display of labour market information

Labour market information in career choice is more than information about earnings and employment prospects. Expectations about future levels of earnings influence students in their field of study choice. Information about graduate employment rates, occupational pathways from entry-level jobs to higher-level jobs, the skills requirements for these jobs, time to employment, typical jobs and work arrangements provides useful orientation in study and career choice. Holistic presentation of labour market information includes both qualitative and quantitative information, gathered from multiple reliable sources.

"*Uplatnenie*" (Slovak Republic) provides information about how long it takes on average for graduates to enter employment. "Job Compass", an interactive tool on "*Utdanning*"(Norway) and "Utbildningsinfo" (Sweden) allows students to explore professions and occupations pathways. It shows which professions are related, how to transition between professions and related educational requirements. "Careers" (New Zealand) provides information that cover questions such as the effect of education on income, factors that influence income, and the reasons for skills shortages. "VDAB" (Belgium) shows which professions face shortages with an explanation whether this is due to a shortage of appropriate graduates, a shortage of appropriate programmes, a lack of skills among candidates, or the existence of working conditions that deter people from applying. "MyNextMove" (US) includes a "green badge" for every profession that is expected to see an increase in numbers as a result of the new and emerging types of work. "*Studiekeuze123*" in the Netherlands informs users whether demand for graduates per field of study is sensitive to changes in the economy, and gives an estimate on possibilities to switch occupations. Estimates are expressed by a four-step qualitative rating from "very high" to "very low".

"*ManaVision*" (Japan) includes employee satisfaction rankings and presents a list of the ten highest-ranked professions, and "*Diplomán túl*" (Hungary) displays data about regional migration of graduates within the country and average earnings for entry-level jobs compared to the average regional income.

Effective provision of labour market information in study and career choice takes into account that different types of learners have different needs for information. Labour market information that is capable of showcasing the different realities of individuals in the world of work can widen the career horizon of students. Labour market information needs to be accompanied by explanations and educative components that aid students to understand complex terminology and labour market dynamics. Inclusion of glossaries, wage calculators, age-appropriate educational videos and materials are helpful features of websites.

Digitalisation is changing the world of work in fundamental ways. A remaining question for policy makers is how to generate useful knowledge about emerging developments with the current labour market information system.

6.1.4. Digital enhancement of careers guidance

Online tools can complement the role of qualified career guidance practitioners. For example, websites can assist students and parents to find a counsellor with a suitable profile. To this end, "*NaestaSkref*" (Iceland) offers interactive map to locate study and

career counsellors, and "*Minukarjäär*" (Estonia) includes profiles of counsellors and promotional videos to encourage students to use guidance services. The websites "18plus" (Austria) and "*Opintopolku*" (Finland) provide a catalogue of questions to help users start thinking about their career choices and to prepare for career counselling. Career websites can also be places where counsellors get information about the labour market and get ideas on how to communicate such topics in an interactive and age-appropriate manner.

Students need to be aware of personal qualities and characteristics they should possess, or develop for a chosen education pathway and related occupations. To this end, websites can include personality and skills tests, step-by-step guidance, and self-reflective exercises. For example, "NIID" (Latvia) offers various tests which are tailored to the stage a user is at in the decision-making process, and "*Utdanning*" (Norway) explains aims and outcomes of tests with the help of short videos and a help function adjacent to the questions. A relatively new development – not practiced by reviewed websites at the time of review – is the use of serious games to create more motivating and immersive ways for learners to experience "work". The few studies that exist suggest that these games motivate players to access labour market information related to occupational pathways, for example, videos that present jobs in terms of their typical tasks and working conditions.

6.2. Success factors in the design of effective information policy levers

Two key findings with relevance for policy makers emerge from our review of study and career choice websites. First, information will only be effective if timely, relevant and structured in ways that reflect the nature of young people's decision-making processes. Websites, thus, need intelligent design and tools that can assess the stage of decision-making the user is at and then feed information in ways that give the user control, in quantities that reflect the young person's capacity to use that information.

Second, effective support for decision-making needs to be managed within an integrated system that includes influencers such as parents, teachers, peers and careers guidance professionals. For a website to be effective it needs to be an integral part of a wider support system. A website with sophisticated features – no matter how good – may sit within a system that lacks other necessary supports, while a website that has only modest functionality may be sitting alongside a range of other decision support tools that, collectively, may constitute an effective guidance system.

