# AI to Support Neurodivergent Learners in Vocational Education and Training

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**Please cite this publication as:**
OECD (2026), *AI to Support Neurodivergent Learners in Vocational Education and Training*, OECD Publishing, Paris, https://doi.org/10.1787/718d7522-en.

ISBN 978-92-64-69301-2 (print)
ISBN 978-92-64-51331-0 (PDF)
ISBN 978-92-64-81631-2 (HTML)

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# Foreword

Vocational Education and Training (VET) can be an important setting for neuroinclusive learning, given its diverse mix of learners with varied skills and work experience, and its focus on practical, job-specific and employability skills. Yet, neurodivergent learners can face challenges in VET – as in general education – such as a lack of tailored instruction, insufficient support in learning and work environments, and stigma around neurodivergences. AI (Artificial Intelligence) and other advanced technologies could address some of these challenges and support neurodivergent learners in VET settings, including in work-based learning and apprenticeships, and the school-to-work transition.

Drawing on insights from over 50 stakeholder interviews, this report highlights this potential, identifies barriers and risks, and provides policy guidelines to help governments seize the potential of AI and other advanced technologies to support neurodivergent learners in VET. It builds on earlier work by the OECD on *Using AI to support people with disability in the labour market*, *Opportunities and drawbacks of using artificial intelligence for training*, and *Building Future-Ready Vocational Education and Training Systems*.

The report was prepared by Marguerita Lane, under the supervision of Stijn Broecke and Glenda Quintini (OECD Directorate for Employment, Labour and Social Affairs), with valuable inputs from Ricardo Espinoza, Marieke Vandeweyer, Malgorzata Kuczera, Patricio Ruedi and Iván Bornacelly (OECD Centre for Skills). The report benefitted from helpful comments from Mark Pearson and Valerie Kornis (OECD Directorate for Employment, Labour and Social Affairs), El Iza Mohamedou (OECD Centre for Skills), Lucie Cerna, Cecilia Mezzanotte and Samo Varsik (OECD Directorate for Education and Skills), Valerie Frey (OECD Directorate for Public Governance), and Melina Tasiovasilis and Jan Varchola (European Commission Directorate-General for Employment, Social Affairs and Inclusion). Thanks to Natalie Corry for providing publication support.

This report would not have been possible without the interviewees who generously lent their time and expertise in speaking to the OECD for this project. The interviewers (Patricio Ruedi, Iván Bornacelly and Marguerita Lane) would like to express their sincere gratitude to the interviewees listed in Annex A as well as those interviewees who wished to remain anonymous. Thanks to Emma Linsenmayer (OECD Directorate for Education and Skills) who helped test the topic guide. Thanks to the stakeholders engaged in VET and disability policy who participated in a workshop on “AI and other advanced technologies to support neurodivergent VET learners” on 24 October 2025 whose feedback helped refine the guidelines.

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# Executive summary

Young neurodivergent people – including those with Autism Spectrum Disorder (ASD), Attention-Deficit/Hyperactivity Disorder (ADHD), and learning disabilities, such as dyslexia, dyscalculia and dysgraphia – can struggle to complete compulsory education and to transition to further and higher education and training and eventually the labour market. Persistent gaps in educational and employment outcomes signal that neurodiverse talents are undervalued and underused, imposing costs to society in the form of lost productivity, higher welfare spending and worse health outcomes. More inclusive education, both general and vocational, and workplaces could help bridge these gaps.

Vocational Education and Training (VET) can be an important setting for neuroinclusive learning, given its diverse mix of learners with varied skills and work experience, and its focus on practical, job-specific and employability skills. Yet neurodivergent learners can face challenges in VET – as in general education – such as a lack of tailored instruction, insufficient support in learning and work environments, and stigma around neurodivergences.

AI (Artificial Intelligence) and other advanced technologies could help address some of these challenges and support neurodivergent learners in VET settings, including in work-based learning and apprenticeships, and the school-to-work transition. Drawing on insights from over 50 stakeholder interviews, this report highlights this potential but also identifies barriers and ethical, pedagogical and societal risks associated with these technologies.

AI and other advanced technologies have the potential to make VET more adaptive, accessible, and inclusive for neurodivergent learners:

- **AI-enabled adaptivity** allows instruction and feedback to be tailored to diverse needs, learning styles and abilities, helping bridge gaps in participation and performance. Some teachers already use generative AI to generate multiple versions of an exercise sheet for different learner profiles.
- **Extended Reality (XR)** technologies enable immersive, practice-oriented learning in safe environments that facilitate repetition and rehearsal and can accommodate individual needs. Virtual Reality (VR) and Augmented Reality (AR) allow learners to rehearse task sequences or challenging interactions (such as job interviews), build confidence and manage anxiety before moving to real-life practice in the context of work-based learning.
- **VET's accessibility** is enhanced through tools such as text-to-speech and speech-to-text. These "profoundly impactful" tools enable each learner to engage with the curriculum in ways that align with their strengths. These tools are not new but they have become more accurate and fluid due to recent improvements in LLMs and in cloud computing.
- Other tools seek to **directly address difficulties** that neurodivergent learners may face, such as with executive function. Neurodivergent VET learners already use simple technologies, such as digital to-do lists and video and written reminders, to assist with planning, time management, working memory and attention, while interviewees highlighted the possibility to leverage the latest advances in AR, wearables and AI's ability to identify patterns (e.g. in behaviour or in stress responses), to personalise these tools to users and their learning and work environments.
- **Transitions from VET to employment** can become smoother if neurodivergent learners leverage new technologies such as generative AI to build independence, confidence and other employability

skills, and to assist with the job application process (e.g. CVs and interview practice) and in the job itself. Additionally, the widespread use of generative AI at work could help remove some of the stigma associated with use of writing assistance tools.

However, a range of barriers prevent the full potential of these technologies from being realised. Learners, teachers (including trainers) and employers can be overwhelmed by the growing number of available tools, while VET teachers often lack the capacity and/or support to fully engage with new technologies. While desk- and computer-based work can easily accommodate new tools, the diversity of work and learning environments within VET presents practical and technical challenges. Affordability remains a significant barrier, limiting access and driving inequalities. At the same time, many promising technologies fail to reach the market, and those that do often do not align with the real needs of VET institutions, teachers and learners, and do not integrate well with existing systems.

The use of AI and other advanced technologies to support neurodivergent learners in VET also raises a range of ethical, pedagogical and societal risks, many of which also apply to general education system and to neurotypical learners.

- **Data privacy risks** could be amplified for neurodivergent VET learners due to the sensitivity and nature of data collected and uncertainties about who is responsible when data is shared between schools, training centres and employers. At the same time, an overly prescriptive approach to these risks could leave neurodivergent VET learners deprived of useful tools.
- **Biases are replicated and perpetuated** when AI systems are trained on historical data, which lack diversity and imbed assumptions about what counts as a “normal” body or mind. Discrimination against neurodivergent individuals is a serious harm that can result when biased systems make decisions that directly affect an individual’s livelihood and ability to transition to the labour market, for instance in AI-enabled recruitment tools.
- **Overreliance on these technologies** could hinder the development of fundamental skills, such as critical thinking, writing and communication skills. Interactions with generative AI chatbots could leave learners unprepared for real-life interactions with colleagues who provide nuanced, ambiguous or challenging answers.
- **Concerns about AI-assisted cheating** could put the legitimate use of assistive technologies (particularly writing assistance tools) at risk. The question of how to fairly assess students in light of the latest generative AI tools is as yet unresolved within VET and the wider education system.
- **Socio-emotional risks** associated with generative AI chatbots and robots are not yet fully understood, not least for neurodivergent learners. One risk is that emotional attachments to robots or generative AI chatbots could expose learners to harmful content and interactions.

The following policy guidelines can help governments seize the potential of AI and other advanced technologies to support neurodivergent learners in VET:

- Apply existing frameworks governing accessibility, disability rights, AI, data privacy etc.
- Prepare and support VET teachers with skills and knowledge to use AI and other advanced technologies to support neurodivergent learners
- Help neurodivergent learners, VET institutions and employers to navigate the many AI and other advanced technologies available.
- Fund assistive technologies and support the assistive technology ecosystem.
- Encourage developers to improve the accessibility of AI and other advanced technologies and to better align them with the needs of neurodivergent learners.
- Use AI and other advanced technologies to help achieve more responsive, inclusive and innovative VET systems.

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# 1 Introduction

This report discusses how AI (Artificial Intelligence) and other advanced technologies can support neurodivergent learners in Vocational Education and Training (VET) settings, including work-based learning and apprenticeships, and the school-to-work transition. It explores the use of these technologies by learners with Autism Spectrum Disorder (ASD), learners with Attention-Deficit/Hyperactivity Disorder (ADHD), and learners with learning disabilities, such as dyslexia, dyscalculia and dysgraphia, as well as use by teachers and trainers in catering for these learners and promoting neuroinclusive learning.

## The current challenges for neurodivergent learners in VET and the transition to work

### *There are clear and persistent gaps in educational and employment outcomes associated with neurodivergence*

Young neurodivergent people (see Box 1.1) can face a struggle to complete compulsory education and to transition to further and higher education and training and eventually the labour market. Persistent gaps in educational and employment outcomes signal that neurodiverse talents are undervalued and underused, imposing costs to society in the form of lost productivity, higher welfare spending and worse health outcomes (Mezzanotte and Calvel, 2023[1]). More inclusive education, both general and vocational, and workplaces could help bridge these gaps.

#### Box 1.1. Who are the neurodivergent learners discussed in this report?

Neurodiversity describes natural variations in how people think, learn, perceive the world, interact, and process information (EARN[2]). The term emerged within advocacy in the late 1990s with the purpose of shifting discourse beyond purely medical terms (Singer[3]). As a result, there is no single, standardised definition of the term. While the term “neurodivergent” can refer to a wide range of people, this study focusses primarily on learners with Autism Spectrum Disorder (ASD); learners with Attention-Deficit/Hyperactivity Disorder (ADHD); and learners with learning disabilities, such as dyslexia, dyscalculia and dysgraphia. These neurodivergences are relevant for this study because they are often diagnosed during an individual’s school years. Additionally, the focus on a narrower set of neurodivergences helps narrow the scope of technologies under consideration so that their benefits and risks can be better understood. The benefits and risks are not necessarily unique to learners with these neurodivergences; many of them also apply to learners with other neurodivergences and/or disabilities and to neurotypical learners.

Neurodivergence is a risk factor for early school leaving. Box 1.2 explains how ASD, ADHD, dyslexia, dyscalculia and dysgraphia can affect learning, while the next section outlines some challenges faced by neurodivergent learners in VET. Compared to their peers without ADHD, learners with ADHD have (Mezzanotte, 2020[4]): school attendance challenges and higher risk of dropping out of high school (Barbaresi, 2007[5]); higher risk of being expelled or suspended (LeFever, 2001[6]); and, lower likelihood of completing post-secondary education (DuPaul, 2009[7]). Students with learning disabilities are twice as likely to leave school before completing their education compared to their peers (Kaur, 2017[8]). Early school leaving adds to the challenges young people with disability face in the transition to the labour market (OECD, 2022[9]), and puts them at a disadvantage for the many key life outcomes linked to education, such as physical and mental health, social mobility, criminality, and social cohesion and political participation (Mezzanotte, 2022[10]).

### Box 1.2. How neurodivergences can affect learning

**Autism Spectrum Disorder** (ASD) comprises a diverse group of conditions related to brain development, characterised by some degree of difficulty with social interaction and communication, as well as atypical patterns of activities and behaviours (World Health Organization, 2025[11]). The needs and abilities of individuals with ASD vary and can evolve over time. Depending on where the conditions lie along the spectrum, some people can live independently while others deal with severe impairments and require care and support their whole life. The World Health Organization estimates that around 1 in 127 people has ASD. Impairments in communication, social interactions and cognition can significantly disrupt daily functioning, developmental progress and educational and social outcomes for these children (World Health Organization, 2013[12]).

**Attention-Deficit/Hyperactivity Disorder** (ADHD) is a neurodevelopmental disorder characterised by a persistent pattern of inattention and/or hyperactivity-impulsivity lasting at least six months, with onset in early to mid-childhood, and a severity that exceeds typical age-related variations, significantly impairing academic, occupational or social functioning (Mezzanotte, 2020[4]; World Health Organisation, 2025[13]). Post-2000 estimates of prevalence of ADHD diagnosis in children range from 3.2% in Sweden to 10.5% in the United States (Martin et al., 2025[14]) ADHD impacts students' ability to function effectively in school, which can be partly explained by factors such as challenges in executive functions, like working memory, planning, organising and shifting between tasks (Wiener and Daniels, 2015[15]).

Individuals with **dyslexia** experience difficulties in learning academic skills related to reading and writing, such as word reading accuracy, reading fluency and reading comprehension (World Health Organisation, 2025[13]). It is estimated that around 15% to 20% of the world population have some of the symptoms of dyslexia (International Dyslexia Association, 2020[16]). Dyslexia can negatively impact individuals' educational and professional outcomes, as well as their emotional well-being, self-esteem, and social relationships and behaviours (Livingston, Siegel and Ribary, 2018[17]).

Individuals with **dysgraphia** experience difficulties in learning academic skills related to writing, such as spelling accuracy, grammar and punctuation accuracy and the organisation and coherence of ideas in writing (World Health Organisation, 2025[13]). It is unclear what proportion of the population experiences dysgraphia due to variability in diagnostic criteria, methodologies and awareness (Biotteau, 2019[18]). Dysgraphia can also create barriers for the acquisition of other skills and performance of core activities (e.g. note-taking, self-expression), as well as negatively impact students' self-esteem and in turn, their academic success (Danna, Puyjarinet and Jolly, 2023[19]; Asselborn, Chapatte and Dillenbourg, 2020[20]).

Individuals with **dyscalculia** experience difficulties in learning academic skills related to mathematics or arithmetic, such as number sense, memorisation of number facts, and accurate mathematical

reasoning (World Health Organisation, 2025[13]). Dyscalculia is estimated to impact 5 to 7% of the population, frequently coexists with dyslexia and can be associated with long-term academic difficulties (Kaplan and Meylani, 2025[21]).

Source: Extracts from the OECD working paper (Linsenmayer, 2025[22]), "Leveraging artificial intelligence to support students with special education needs", https://doi.org/10.1787/1e3dffa9-en.

Indeed, there is an employment gap for neurodivergent adults. One survey in the United States suggests that adults with ADHD are 25 percentage points (p.p.) (34% vs. 59%) less likely to be employed full-time than adults without ADHD, while a longitudinal study also in the United States associates childhood ADHD with an employment gap of 10 to 14 p.p. in adulthood, an earnings reduction of approximately 33%, and greater likelihood (by 15 p.p.) of receiving social assistance (Mezzanotte, 2020[4]; Biederman and Faraone, 2006[23]; Fletcher, 2013[24]). Some studies from the United Kingdom and the United States suggest that between 50 and 75% of adults with ASD are unemployed (Jacob et al., 2015[25]).

Comparison across disability type or neurotype is challenging given high rates of co-occurrence and the large heterogeneity even among people with the same disability or neurodivergence. However, 2022/23 official statistics for people with disability in the United Kingdom (Department for Work and Pensions[26]) suggest that autism and learning difficulties are associated with worse employment outcomes on average than many other health conditions. The employment rate is 31% among people whose main health condition is autism and the same rate for people whose main health condition is severe or specific learning difficulties. These employment rates are the lowest of all the health conditions included in the data, including for example, difficulty hearing (75%), musculoskeletal conditions (58%) and mental health conditions (44%). In the same direction, recent research found that neurodivergent people in the United Kingdom are about twice as likely to be in precarious work and more than ten times as likely to be in temporary employment as neurotypical peers (Branicki et al., 2024[27]).

While the educational attainment of people with disability has improved considerably in the past 15 years, so has the educational attainment of people without disability, with the result that people with disability remain at the same relative disadvantage. This is a main finding of the 2022 OECD report on "Disability, Work and Inclusion: Mainstreaming in All Policies and Practices" (OECD[9]), which tracks how disability education and employment gaps have evolved over the previous 15 years, although the statistics presented within are not disaggregated by neurodivergence or type of disability. Young people with disability are more likely to leave school early (i.e. without attaining any more than a lower secondary education). In the EU27, 22.5% of persons with disabilities aged 18 to 24 left school early in 2022, compared to 8.4% of young persons without disabilities (Eurostat[28]). 28.5% of young persons with disabilities (aged 15 to 29) in the EU27 were neither in employment nor in education and training (NEET) in 2022 (Eurostat[29]), compared to 10.8% for those without disabilities. Similar statistics are seen across the OECD (OECD, 2022[9]), although post-COVID data are not available for all countries.

The persistent disability gap in educational outcomes is mirrored in employment outcomes, with the employment rate of people with disability remaining much lower than that of people without disability. The average disability employment gap across EU member states was 22 p.p. in 2023 while people with disability were approximately twice as likely to be unemployed than people without disability in 2022 (15.1% vs. 7.6%) (Grammenos, 2024[30]). Gaps of similar magnitude are seen across the OECD. In 2022, the OECD (2022[9]) noted that these gaps in employment outcomes had remained stubbornly stable in most countries since 2008. However, once employed, the likelihood of a job-to-job change is relatively similar for people with disability and people without disability. This indicates the potential for people with disability and/or with neurodivergences to thrive in the labour market once they overcome initial barriers to entry.

### *Vocational Education and Training (VET) is an important setting for neuroinclusive learning*

VET plays an important role in providing inclusive opportunities for all learners, including those who are neurodivergent, while maintaining its broader mission as a pathway of excellence and innovation (see Box 1.3 for a definition of VET). VET serves a diverse mix of learners with varied skills and work experience, with programmes offered at different levels reflecting the complexity of knowledge and skills involved (OECD, 2023[31]). VET can be an appealing option for some neurodivergent students, especially those who prefer practical learning over academic studies, due to the focus on practical skills tailored to specific industries and job roles. Furthermore, modern VET increasingly covers advanced cognitive, digital, and social competences, accommodating learners with many different interests. Work-based learning and the focus on employability skills can support learners' transitions to the labour market and help close the employment gaps associated with neurodivergence. Vocational programmes can also provide opportunities to develop transferable competences, including literacy and numeracy skills, preparing learners for more advanced education and making them adaptable in a changing labour market.

Where countries see high participation of neurodivergent learners in VET programmes, this can be for the reasons above but can also reflect broader systemic factors, such as guidance and selection practices,[1] or the limited capacity of general education to accommodate diverse learning needs. In the EU, many young people with disability choose or are oriented towards VET (Waddington, 2018[32]).[2] In some OECD countries, VET accommodates learners with weaker literacy and numeracy skills than those in general education (OECD, 2023[31]). The OECD has highlighted the importance of inclusion in *all* areas of the education system[3] – general and vocational, but also at primary and lower-secondary level – while also acknowledging the key role that VET can play in preventing early school leaving for young people with disabilities and/or with neurodivergences (2022[9]; 2023[33]).

However, the high participation of neurodivergent learners in VET programmes in some countries should not be understood as intrinsic to VET itself. Modern VET systems are increasingly designed as pathways of excellence, combining advanced technical, digital and transversal competences across a wide range of sectors, including high-demand and technology-intensive fields. Framing VET primarily as an option for learners who struggle in academic settings risks overlooking its evolving role as a key pillar of innovation, inclusion and high performance in education and work.

Regardless of what specific factors lead neurodivergent learners to VET, it remains an important setting for neuroinclusive education, playing a key role in keeping neurodivergent learners in education and preparing them for further and higher education and eventually the labour market.

### Box 1.3. What is Vocational Education and Training (VET)?

VET encompasses a broad range of learning pathways that equip individuals with practical and job-specific skills. In line with the definition used in the European Union Council Recommendation on Vocational Education and Training (VET) for sustainable competitiveness, social fairness and resilience (24 November 2020), VET refers to education and training which aims to equip young people and adults with knowledge, skills and competences required in particular occupations or, more broadly, in the labour market. Usually VET programmes have work-based components, whereby students receive training in companies. VET programmes may also aim to develop transferable competences, including literacy and numeracy skills. Successful completion of VET programmes often leads to labour market-relevant vocational qualifications (e.g. certificate, diploma or title) that, in many systems, are acknowledged as occupationally oriented by the relevant national authorities and demonstrating that the individual has acquired competences to specific standards. VET programmes may also provide an entry to higher-level education and training.

VET plays a crucial role in OECD education systems, as it provides an alternative to general academic education, enhances employability, facilitates the transition from school to work and to further education and training, and meets labour market demand for skilled workers (OECD, 2023[31]).