Website technology creates opportunities for research into the way young people make educational and occupational decisions. It allows for observation of the decision-maker's behaviour at a granular level. It is an important new line of work that draws on insights from cognitive science and decision theory to examine how choice processes play out in social environments.

The review of websites provides actionable advice for policy makers. Building on the work of Hume and Heal (2016[31])[2], we recommend the following eight success factors in the design of effective information policy levers:

1. **Understand** where **young people** are coming from, their personal characteristics, and their context in the moment that they are accessing the information.

[2] When the UK Department for Education looked to use its Longitudinal Educational Outcomes (LEO) data in career advice, it commissioned research on how to do so effectively (Taylor, 2016[11]). As part of that project, Hume and Heal (2016[31]) from the Behavioural Insights Team, reviewed the literature on careers guidance and conducted interviews with school students and with careers advice professionals. Their research led to eight principles to underpin good careers advice and information.

2. **Provide trustworthy information** that is up to date, impartial and does not push particular paths.
3. **Provide information** only when relevant and needed.
4. **Personalise information** that allows young people to picture themselves in a career while taking into account that what makes a career appealing differs from person to person.
5. **Give young people agency** and control over the decision-making process by explaining concepts and data, and be transparent about how personalisation and customisation of websites work.
6. **Break big decisions down into smaller choice sets** helps to avoid information overload while avoiding to omit options, which would otherwise limit a person's choice set.
7. **Signpost actions**: provide details of what is the next step in the decision-making process, and what are the implications.
8. **Help influencers** (parents, teachers, career counsellors) give meaningful advice to young people.

Annex A. Websites reviewed and questionnaire

Table A.1. List of websites reviewed

Country	Institution	Website	URL	Name in English	Source of information
Australia	Government	AUS_ComparED	https://www.compared.edu.au/compare/institutions		Website
Austria	Federal Ministry of Education, Science and Research	AUT_18plus Berufs- und Studienchecker	https://www.18plus.at	18plus Information for Occupational and Educational Choices	Interview
Austria	The Department of Labour Market Research and Career Information	AUT_Karrierekompass	https://www.karrierekompass.at/	Career Compass	Website
Flemish Community of Belgium	Employment and Vocational Training Service	BEL_VDAB	https://www.vdab.be/	Everything to Train You	Questionnaire
Denmark	Ministry of Children and Education	DEN_UddannelsesGuiden	https://www.ug.dk/	Education Guide	Questionnaire
Estonia	Estonian Unemployment Insurance Fund	EST_Minukarjäär	https://www.minukarjaar.ee/	My Career	Website
Finland	National Board of Education	FIN_Opintopolku	https://opintopolku.fi/wp/fi/	My Study Path	Website
France	Centre-Inffo	FRA_Orientation pour tous	https://www.orientation-pour-tous.fr/	Guidance for All	Website
France	Ministry of National Education and Youth and the Ministry of Higher Education, Research and Innovation	FRA_Onisep	http://www.onisep.fr/	Onisep - Information on Occupations and Education	Website
Germany	Federal Employment Agency	DEU_Arbeitsagentur	https://www.arbeitsagentur.de/bildung	School, Apprenticeship, Higher Education	Website
Greece	National Organisation for the Certification of Qualifications & Vocational Guidance	GRC_TeensGate	www.eoppep.gr/teens		Website
Hungary	National Career Guidance Portal	HUN_Nemzeti Pályaorientációs Portál	https://palyaorientacio.munka.hu/	National Career Guidance Portal	Website