Although VET structures vary significantly across OECD countries, upper secondary education (ISCED 3) remains the most common level for VET programmes. On average, VET programmes account for 42% of upper secondary students in OECD countries, reaching 70% in some countries such as the Czech Republic (Czechia) and Slovenia (OECD, 2023[31]). In some OECD countries, there is no distinct upper secondary VET pathway, with vocational learning instead integrated into general education or offered mainly at post-secondary level. Many countries offer VET at post-secondary non-tertiary (ISCED 4) and short-cycle tertiary (ISCED 5) levels. Some, such as Germany and Switzerland, have also developed higher-level VET pathways, where vocational qualifications are equivalent to bachelor's and master's degrees (ISCED 6 and above).

Work-based learning (WBL) is an essential element of VET and benefits both students and employers. Workplace environments provide access to up-to-date equipment and expose students to industry-relevant techniques and technologies, which may not always be available in school settings. Countries with strong WBL components in their VET systems see improved labour market outcomes for graduates, including shorter job search durations, lower unemployment risks, and higher wages (OECD, 2023[31]; European Commission, 2025[34]). Moreover, WBL enhances the alignment between vocational education and labour market needs, as employers play a direct role in shaping training opportunities.

Apprenticeships represent a structured form of WBL, combining classroom-based instruction with substantial on-the-job training typically representing at least 50% of the programme duration. Students can alternate between school-based learning and paid employment in a company (dual model) or receive it in blocks. For example, in Norway, students spend the first two years in school and the last two with the company. Countries with well-established apprenticeship models, such as Germany and Switzerland, demonstrate how these programmes can effectively facilitate the transition from education to employment.

### *Yet neurodivergent learners can face challenges in VET*

Neurodivergent learners can face challenges in VET, just as in general education. Health issues, including learning difficulties, have been identified as a factor in leaving VET early (Cedefop, 2016[35]). Other studies have highlighted barriers that people with disability face in accessing and completing VET programmes, such as the lack of tailored learning environments, insufficient support during the transition from education to employment (Eurofound, 2021[36]) and insufficient provision of ICT equipment (Waddington, 2018[32]) – many of which would also apply to neurodivergent learners.

Stakeholders interviewed for the study made the point that VET and education more generally are not built for neurodiversity and that no single method of instruction works for everyone. Veronika Kaska (Deputy Director, Ashtangu Vocational Rehabilitation Centre) and Colm McNamee (Cuimsiú Employability Mentor) said that education systems are designed for the "average student", a profile which does not match any real student, not least those with neurodivergences. Teaching materials are not typically tailored according to diverse needs, according to Elisabetta Bertola (AAC Specialist Co-ordinator, Irisbond). Despite VET being more oriented towards practical and job-specific skills, many of the challenges for neurodivergent learners in VET are the same as in other educational environments, according to Alisdair Gurling, a researcher at Wonderlab, Monash University. For instance, even trainee electricians may need to study large safety manuals.

Teachers (including trainers) in VET face a substantial challenge in trying to accommodate all needs. This challenge is likely even greater in VET than in general education, due to the diversity of learners' skills and work experience. Nwanneka Udeka, a speech-language pathologist, highlighted that many teachers are not trained to understand diverse needs and feel that they do not have the time needed to accommodate all needs in the class. According to Thomas Köhler, who delivers VET teacher training in Germany, it is very difficult for any VET teacher to detect and cater for all needs in a typical class of 20 students. In the most recent OECD Teaching and Learning International Survey (TALIS) of (non-VET and VET) teachers at ISCED 2 and ISCED 3 levels, approximately a third of teachers report that modifying lessons for students with special education needs is a source of stress (OECD, 2024[37]). In the VET context, these challenges are often compounded by the fact that the responsibility for learner support is split between education and training providers and employers.

Like other learning environments, VET learning environments may lack the psychological safety that enables learners to explore and share ideas, especially neurodivergent learners who may experience behavioural or mental health issues (i.e. beyond the learning difficulties identified in Box 1.2). Veronika Kaska explained that neurodivergences are often intertwined with behavioural or mental health issues such as anxiety and social withdrawal, previous trauma, underdeveloped socio-emotional skills, difficulty expressing themselves and needing support in mastering basic everyday tasks. Other interviewees pointed out that neurodivergent learners may enter VET with low confidence and internalised stigma due to prior experiences in general education, bullying or exclusion.

### *Neurodivergent learners can face challenges in the transition to the labour market*

Interviewees described a labour market wherein the full potential of neurodiverse talents is not realised, as evidenced by the employment gaps discussed previously in this chapter. Neil Milliken (Vice President, Global Head of Accessibility & Digital Inclusion at Atos) made the point that neurodivergent people can be extremely high performing employees given the right environment and the right support. Illustrating this point, Hiren Shukla (Global and Americas Neuro-Diverse Center of Excellence Leader, EY) cited an EY survey which suggests that in inclusive environments, neurodivergent professionals' proficiency in key skills is much higher: 31% increase in proficiency for cybersecurity skills, 20% for AI and big data skills, and 10% in strengths such as resilience, flexibility and agility (EY, 2025[38]).

Misconceptions and a lack of awareness around neurodiversity can lead employers to focus on perceived limitations rather than strengths and can place neurodivergent VET learners at a disadvantage in securing work-based learning placements. Some employers approach neurodiversity and disability with trepidation, according to Nicole Lonican, whose organisation, FIT, runs an employee network aimed at capacity building to help employers support workers with disability and neurodivergences and to provide workplaces that are accessible for everybody. She noted how employers are sometimes reluctant to engage with the topic due to a lack of awareness of how to include neurodivergent talents or a fear of offending neurodivergent employees. Francesc Sistach (CEO, Specialisterne Global) described how these fears and lack of awareness can lead companies to ultimately view neurodiversity as a cost rather than an opportunity.

Issues around diagnosis and disclosure prevent neurodivergent employees from accessing the supports they need, which could include in-work grants as well as access to assistive technologies, including AI and other advanced technologies. In Ireland, Nicole Lonican (Cuimsiú Programme Co-ordinator, FIT) explained that long public waiting lists and the cost of private evaluations make diagnosis a privileged process, so requiring formal proof can exclude those most in need. She described how lower confidence, internalised stigma and lower self-advocacy among neurodivergent individuals are not only barriers to entry to the job market but also prevent employees from being open about their needs and seeking support. Many interviewees highlighted that stigma around neurodivergence discourages disclosure among job candidates and employees.

Many of the same issues around diagnosis and disclosure also affect VET. Interviewees described a feedback loop between VET and the labour market. Delayed diagnosis and insufficient support in VET can lead to challenging transitions to work, according to Francesc Sistach. At the same time, efforts to align VET with labour market needs mean that when employers do not prioritise inclusion, the VET system does not prioritise it either, according to Pierre Dillenbourg, Professor at the Computer-Human Interaction Lab for Learning & Instruction at the Swiss Federal Institute of Technology (EPFL).

## Methodology

This report summarises the key findings of over 50 stakeholder interviews as well as a workshop bringing together additional stakeholders engaged in VET and disability policy. Stakeholder interviews lasted up to an hour and were conducted virtually. Interviewers followed a semi-structured approach, using a topic guide with pre-determined open questions (see Annex B) but with the flexibility to select and order questions according to interviewees' profiles and expertise, and to ask follow-up questions to elicit more in-depth insights. A targeted (but not representative) approach was used to recruit interviewees with experience and knowledge of the use of AI and other advanced technologies to support neurodiversity in VET who could deliver rich and diverse insights on this topic. Potential interviewees were identified through a literature review, professional contacts and desk research (identifying participants of relevant conferences, members of research or policy groups) and by other interviewees' referrals. Interviewees included: developers of relevant technologies, VET teachers and trainers, vocational rehabilitation practitioners, academics, employers, disability rights advocates and policymakers. A list of the participants who agreed to be named is provided in Annex A. Interviewees naturally included some individuals who described themselves as neurodivergent and were able to contribute valuable insights based on their own experiences in education and at work. Due to challenges with outreach, no interviews were secured with current VET learners.

As a synthesis of information collected through interviews, this report has the following limitations. While efforts were made to seek diverse profiles and viewpoints, it is likely that the framing of the study around the use of AI and other advanced technologies to support neurodivergent learners in VET attracted participants who believe in this potential at the expense of participants who are sceptical of this potential

or less engaged with this topic whose views are not as well represented in this report. Nevertheless all interviewees answered questions about both the risks associated with these technologies and the potential. Interviewees were asked about the use of these technologies in the context of VET and the transition to work, but many of the same tools can equally be applied in general education. In some cases, interviewees described technologies that they saw as having potential future application in VET but are not in use. Where possible, an effort has been made throughout the text to distinguish between potential and actual use. While individuals with the same neurodivergence can have different support needs and levels of independence (particularly with ASD, as discussed in Box 1.2), most of the technologies mentioned in this report are used by the neurodivergent VET learner themself, with the result that learners with less independence and potentially more complex needs are not as well represented in this report.

A repository of relevant tools accompanies this report and was compiled using desk research as well as information provided by interviewees. It lists 73 AI and other advanced technologies with relevance for neurodivergent learners in VET. This list is not exhaustive but it demonstrates the wide range of available tools and their features.

# 2 Potential of AI and other advanced technologies to support neurodivergent VET learners

AI and other advanced technologies (defined in Box 2.1) have the potential to make VET more adaptive, accessible, and inclusive for neurodivergent learners. AI-enabled adaptivity allows instruction and feedback to be tailored to diverse needs, learning styles and abilities, helping bridge gaps in participation and performance. Extended Reality (XR) technologies enable immersive, practice-oriented learning in environments that accommodate individual needs and facilitate repetition and rehearsal. Tools such as text-to-speech, speech-to-text and generative AI can enable learners to engage with materials in their preferred modes, enhancing the accessibility of VET. Other tools seek to directly address difficulties that neurodivergent learners may face, such as with literacy and mathematics, executive function, communication and stress management. Interviewees spoke of how AI and other advanced technologies could help build independence and confidence among neurodivergent learners, while preparing them for a workplace where AI literacy and digital skills are increasingly important. AI and advanced technologies have the potential to make VET delivery more efficient and responsive by automating administrative processes and improving management systems, which may have advantages for neurodivergent learners.

### Box 2.1. What are AI and other advanced technologies?

The study was centred around a simplified definition of AI:[1] *Artificial intelligence – or AI in short – is what enables smart computer programmes and machines to carry out tasks that would typically require human intelligence.* Other advanced technologies refer to technologies with similar features as technologies embedded with AI, as well as technologies that could be easily enhanced with AI's capabilities in the near future.

1. The OECD AI expert group (OECD, 2024[39]) defines an AI system as: A machine-based system that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments. Different AI systems vary in their levels of autonomy and adaptiveness after deployment.

## AI can support adaptivity in VET, allowing diverse needs to be met

AI-enabled adaptivity in VET learning allows for teachers (including trainers) to cater to diverse needs, learning styles and abilities. Part of this stems from AI's ability to quickly generate content, e.g. enabling teachers to generate multiple versions of an exercise sheet. The other part stems from AI's ability to process data, identify patterns and generate recommendations, e.g. enabling learning platforms to tailor instruction according to the individual learner's needs. The main advantage of adaptive learning, highlighted by interviewees as well as in previous OECD work (2023[31]; 2021[40]), is that learners get

instruction and feedback more tailored to their needs across classroom, workshop and workplace environments, bridging the education and training gaps that exist, and creating more inclusive education and training systems that meet needs of learners with and without a specific diagnosis. Interviewees also mentioned time savings for teachers and better learner engagement as other advantages. AI can also be used to adapt and tailor simulations and virtual environments, as discussed in the next section.

Educators shared their own experiences using generative AI to adapt materials for different learner profiles. Veronika Kaska described how teachers in the Astangu Vocational Rehabilitation Centre in Estonia use ChatGPT to tailor exercises according to learners' linguistic and other needs, for a pre-vocational course aimed at non-native Estonian speakers with a disability. She saw the main advantage of this practice as time savings for teachers. Eleni Damianidou described a similar practice in the lower secondary school (general rather than vocational) where she is head teacher. Before this practice started in April 2024, she says that teachers would not have been capable of adapting exercises to this extent, so this represents a substantial advance in terms of the school's capacity to accommodate diverse needs. However, both interviewees stressed the importance for teachers to check the quality of AI outputs, referring to the potential for misinformation discussed in Chapter 4. Eleni Damianidou estimated that AI does 70% of the work, the teacher does 10% and that she (drawing on her PhD in special education) does the final 20%. In another example, Ann Kennedy, a further education tutor, spoke of using generative AI a few weeks into a course to readjust existing course materials according to the pace of the class.

> *"In the case of students with ASD, we try to avoid wording that is generalised or very abstract and give more realistic wording and examples in the questions. Artificial intelligence is good at doing that" Eleni Damianidou, head teacher of a gymnasium, Cyprus*

Thinking about the future, some interviewees shared their vision for how AI could revolutionise VET by providing instruction personalised to each learner. According to the CEO of Ultranauts, an engineering consultancy which provides corporate coaching guided by a *Design for Neurodiversity* approach, learning paths for workplace training need to be modular, flexible, and contextually relevant, tailored to individual processing styles (e.g. tactile, visual, auditory). Although not yet applied in practice, Rajesh Ananda saw clear potential in using generative AI to automatically transform content into various formats that meet individual learner needs. Thomas Köhler, Chair of Educational Technology, at the TU Dresden Institute for Vocational Education and Vocational Didactics, described various innovations that this new data dimension could bring to VET. He gave an example of a project tested five years previously among VET teacher-training students whereby the student could upload an essay and get immediate and detailed feedback from an AI agent trained on course materials, which they could then use to improve the essay. Moving beyond physical environments shared by all learners, the possibility emerges to optimise digital learning and work environments for each learner. Mobile devices in workshops or workplaces open up the possibility for interactions with virtual personas and conversational agents, providing personalised instruction for each learner based on observed behaviours. Similarly, Colm McNamee described how AI could in the future act as a virtual tutor, presenting the curriculum in the modality that best suits each learner's learning style. With AI providing personalised instruction at scale, he imagined that the role of the teacher would transform from traditional pedagogy to facilitating learning.

Developers of existing training and education platforms shared ambitions for AI to deliver personalised instruction at scale, although many acknowledged that the full potential had not yet been realised at the time of interview. An OECD report (2023[31]) on future-ready VET also found that personalised learning with AI was rare in surveyed VET institutions in Estonia, Norway and Scotland. Chief Operating Officer Brad Tombling spoke about how Bud Systems, a training management platform for apprenticeships and skills delivery, is currently building a product that provides AI-generated (and human-verified) qualitative feedback to users' PDF or Word submissions. He identified timely and regular feedback on written exercises as an important factor in keeping VET learners engaged. With both a marketing and a teaching background, the Hoja AI CEO and Co-Founder, Pavan Konanur, is exploring whether the same innovations

that drive hypertargeted marketing can be applied in the education sector. Currently the platform tailors content to learners' interests and goals, learning styles and pace but he saw the potential for "hyperpersonalisation", in which content and communications are updated in real time for each user. For vocational topics such as welding, plumbing and electricity, he imagined that personalised video content could be useful.

While few current examples emerged, interviewees also spoke of the potential to improve existing assistive technologies through adaptive approaches. Janus Asko, Co-Founder of EyeJustRead, described how their reading tool combines eye-tracking and voice data to deliver insights for *reading professionals* (common to Danish schools) on challenges and behaviours, and on which interventions are most beneficial for each individual learner. The company is currently exploring how machine learning can better identify reading patterns and offer more personalised feedback. Nwanneka Udeka, a speech-language pathologist, spoke of AI's potential to enable alternative and augmentative communication (AAC) and cognitive assistance apps to provide real-time feedback to learners, thus empowering them to define and meet their own goals, ultimately enhancing their engagement with learning. Robert McLaren, Director of Policy at Policy Connect, described AI's potential to customise support offered by wearable devices. Currently, smartphone or smartwatch apps can offer task reminders and instructional videos for vocational tasks, but AI integration remains limited. Robert McLaren explained that developers (e.g. of the tool AssistiV) were beginning to explore how AI could customise these supports according to an individual's usual behaviours or provide extra support for situations that the individual finds difficult.

## XR and other advanced technologies can improve VET learning environments

Extended Reality (XR) and other advanced technologies can improve VET learning environments by offering innovative and practice-oriented methods that may be particularly appreciated by learners who have struggled in traditional learning environments. Interviewees highlighted the potential of XR to facilitate immersive and situated learning in VET, creating adaptable environments that accommodate individual needs and allow learners to safely practise complex or hazardous tasks virtually before entering real workplaces.

There are natural synergies between XR and VET, according to Kevin Gonyop Kim, a professor of spatial computing and 3D Technologies whose PhD focussed on applying digital technologies in VET. Straddling digital and physical worlds, XR can provide immersive, context-aware learning environments that are particularly suited to VET (as discussed in Box 2.2), where situated and experience-based learning prepares learners for the workplace. XR is an umbrella term that encompasses technologies blending physical and virtual environments, including Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR). XR can include both non-immersive (where one is aware of their physical surroundings, e.g. watching a display and using a controller) and immersive technologies (e.g. wearing a headset and providing input through gloves or handheld devices).

### Box 2.2. XR can provide immersive, context-aware learning environments that are particularly suited to VET

Kevin Gonyop Kim described how XR works especially well in vocational fields involving physical spaces or objects (e.g. gardening, floristry, fashion design) where digital representations can be easily created and reused as learning materials. He provided the example of apprentice gardeners capturing real gardens through photos or drone imagery, reconstructing them in 3D using machine learning, and using the virtual garden in classroom settings to bridge theoretical and practical learning. With a virtual garden, one can simulate the changing of seasons without having to wait until the next semester. When used in carpentry, XR can help apprentices "visualise the invisible" by overlaying force propagation, explained Pierre Dillenbourg. While some interviewees saw cost of XR as a barrier, there are some situations where it can be cost efficient. Veronika Kaska spoke of one vocational school in Estonia that uses VR to simulate tractor driving and operation because tractor repairs were becoming too expensive. The XR Action Plan, an initiative by the Flemish Department of Education and Training, allowed VET institutions to borrow VR equipment (headsets, iPads, 360° cameras) and software free of charge, according to Kevin Polley of Knowledge Centre Digisprong. Available software covered welding and carpentry, for example, and teacher training was also provided. The XR Action Plan was being evaluated at the time of interview for possible continuation.

Interviewees identified aspects of a virtual environment that would be particularly appreciated by neurodivergent learners, particularly those with ASD and ADHD. The first is that a virtual environment can be adapted to accommodate individual needs in ways that real environments cannot. Kevin Gonyop Kim explained that researchers are currently exploring how they can simplify virtual environments "by blacking out the rest of the world" for learners who have difficulty focussing (e.g. learners with ADHD) and then gradually increase the complexity of the environment as learners progress. The idea of filtering out distracting sounds or unnecessary information by using XR was described by Geena Vabulas (The Oaks Specialist College) as very promising and yet underexplored, with some projects in research phases but not yet in widespread use. Kevin Polley (Knowledge Centre Digisprong) pointed to research (Smet, 2023[41]) showing the possibility of using VR glasses when a learner with ASD is experiencing overstimulation, allowing them to retreat to a virtual space where they can relax without leaving the classroom. Jan Schlueter described how driving simulator SANDI adjusts driving scenarios progressively based on driving performance but also based on eye gaze and physiological data (heart rate and sweat responses) which capture the physical and emotional state of the learner. The driving simulator, often used in vocational rehabilitation, is designed to build confidence and support the path to independence, particularly for those experiencing high anxiety or other cognitive barriers.

> *"It's all about giving the individual who is sitting in that driving chair a pathway to independence, meaning it's all about getting a driver's licence" – Jan Schlueter, CEO of Neurodiverse Technologies, developers of SANDI*

The second advantage is that a virtual environment can allow neurodivergent learners to repeat and rehearse tasks in a controlled space that provides psychological and physical safety. In Finland's largest special-needs VET college, Educational Digital Specialist Piia Jokelainen described how 360° workplace scenes built with Thinglink, AR smart glasses and simulators are used so that learners can pre-visit sites, rehearse task sequences and build a sense of safety before moving to real settings. Access to XR equipment is organised through a central library that teachers can borrow from. For Kevin Polley, the ability to repeat tasks was a strength of the welding and carpentry tools made available through the XR Action Plan (discussed in Box 2.2). Other interviewees highlighted the benefits of repetition and rehearsal for building confidence and managing anxiety and/or overstimulation. This can be useful for developing everyday skills that will help the individual navigate VET and the transition to work. Veronika Kaska was

aware of a hospital using VR to simulate the experience of grocery shopping for patients recovering from a stroke. She and her colleagues thought that similar technology could be extremely useful for building independence among young learners with ASD in their pre-vocational courses, some of whom struggle with anxiety and are socially or verbally restricted. Visiting the store to practise grocery shopping is something that these learners currently do with a teacher. She explained that VR could allow students with very high anxiety to practise this and other everyday skills as many times as needed to desensitise before moving to real-life practice.