Hungary	Educational Authority		https://www.diplomantul.hu/	IAD Career Guidance Module	Questionnaire
Iceland	Education Center for Business	ISL_Í Námi og Starfi	https://naestaskref.is/	In Practice and Employment	Questionnaire
Ireland	Ministry for Education and Science	IRL_CareersPortal	https://careersportal.ie/		Questionnaire
Italy	Interuniversity Consortium	ITA_AlmaLaurea	https://www.almalaurea.it/; https://www.almalaurea.it/lau/orient o	A Bridge between University and the World of Work	Questionnaire
Japan	Benesse Corporation	JPN_ManaVision	https://manabi.benesse.ne.jp/		Questionnaire
Latvia	State Education Development Agency	LVA_NIID.LV	http://www.niid.lv/	National Database of Educational Opportunities	Website
Lithuania	Ministry of Education, Science and Sports	LTU_Aikos	https://www.aikos.smm.lt	Open Guidance System	Website
Netherlands	Ministry of Education, Culture and Science	NLD_Studiekeuze123	https://www.studiekeuze123.nl/	Study Choice 123	Questionnaire/ Interview
New Zealand	Tertiary Education Commission	Careers New Zealand	https://www.careers.govt.nz/		Website
Norway	Ministry of Education and Research	NOR_Utdanning	https://utdanning.no	Education	Website
Portugal	Ministry of Education and Research	PRT_Infocursos	http://infocursos.mec.pt/	Information about courses	Website
Slovak Republic	Ministry of Education, Science, Research and Sport	SVK_PortalVS	https://www.portalvs.sk/sk/	Study Programmes Portal	Website
Slovak Republic	Ministry of Labour, Social Affairs and Family	SVK_Uplatnenie	https://www.uplatnenie.sk		Website
Slovenia	Employment Service of Slovenia	SVN_KamInKako	https://www.ess.gov.si/ncips/kam-in-kako	Where and How	Questionnaire
Spain	Ministry of Education and Professional Training	ESP_TodoFP	http://todofp.es/inicio.html	Career Guidance and Information Portal	Website
Sweden	National Agency for Education	SWE_Utbildningsinfo	http://www.utbildningsinfo.se	Educational Information	Questionnaire
Sweden	Swedish Public Employment Service	SWE_Arbetsformedlin gen	https://arbetsformedlingen.se/		Website
Switzerland	Center for Vocational	CHE_Berufsberatung	https://www.berufsberatung.ch/	Academic and Career	Questionnaire

	Training - portal for career, study and career advice			Information Portal	
United Kingdom	operated by the UK higher education funding and regulatory bodies	GBR_DiscoverUni	https://discoveruni.org.uk/		Website
United Kingdom	Joint Information Systems Committee	GBR_Prospects	https://www.prospects.ac.uk/		Website
United States	US Department of Education	USA_Scorecard	https://collegescorecard.ed.gov/		Website
United States	National Center for O*NET Development	USA_O*NetMyNextMove	https://www.mynextmove.org/		Interview

Notes: Timeframe for information collection: Questionnaire: June-September 2019, Interviews: June 2019; Website review: March – May 2020. A total of 34 websites were reviewed.

Table A.2. Questionnaire

	Questions
About the website	When was the website created? Why was the website created?
Labour market information	Does the website display labour market information associated with educational programmes? What are the sources of the labour market information (e.g. statistical office, employer survey)? Are there plans to display (more) labour market information associated with educational programmes in the future?
Personalisation of labour market information to user needs	Does the website personalise the display of labour market information to match it with the interests and needs of users? Does the website offer tools (e.g. tests, select & compare functions) that allow for personalisation of the display of labour market information? Does the website have built-in games that simulate occupational choices and their implications? Are there plans to personalise the display of information to match with the interests and needs profile of users? Does the website provide labour market information that is targeted at parents? Are there plans to provide labour market information targeted at parents?
Supporting users to make sense of labour market information	Does the website provide support for users to understand and relate labour market information to their current situation? Are there plans to introduce/further develop this kind of support? Can users create their own "portfolio" or "space" where they can save information about occupations/careers they are interested in, track their educational choice, get reminded about deadlines that they should not miss, etc.? Are there plans to introduce/further develop such a portfolio/space? Does the website provide career guidance or indicate where users can get career guidance? Are there plans to introduce/further develop the provision of or the signposting to career guidance on the website?
Interaction with users	Does the website offer ways in which users can get in contact for further information (e.g. free-toll phone number, chat function, face-to-face meetings)? Are there plans to introduce/further develop this? Does the website gather information on user experience? Is there accompanying research on the website and its use? Are there plans to commence/further develop accompanying research?
Promoting the use of the website	Are there websites or other channels that direct users to the website (e.g. the website is listed in the "useful links" of the Ministry of Education, public employment service, posters/advertisements)? Are there plans to further promote the use of the website?

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