Similar tools can be used to practise interview and other workplace interaction skills in a low-pressure environment:

- The VR soft skill training tool, Bodyswaps, was mentioned by two interviewees, Helen Nicholson-Benn (Assistive Technology/AI specialist, Jisc) and Deborah Millar (Executive Director of Digital Transformation, Hull College). Bodyswaps was designed to promote employability skills by simulating workplace interactions such as an interview or interactions with customers. The learner experiences the simulation through a VR headset, playing their assigned role while their body movements and voice are recorded. The learner then swaps roles (e.g. with the interviewer or customer), giving them the opportunity to see their recording along with suggestions for improvement. Helen Nicholson-Benn noted particular interest in the tool among VET institutions while her organisation Jisc evaluated the tool positively in a pilot report (2022[42]). In her college, Deborah Millar said that this tool was mainly used for learners who were non-native English speakers but that she planned to make it available also to learners with special educational needs.
- Auticon (an IT consultancy with a majority-autistic workforce) is developing, with the University of Stuttgart and Fraunhofer Institute, a VR immersive environment tool that will help neurodivergent individuals practise challenging scenarios such as job interviews with real-time emotion feedback. Ursula Schemm, who works in corporate communications at the consultancy, described this area of research as new and growing but said that it was difficult to find market-ready solutions to meet the diverse needs of the Auticon workforce.
- Jan Schlueter mentioned an interview simulation tool currently being developed by Vanderbilt University to help neurodivergent individuals manage anxieties associated with this socially complex event while also training the interviewer to engage successfully with a diverse range of interviewees. The tool will simulate the full interview experience from sitting in the waiting room to being interviewed to dealing with unexpected situations, tracking eye gaze and physiological data.

## AI and other advanced technologies can enhance the accessibility of VET learning materials and instruction

Tools like text-to-speech and speech-to-text enable learners to engage with VET learning materials and instruction in their preferred format, while generative AI allows learners to optimise materials for accessibility. Text-to-speech and speech-to-text tools were seen by many interviewees as foundational for learning as they enable each learner to engage with the curriculum in ways that align with their strengths and sidestep difficulties with, for example, reading, writing or auditory processing. Moreover, by enabling participation on more equal terms and by acknowledging differences in the way that students learn, these tools have the potential to make VET more inclusive. Similarly, an OECD paper on “The Potential Impact Of Artificial Intelligence On Equity And Inclusion In Education (Varsik and Vosberg, 2024[43]) describes the potential for AI to allow students with certain special education needs to participate alongside their peers to a greater extent, contributing to a more diverse and inclusive learning community and enriching the educational experience for all students by fostering an environment of diversity and mutual understanding.

Text-to-speech tools convert written text into spoken words, allowing learners to process information through auditory channels rather than relying solely on reading. This can help learners who struggle with reading fluency, focus or decoding written language. Christopher Patnoe (Head of EMEA Accessibility and Disability Innovation, Google) described these tools as "profoundly impactful" as having text read aloud helps learners with dyslexia to internalise and understand learning materials better than reading could. Clayton Lewis (Professor Emeritus of Computer Science, University of Colorado) spoke of students with dyslexia who had struggled enormously with secondary school because of reading difficulties but later thrived in postsecondary education (and beyond in some cases) after being introduced to text-to-speech tools.

Speech-to-text tools (also known as dictation tools) convert spoken language into written text. In addition to the use of speech-to-text tools for writing (discussed in the next section), interviewees were enthusiastic about their use for live-captioning classes and meetings. Live captioning provides visual reinforcement of spoken information, helping learners who struggle to follow rapid or complex speech. Reading and listening simultaneously can help learners to absorb information, while removing the pressure to take extensive notes and making it easier to look up complex language or terminology in the moment. Note-taking tools such as Plaud, Otter.ai and Limitless combine live captioning with LLM (Large Language Model) features that can summarise notes and generate actions and insights.

Some interviewees remarked that tools that end up being useful for neurodivergent learners are often originally designed to serve other groups. Kellie Mote (Programme Lead (Accessibility) at Jisc) and Ann Kennedy (further education tutor) both noted that live captioning was often introduced to accommodate deaf learners, but there was a growing awareness of the benefits for learners with ADHD, ASD and learning disabilities. As a further education tutor, Ann Kennedy applies live captioning to all class recordings as she has noticed that many learners appreciate this feature. Kellie Mote said that it was often the case that innovative technologies are targeted first at learners with lower-incidence but higher-support needs (e.g. deaf learners, learners with vision impairment or mobility difficulties) and later trickle down to neurodivergent learners. A feature in Google ChromeOS's built-in reading tool, which enables one to highlight a word and have it read aloud, was aimed initially at low-vision users, according to Christopher Patnoe. Later the team realised that the feature was useful for individuals with dyslexia and for individuals learning a second language, and once combined with a distraction-dimming feature, for those with ADHD. Deborah Millar described how many live captioning and text-to-speech features used by neurodivergent learners in Hull College originated as tools to support non-native language speakers. These examples illustrate how thoughtfully designed features can benefit multiple groups as well as learners with co-occurring neurodivergences.

Although text-to-speech and speech-to-text tools are not new, these tools have become more powerful in recent years due to improvements in LLMs and in cloud computing. Marius Frank of Microlink described advances in cloud computing as one of the most profound changes in the past 10 years, since it allows information to be processed at much faster speed than a laptop or mobile device can support. This is what enables tools such as Microsoft Immersive Reader to provide text-to-speech at speed, in different languages and across different Microsoft software. Recent technological advances in LLMs have improved the accuracy, formatting and contextual awareness of speech-to-text tools and the pronunciation, fluidity and intonation of text-to-speech tools, according to interviewees.

> *"If we can start embedding some of these basic universal tools and the use of it to unlock learning for individuals at an early stage, it can be truly transformative for life outcomes" – Marius Frank, Education Director, Microlink PC*

LLMs are also the technology driving generative AI chatbots such as ChatGPT and Copilot, used by some teachers to adapt materials for different learner profiles, as discussed in the previous section. The same tools are used by many neurodivergent VET learners to engage with and to improve the accessibility of learning materials. Interviewees described how these tools could be used to simplify or summarise learning

materials and to assist with interpretation. Christopher Patnoe described how some learners with ASD use generative AI chatbots to, for instance, help explain metaphors, jokes and cultural references. Learners can use the same tools to engage much more closely with the learning materials, according to Lorenzo Desideri (Professor in Psychology and Artificial Intelligence, Sigmund Freud University Milano). He said that many learners with dyslexia are already using ChatGPT to generate custom quiz questions to test comprehension. By framing queries like "Create three multiple-choice questions about this paragraph", students can engage with the material actively, reinforcing their understanding of syntax and content. A number of interviewees mentioned that learners could use Google's Notebook LM to generate podcasts based on inputted materials, providing a new and enjoyable way to learn. David Voss, who works on digital learning in higher education, explained that this tool could be especially powerful for learners with dyslexia who struggle with the speed of reading as it converts materials into a format that is much easier for them to receive. Concerns about the risks associated with generative AI, such as misinformation and overreliance hindering skill development, are discussed in Chapter 4.

## Some tools directly address the difficulties that neurodivergent learners may face in VET

Some tools are designed to directly address the difficulties that learners might experience in VET (and in general education) because of their neurodivergences, such as difficulties with reading, writing and mathematics, executive function, with social interaction and communication and with managing stress. These tools help to develop skills in these areas or provide a work-around, whereas the previous section focussed on tools that enhance the accessibility of learning materials and instruction.[4] This section highlights the tools mentioned by interviewees while the repository published alongside this report provides a longer list of available tools.

### *Tools to assist with reading*

Advances in text-to-speech and in speech recognition (similar to speech-to-text) could also drive enhancements in tools aimed to develop reading skills among learners with reading difficulties. Read&Write is an example of a tool specifically designed for students with literacy challenges, which combines a text-to-speech feature with other features such as screen tinting, which can be helpful for learners with dyslexia. Speech recognition tools can be used to practise reading out loud, delivering instant pronunciation feedback, and reducing reliance on a human tutor. As students improve their ability to pronounce words correctly, they become better at recognising written words when reading. Thus, simple AI-driven speech tools can significantly accelerate reading proficiency and lessen the burden on specialised instructors, according to Lorenzo Desideri. EyeJustRead is a reading tool that combines eye-tracking, speech recognition, and metadata from e-books to provide personalised insights into reading strategies, challenges, and progress, especially for learners with reading difficulties.

### *Tools to assist with writing*

Interviewees mentioned writing assistance tools specially aimed at learners who experience difficulties in this area. By converting spoken language into written text, speech-to-text tools such as Dragon Speech Recognition allow learners to express ideas verbally rather than through typing or handwriting. This can enable neurodivergent learners to express themselves and demonstrate their knowledge more fluidly and to sidestep any issues with spelling. Other tools are specifically designed to address spelling accuracy, grammar and punctuation accuracy, such as Grammarly, which has recently integrated generative AI capabilities (as discussed in Chapter 4).

Many interviewees drew attention to the potential for generative AI chatbots to be used as a tool to assist with writing, given their capacity to refine written text. Learners who struggle with spelling, punctuation or grammar can use the chatbot (where spelling, punctuation or grammar are not the skills being assessed) to detect and correct any errors so that an assignment can be assessed on the basis of content alone. David Voss spoke about the potential to use generative AI chatbots to overcome the "blank page syndrome" which can be an issue for learners with ADHD, by providing a template and some suggested steps to follow. Many interviewees also highlighted the use of generative AI chatbots to improve tone. Deborah Millar described a framework she developed, called PASTA AI, to guide learners with special education needs in Hull College to use generative AI chatbots in a thoughtful way. Learners use the framework to specify the desired Profession, Audience, Style, Tone and Action when writing a prompt. The framework improves the quality of the output and gives learners a different way to engage with the writing process. Deborah Millar felt that, with the right frameworks in place, generative AI chatbots could help empower neurodivergent learners and help them develop literacy skills.

> *"Being able to generate ideas with something to start, say, an essay assignment or written assignment is something that will be helpful, I think, particularly with conditions like ADHD. It's "where do I start?", "how do I get started?" and then once you do get started, you can fly" – David Voss, who works on digital learning in higher education*

### *Tools to assist with mathematics*

Interviewees highlighted a small number of tools aimed to address difficulties with mathematics or in writing mathematic notation. The Luovi Vocational College features drawing screens that can make mathematics learning more visual and active floors that can make it more tactile and engaging, according to Piia Jokelainen. Clayton Lewis spoke of his experience developing software to help with algebraic notation by taking pen-and-tablet handwritten input, fixing errors and producing output that could be assessed by teachers. Not only did the software help teachers assess learners' work, but it also helped learners reflect on their own learning processes and identify strategies that would be useful for them. While the software never developed beyond the testing phase, he saw this as an idea that could be revisited given recent advances in AI. In his view, decoding partial information is a particular strength of AI. This is what enables text-to-speech tools to operate smoothly without stopping to correct spelling mistakes, for example. In a similar way, AI-enabled software could make algebraic notation far more natural.

### *Tools to assist with executive function*

Planning, time management, working memory and attention (all elements of executive function) can be challenges for some neurodivergent learners in VET, which make it harder to organise, prioritise, and complete tasks in learning and workplace settings. Interviewees spoke of the potential for AI and other advanced technologies to help learners address these challenges, which can particularly affect learners with ADHD and ASD.

Tools such as Goblin Tools and Tiimo can help support planning and time management. Goblin Tools enables users to create to-do lists and to estimate how much time each task will take. VET learners can use these tools to break down assignments into manageable chunks and to signal "what's coming next", according to Nwanneka Udeka. Tools such as this can enable learners to complete tasks more independently and avoid frustration stemming from missed deadlines or unclear expectations. Geena Vabulas identified accessibility as one of the key strengths of Goblin Tools; it requires no login, is free, has a simple interface and accepts speech-to-text input. She noted that some upper secondary schools were already using Goblin tools, helping to prepare learners for the transition to work and introducing them to a tool that can continue to support them once they are in work.

Many learners who experience difficulties with working memory use alerts and notifications in their daily life. Francesc Sistach made the point that even very simple technologies – like alarms on a smartwatch or calendar apps – can dramatically help neurodivergent learners organise their time. In his view, small, readily available technological aids often yield outsized benefits compared to more complex systems. Other interviewees highlighted ways that AI could enhance the same tools. For example, David Banes (David Banes Access and Inclusion Services) spoke about how the same systems could use AI adapt notifications and alerts by recognising patterns in the users' behaviours or regular schedule and by voice assistants (e.g. Amazon Alexa, Siri) that can report back verbally. Alisdair Gurling suggested that wearables such as the Ray-Ban Meta glasses, used by blind and low-vision users, could be useful for neurodivergent learners, providing embedded reminders and an ongoing connection between digital and physical life.

Some tools provide video and written reminders, which learners can access via QR codes or NFC tags placed in strategic locations, removing the need to rely on memory alone. Step-by-step instructions enable learners with memory difficulties to carry out sequential tasks, which is often required in vocational and protected work settings, according to Lorenzo Desideri. By following the instructions, learners can operate with greater autonomy and lower cognitive load. He described strategies such as this as particularly useful for learners with ASD and with learning disabilities. One example of such a tool is AssistiV, which Geena Vabulas described as highly supportive, although she noted that it was best suited for users receiving government grants since it requires significant initial setup. Robert McLaren saw the potential to enhance these tools further by embedding the latest advances in AI and augmented reality so that support could be personalised to the user and to the environment (addressing a barrier discussed further in Chapter 3).

Mind-mapping software can help learners to transform existing learning content into a visual graphic, helping them to engage with the content and to organise their thoughts. David Banes described these tools as particularly useful for learners with dyslexia. While these tools are not new, some mind-mapping tools have recently integrated generative AI features. Helen Nicholson-Benn gave two such examples: Ayoa allows the user to generate images and mind maps based on a free text prompt, while MindView uses generative AI to simplify and transform inputs. Marius Frank saw mind-mapping software as useful for all learners regardless of neurotype. He made the point that making tools such as this available to all learners improves the inclusiveness of the educational environment overall, as all learners benefit while those with neurodivergences can get the support that they need.

> *"If we open up minds to the possibility of using mind mapping tools and organisational tools to every child, then what we are doing is equipping young people to reach for the tools that they need at the time that they need it most" – Marius Frank, Education Director, Microlink PC*

Alisdair Gurling suggested that learners who struggle with focus could benefit from apps that generate soundscape background music. One example is the Endel app, which uses AI to generate music taking into account the weather, the time of day and the heartrate of the user (using a smartwatch). The music adjusts to the heartrate and then reduces the beats per minutes in an effort to promote calm and focus.

### *Tools to assist with communication and social interaction*

Interviewees identified some tools aimed at addressing difficulties with social interaction and communication, ranging from alternative and augmentative communication (AAC) apps to social robots.

Nwanneka Udeka highlighted the important role of AAC apps, such as Proloquo2Go and TouchChat, in giving learners who struggle with verbal communication a way to express themselves. Users preload relevant vocabulary onto the app on their phone or tablet, such as words for requesting a break, answering a question about a lesson topic, or greeting peers. These apps thus enable learners to participate alongside neurotypical classmates, despite verbal limitations, ensuring they do not miss critical instruction.

Interviewees described the potential for social robots to support the development of social, emotional and language skills, particularly for learners with ASD. While social robots have been traditionally aimed at children, interviewees highlighted their potential to be used in VET and among users of all ages. These robots interact with learners through speech, facial expressions and gestures, which many learners find engaging and comfortable. Another advantage is that they allow the user to practise interactions repeatedly, an advantage also associated with the XR tools described in the previous section, designed to simulate interview and other stressful scenarios. By encouraging learners with ASD to engage within the educational setting, social robots can also facilitate inclusion and encourage interaction with peers, according to Lorenzo Desideri. As a side effect, he noted also that social robots often motivate teachers to innovate and to promote more inclusive learning.

- LuxAI produces social robots, such as their QTrobot, to help individuals with ASD, among others, develop social, emotional and language skills in schools, therapy centres and homes. Chief Operating Officer Aida Nazari described how the robot uses a camera to monitor gestures, facial expressions and behaviour and uses AI to personalise interactions. The degree of freedom of the AI can vary by use case, from facilitating open-ended conversations where appropriate, to delivering pre-programmed activities where a specific evidence-based approach is required. In vocational education, she described how QTrobot could be used to practise an interaction with a receptionist, a doctor or a call centre worker, for example.
- Another example is Felix, a social robot designed to support people, especially those with psychosocial or communication difficulties, in expressing and tracking their emotions. Felix is connected to an online platform that logs emotional input and helps identify emotional patterns over time, facilitating discussions with coaches or teachers. Rob van de Ven, whose company Happybots produces Felix, mentioned that they were exploring using AI to enhance the analysis of emotional data. For example, AI could help detect trends such as a 10% decrease in emotional outbursts over the past year, patterns that might otherwise go unnoticed. In educational contexts, Rob van de Ven described how Felix could be used to help learners to express how they feel in a simple, non-verbal way, which helps prevent emotional build-up and behavioural incidents. Rob van de Ven also saw potential to use Felix in internships or work-based learning settings.

### *Tools to assist with managing stress*

Stress can be a response to having to navigate education systems and workplaces that are not designed for neurodivergence. Interviewees described how digital support systems could help neurodivergent learners in VET to navigate potentially stressful situations that can arise in VET and in the transition to work, and the potential to develop these tools further. Geena Vabulas described a situation that could be overwhelming for a neurodivergent learner: the bus they usually take to go to a work placement does not arrive. Stress and overwhelm could prevent the individual from finding a solution in that moment. Digital support systems such as Brain In Hand are designed to help the individual access pre-defined strategies (e.g. text work, call home, wait for the next bus) in such moments. Geena Vabulas spoke of differing perspectives she had encountered in her research: some neurodivergent learners wanted digital support systems to be developed further so that they could operate much more autonomously (e.g. calling a taxi on your behalf) whereas others preferred to retain control. David Banes suggested that in future, digital support systems could be linked to wearables that detect behavioural or physiological indicators of stress, to enable earlier intervention.

## AI and advanced technologies can improve VET systems so that they can better accommodate diverse needs

An OECD report (2023[31]) on future-ready VET describes the potential for digital technologies to better manage and communicate in VET by automating administrative tasks, improving the exchange of information, and by tracking learning activities and progress across different learning environments. Some interviewees made the point that these efficiencies and improvements to VET systems could also benefit neurodivergent learners. They gave examples whereby AI and advanced technologies could: alleviate time and staffing pressures and thereby enable teachers to spend more time with learners who need more support; improve training providers' management systems so that additional learning needs are documented and accommodated; help neurodivergent learners to navigate the VET system; and mitigate early school-leaving.

If AI and advanced technologies can remove time and staffing pressures in VET, teachers may be able to spend more time with learners who need more support and explore technologies that could make the learning environment more inclusive. A handful of interviewees spoke of the time savings for teachers using AI for lesson planning, creating lesson resources and for administrative tasks. Kellie Mote described how many teachers in higher and further education are currently using TeacherMatic, an interface that helps them build prompts for generative AI. A Jisc pilot (2024[44]) estimated time savings of two hours ten minutes per week for the average teacher. In the context of staff shortages in rural German schools, which are so severe that some education authorities have already reduced the school week to four days a week, Thomas Köhler said that some had suggested that AI assistants could fill critical gaps. He was careful to specify that this was proposed only as an emergency measure, rather than as the future of teaching.

AI and advanced technologies could improve training providers' management systems so that additional learning needs are documented and accommodated. Bud Systems is a training management platform built originally for apprenticeships but now serving broader vocational education and skills delivery. The platform is sold to training providers as an integrated solution for programme design, enrolment, back-office administration as well as training delivery. While the system works well without AI, according to Chief Operating Officer Brad Tombling, in recent months, they have found a few use cases where AI can offer improvements: a chatbot work assistant for training providers (which they will soon extend to learners) and AI-generated qualitative feedback to learners' written submissions (discussed earlier in this chapter). A partnership with Cognassist (a neurodiversity assessment tool) enables training providers to document learners' additional support requirements and needs and to adapt training delivery accordingly. This means that when a teacher sets an exercise for a learner through the platform, they will see that the learner should be given additional time to complete the exercise, for example, or that the learner requires the exercise to be sent in a particular format.

> *"We're not looking to leverage AI and then find something that it solves. We're trying to identify a specific problem and then evaluate whether AI plays a role in the solution to it" – Brad Tombling, Chief Operating Officer, Bud Systems*

Two interviewees gave examples of AI that could help retain neurodivergent VET learners, one by helping them navigate VET environments and the other to address an important risk factor for early school-leaving. One project explored by Thomas Köhler (TU Dresden Institute for Vocational Education and Vocational Didactics) together with Austrian and Norwegian colleagues, was to develop an organisational assistant for VET learners, i.e. a chatbot that they ask questions such as "where I can find my learning resources?", "do we have an exam next Monday?", and "who can help me with this subject?". He described the project as working well in virtual learning environments but needing more work to adapt it for physical learning environments. Motti Sigel (Managing Director, MassChallenge Israel) spoke of the existence of AI-enabled anti-bullying tools. One startup supported by MassChallenge aimed to identify isolated students in schools

in order to target interventions to prevent bullying. Such tools could help educational institutions, including VET institutions, safeguard and retain neurodivergent learners.

## AI and other advanced technologies can support the transition from VET to employment

The use of AI and other advanced technologies can help neurodivergent learners build employability skills within VET and can also directly support the transition to work by supporting them in the job application process and in the job itself. Interviewees highlighted two important features of generative AI: that its widespread use helps remove some of the stigma associated with use of assistive technologies and that individuals may appreciate being able to continue using the same tools as they transition from VET to employment.

A few interviewees made the point that because neurodivergent learners can be very talented at using new technologies, greater use of technology in VET would enable them to play to their strengths and to build independence, confidence and other employability skills that would help in the transition to employment. Ann Kennedy, a tutor, hoped her further education students would ask generative AI chatbots questions they would not feel comfortable asking in class, enabling more independent learning. In the (general rather than vocational) lower secondary school where Eleni Damianidou is head teacher, teachers set aside time during special classes (with learners with ASD) for learners to investigate the topic they are being taught using a generative AI chatbot. Classes are small, allowing teachers to supervise the process. In Eleni Damianidou's view, this exercise helps to build the self-confidence necessary to later seek good job opportunities where their talents will be valued, something that could also be beneficial for VET learners. David Banes suggested that learners who struggle with social interactions could use generative AI chatbots to script small talk to help them navigate professional environment. Thomas Köhler spoke of a woman he had interviewed years before who was too shy to communicate with colleagues in person. She started to communicate with people over the early internet and, with time, used this practice to adapt her behaviour in face-to-face interactions. He saw the potential of AI to be used in similar ways.

> *"If I could reassure the students that 'this is your safe space, this is where you can just relax and you get to learn stuff – you don't have to learn stuff, but you get to learn it if you want it', that's really the core" – Ann Kennedy, further education tutor*

Thorkil Sonne, Founder of the Square Foundation spoke of a programme using Lego Mindstorm robot kits to bridge the transition to work by creating an environment where people with ASD can show their strengths. Participants in the programme are brought to a physical office of a company that might later offer them placements. Participants start building a programmable robot individually (first week), then as a group (second week), learning how to use the Scrum project management framework to organise resources, brainstorm and choose which ideas to pursue. Participants are comfortable in the office environment by the time they meet and present their project to prospective managers and coworkers (third week) and before they are invited into a real work setting where they can understand the tasks they would carry out if offered a job (fourth week).

AI and other advanced technologies could help neurodivergent learners in the process of applying to jobs, interviewing and onboarding, according to interviewees. The potential to use XR-enabled tools for interview practice is discussed earlier in this chapter. Interviewees also highlighted the potential to use generative AI chatbots and writing tools such as Goblin Tools to refine CVs and cover letters. Freya Bevan (Digital Learning Coach, Gloucestershire College) explained that Goblin Tools has a feature called Formalizer, which changes the tone of language, e.g. enabling an apprentice to make a cover letter formal, friendly or sophisticated. Although previous OECD research speaks of the potential for AI to improve labour market matching, including increasing the diversity of applicants (Broecke, 2023[45]) – and to improve matching

between learners, institutions and employers in VET itself (2023[31]) – interviewees for this project were more concerned about AI leading to bias and discrimination when used in recruitment tools (as discussed in Chapter 4). Only one interviewee gave an example of the potential of AI to match individuals to opportunities: Auticon, an IT consultancy with a majority-autistic workforce, is currently developing an AI-enabled solution to help match their consultants to prospective projects based on skills and experience, according to Ursula Schemm. They also use AI to improve employee onboarding.

Once in the workplace, widespread use of AI at work could not only help neurodivergent employees but could also remove some of the stigma associated with use of assistive technologies. Interviewees spoke of the wide variety of generative AI tools available to edit emails and other documents, to transcribe and summarise meetings, and to perform many other daily tasks in a desk-based job. Nathaniel Cook (Chief of Information and Technology, Special Olympics) described how these tools level the playing field, effectively "democratising ability" by removing some of the structural barriers to participation and self-expression. When his organisation, the Special Olympics, rolled out Copilot, they found that employees with disability gained twice as much in productivity (12 hours per week saved) compared to their colleagues without disability. Many interviewees highlighted that generative AI tools are accessible to all employees, whereas previously available writing aids and dictation tools might have been limited to those who could prove their need and/or disability status. Not only does this remove a practical barrier for neurodivergent employees, but it removes some of the stigma that surrounded assistive technologies. With the recent enthusiasm around generative AI, people are even excited to share how they use these tools in innovative and playful ways, according to Alisdair Gurling.

> *"They've reframed it from being something that helps them mitigate a deficit to some strength-based thing that's really exciting" – Alisdair Gurling, researcher at Wonderlab, Monash University*

Key to ensuring that the potential of these tools is met, is ensuring that learners can continue using the same tools as they transition from VET to employment (which involves overcoming the barrier of insufficient interoperability, described in Chapter 3). In an ideal scenario, according to Thomas Köhler, AI could assist neurodivergent VET learners in the form of an individualised companion integrated on a mobile device suitable for classroom, workshop and workplace settings, thus providing continuous support as the individual transitions from learning to employment and even across their entire life. Many interviewees saw continuity of use as a particular strength of generative AI chatbots, as well as other tools that support the accessibility of materials, such as Goblin Tools, text-to-speech, speech-to-text and Microsoft Immersive Reader.

> *"It may accompany the learners to their workshop or even future workplaces. [...] Learning would not need to stop at the end of the school" – Thomas Köhler, Chair of Educational Technology, TU Dresden Institute for Vocational Education and Vocational Didactics; Director, TU Dresden for Open Digital Innovation and Participation (CODIP)*

# 3 Barriers to effective use of AI and other advanced technologies to support neurodivergent VET learners

AI and other advanced technologies hold promise for supporting neurodivergent learners in VET, however a range of barriers prevent the full potential from being realised. Learners, teachers and employers can be overwhelmed by the growing number of available tools, while VET teachers often lack the necessary skills, resources and encouragement to fully engage with new technologies. While desk- and computer-based work can easily accommodate new tools, the diversity of work and learning environments within VET presents practical and technical challenges. Affordability remains a significant barrier, limiting access and driving inequalities. At the same time, many promising technologies fail to reach the market, and those that do often do not align with the real needs of VET institutions, teachers and learners, and do not integrate well with existing systems. Furthermore, deployment of promising tools within VET will be uneven as long as gaps in infrastructure and connectivity persist, and as long as AI tools serve certain languages and cultural environments better than others.

## Learners, teachers and employers are overwhelmed by the number of available tools

An overload of choice can make it difficult for learners, teachers and employers involved in VET to choose the right tools for their needs and environments. While interviewees generally welcomed recent advances in AI and other advanced technologies, including free and easily accessible generative AI chatbots, some mentioned the challenge for learners and teachers to keep pace with the emergence of new tools and new versions of existing tools. Christopher Patnoe (Google) explained that learners and teachers have a limited capacity to take in a vast amount of information, with the consequence that they are often unaware of useful accessibility features and that existing tools are not used to their full potential. Discoverability is a challenge that prevents new companies in the accessibility space from breaking through, as highlighted in previous OECD research (Touzet, 2023[46]) on the use of AI to support people with disability in the labour market.

It requires an enormous effort for a learner to keep up to date with all the assistive tools available. As an undergraduate student, Alisdair Gurling started researching tools to support people with ADHD, building complex systems to map and categorise them. What started as a hobby ended up being the starting point of his PhD, which focusses on mindset shifts around neurodivergent adoption of assistive technologies and led to his current work as a researcher at Wonderlab, Monash University. He described how learners with ADHD could be discouraged by having to navigate new websites and processes, set up multiple

accounts and manage passwords, and keep track of syncing of various systems. His research has identified negative mindset as a further "hidden hurdle" that can lead to indifference and inertia around potentially useful tools.

> *"If you're telling yourself that you are broken and that you can't be fixed, then it produces a sense of indifference and inertia around adopting new tools. Why fix something? Why spend any time attempting to fix something that's irrevocably and permanently broken?" – Alisdair Gurling, researcher at Wonderlab, Monash University*

Misinformation can thrive where new tools and features outpace robust and independent evaluation. Rajesh Ananda (Ultranauts) and Cristina AnaMaria Costescu (Associate Professor, Special Education Department, Babes-Bolyai University) expressed concern about companies making claims about their tools that are not backed by evidence, while Neil Milliken described how peer groups and social media can diffuse and amplify misinformation. The consequence is that learners and teachers are steered to tools that are not right for them.

Choosing the right tools is particularly important when resources are limited. Given the time required for users to adapt to a new tool in VET or in the workplace, it is not as simple as choosing the latest available tool, according to Hélène Chinal, Capgemini's Southern and Central Europe Head of Transformation. The selection process itself can be resource intensive and inefficient. Piia Jokelainen, Educational Digital Specialist at Luovi Vocational College, explained that in many European countries, each institution is responsible for managing its own selection process, with the result that hundreds of institutions might each have to spend a couple of days checking whether a given tool is safe.

> *"Things move at such speed that the tools of one year ago are no longer the tools of today, so one needs to be constantly vigilant" – Hélène Chinal, Capgemini's Southern and Central Europe Head of Transformation*

## VET teachers often lack the capacity and support to use AI and other advanced technologies to support neurodivergent learners

VET teachers need adequate preparation and institutional support to identify and respond to diverse learner needs, including through the use of AI and other advanced technologies. However, these elements are often lacking, according to interviewees. As a result, many VET teachers (including trainers) lack the skills and confidence to use AI and assistive technologies pedagogically for neurodivergent learners. Additionally, rigid curricula, risk-averse cultures and unclear guidelines limit experimentation, so even when devices are procured, they remain underused.

The VET teachers interviewed as part of this study generally used AI and other advanced technologies in their teaching and/or administrative tasks to support neurodivergent learners. Their interest in and knowledge of this topic is why they were invited to participate in the interviews for this project. In many cases, these teachers experimented with and developed skills in AI and other advanced technologies on their own personal initiative. However, this group is not representative of the full VET teacher population.

In reality, the level of skill in AI and other advanced technologies and the attitudes towards them among VET teachers varies greatly. In the most recent OECD Teaching and Learning International Survey (TALIS) of (non-VET and VET) teachers, three in four say that they lack the knowledge or skills to teach using AI while approximately half say that they do not believe AI should be used in teaching (OECD, 2025[47]). Additionally, a quarter of teachers reported a need for training on SEN.

VET teacher training can leave teachers without adequate preparation to use new technologies to address diverse needs, according to interviewees. Pierre Dillenbourg explained that in Switzerland, teacher training for VET teachers was unlikely to include much training on learners with neurodivergences or disability and on the tools available to support them. He gave an example of a typical profile of a VET educator, a 45-year-old carpenter who transitions to teaching carpentry due to a back injury, and the training they might

receive. He imagined such a person receiving at most two hours of training on learning disabilities. He described VET teacher training as always 10 years behind the current technology. Speaking about the United Kingdom, Rohan Slaughter described a lack of training on assistive technologies even among specialist teachers, occupational therapists, speech and language therapists, and professionals who might support a student's transition into the labour market. For example, the national professional qualification for SENCOs (Special Educational Needs Co-ordinators or teachers in mainstream schools who oversee the strategic development of SEN policy and provision) was only changed in September 2024 to include intended learning outcomes on assistive technology. In the same vein, Susan Scott-Parker (Founder of Business Disability International) pointed out that initial teacher education and certification often do not require skills in inclusive, assistive and AI tools. She urged education authorities to build these requirements into pre-service training so trainee teachers know which tools are likely to be used, how to use them, and how to keep up as technologies change. Otherwise, devices bought later go unused. She also noted examples in the United Kingdom where specialist providers such as Microlink train teachers, but said this depends on local initiative, stressing the need for earlier, system-level approach.

Once in the job, VET teachers have reason to engage cautiously with AI and advanced technologies. According to interviewees, they are often aware of the risks discussed in more detail in Chapter 4: that AI could undermine privacy; increase misinformation; encourage cheating; and hinder learning. Ann Kennedy, a tutor working in further education, explained that teachers generally want to ensure that the core principles and values around teaching are respected before introducing new technologies and methods. Freya Bevan, Digital Learning Coach at Gloucestershire College, estimates that 25% of teachers in an institution such as hers might have used AI out of their own initiative, with a further 25% using it once encouraged to do so, while 50% would oppose AI. In her view, opposition to AI is more likely among: more experienced teachers than less experienced ones; among teachers in higher education than in (vocation-oriented) further education; among teachers without industry experience; and among teachers of certain subjects (e.g. mathematics, English) than of others (e.g. computing, game design, forensics). With opinions varying significantly between VET teachers, institutions can play an important role in setting the culture, rules and guidelines for engaging with AI and other advanced technologies.

In some countries and contexts however, institutional culture and rigidities can discourage VET teachers from innovating and experimenting. Many interviewees mentioned that institutional change takes time. Thomas Köhler described an institutional culture in some central European countries which limits teachers' freedom and mindset to explore. He said that he had seen some non-European institutions (for instance, in Africa) with much fewer resources that were more open in this regard. According to Lorenzo Desideri, some national education authorities dictate rigid curricula – often valorising traditional, pre-digital methods – which inadvertently stifle teachers' ability to innovate. In Italy, he explained, official guidance sometimes implies that "classic" approaches are superior, which discourages teachers from integrating AI solutions in creative, context-specific ways. Additionally, bureaucratic hurdles, such as the need for special authorisations to use nonstandard platforms, discourage experimentation.[5]

One consequence is that teachers often lack a clear policy or guidelines around the use of technology, which could provide practical implementation tips and encouragement, while alleviating concerns about accidentally breaching internal rules or regulations. In Estonia, national teacher guidelines for supporting special education needs learners currently do not include references to AI, reflecting the early stage of AI integration in practice, according to Sandra Fomotškin, an Advisor on Inclusive Education at the Ministry of Education and Research. A lack of ongoing support and unclear guidelines are reasons why instructors often revert to surface-level use of technologies instead of exploring the full functionality according to Lorenzo Desideri. In his view, schools invest heavily in purchasing devices but underinvest in fostering the skills and institutional flexibility required to leverage these tools optimally. Nwanneka Udeka, a speech-language pathologist highlighted the importance of clear implementation guidelines that show instructors exactly how to incorporate the technology into lesson plans. A lack of guidelines – combined with insufficient continuing professional learning and competing classroom demands – is why she estimates

that only about 30% of AAC devices provided to students by speech-language therapists are later used in the classroom by the teacher. Piia Jokelainen reported that only about 10% of teachers in Finland are active users of AI tools, while more than half express interest but find the tools too complex or lack of guidance to explore them. This indicates a latent readiness that could be unlocked through targeted support and simplified implementation models.

Teachers often have few opportunities to observe how inclusive digital tools are being used in workplaces – such as AI-assisted communication, adaptive task management systems, or sensory-friendly technologies – resulting in a disconnect between the classroom experience and the evolving demands of inclusive labour markets. Rohan Slaughter and Pierre Dillenbourg noted that while companies increasingly deploy AI to enhance accessibility and personalise tasks, VET teachers rarely have structured exposure to these developments. Hiren Shukla (EY) and Francesc Sistach (Specialisterne) further highlighted that neuroinclusive employers already leverage AI to tailor onboarding, communication, and productivity tools for neurodivergent staff, yet these approaches seldom inform VET pedagogy or teacher training. Brad Tombling (Bud Systems) added that rigid training plans and slow curriculum adaptation make it difficult for providers to align learning with such innovations.

Both Lorenzo Desideri and Nwanneka Udeka highlighted the importance of ongoing collaboration among all stakeholders around the student, including teachers, parents, peers and support professionals. Without this, AI and other advanced technologies will not be used to their full potential to support neurodivergent learners in VET, because tools will not be deployed in the first place or because useful features of deployed tools will remain dormant or inconsistently applied.

## Attitudes and lack of awareness among employers can be a barrier

Attitudes among employers can also be a barrier to deploying AI and advanced technologies to support neurodivergent workers and/or learners making the transition to work. According to Hiren Shukla and Heather Tartaglia, both of EY, many organisations underestimate the productivity gains and innovation potential associated with inclusive AI use, and a lack of concrete examples and negative first experiences further dampen adoption. Nicole Lonican, of the Cuimsiú Inclusive Pathways to Employment Programme, noted that despite generous resources provided by the Irish Government (reimbursement of 100% of the cost of assistive technology and 90% of accessibility awareness training), Irish employers were sometimes unaware of the supports available. In France, as noted by Redwane Bennani, CEO of Talents Handicap, employers often lack knowledge of the regulatory framework, of working with people with disabilities, and of the supports available.

## Challenges remain in applying AI to the diversity of work and learning environments in VET

Applying AI and advanced technologies in VET to support neurodivergent learners and workers remains difficult, as many of the roles that VET prepares learners for rooted in manual or practical activities, where one works on their feet, and often in noisy, shared and unpredictable settings (like kitchens, workshops or hospitals). The application of AI to these work environments and to VET has been much slower than in office environments and academic learning due to the diversity of work environments and associated technical challenges, such as portability and edge limits and the lack of rich, industry- and region-specific contextual data to train AI models.

Portable solutions are useful where VET prepares learners for roles where they will work on their feet. Yet there seems to be a knowledge gap on how AI and advanced technologies can be leveraged in these roles and tasks. Assistive technologies have traditionally been oriented around desk-based work and learning

and the process of integrating AI and augmented reality into cognitive assistance tools hosted on portable devices (e.g. phones, tablets, glasses or watches) has been slow. Robert McLaren gave an imaginary example of a hospital porter loading an industrial washing machine and receiving customised task reminders and tips on their smart glasses prompted by the porter's location or their usual behaviours. He explained that many cognitive assistance and coaching tools are in development for deployment in situations such as this, but that they tend to be based on QR codes and NFC (Near Field Communication) rather than leveraging the latest advances in AI or augmented reality to personalise support to the user and environment.

> *"There's a bit of a bias whereby the industry and government programmes skew towards desk-based roles so people with learning disabilities/neurodiversity in those roles are more likely to get access to assistive technology than people whose roles or their vocational training doesn't involve sitting at a computer very much […] People haven't really thought enough about how technology can work within those roles" – Robert McLaren, Director of Policy, Policy Connect*

Part of the challenge is technical. Yonah Welker (Public Technologist and Visiting Lecturer) described how recent advances in visual and 3D foundation models could have significant potential to support a VET learner or worker with disability and/or neurodivergences, but technical challenges (e.g. energy and autonomy requirements) can prevent models from being hosted on portable devices. He suggested that advances in adaptive scaling (to adjust computing resources in real time according to demand), offline inference (to run models in low-connectivity environments) and edge optimisation (to adapt models to device constraints) could allow AI to be deployed more reliably and efficiently in resource-constrained, real-time environments.

Another technical challenge is a lack of appropriate training environments for AI. Before the latest advances in computer vision, speech recognition and robotics can be usefully deployed in complex work environments (e.g. a hospital) the models must be trained on large amounts of contextual data. While useful datasets already exist showing people navigating everyday activities in real-world settings,[6] Yonah Welker described the current suite of video datasets as good enough for use in the Metaverse or for entertainment purposes, but lacking the richness needed for AI to be successfully applied in contexts such as vocational education, where tools will need to be tailored to very specific skills and to the terminology of a particular industry, country and/or region. Clayton Lewis noted that advances in machine learning had reduced the need for contextual training data. In the past, he explored the idea of developing a "job coach" virtual assistant that could, for instance, help a trainee gardener navigate a physical space and handle any safety risks. He concluded that the project was not feasible when the experts asked for 10 000 labelled examples of potential situations that could arise. Today, tools such as ChatGPT can identify, without any specific contextual training, that a picture of a lit match held up to a wasps' nest depicts a risky situation. While Clayton Lewis acknowledged that rich contextual data would still be needed to support complex applications such as a "job coach" virtual assistant, this suggests a multifaceted solution to this challenge.

> *"In school, an AI tutor can help you understand history. In VET, AI has to help you safely wire a circuit, measure medication or navigate a shop floor, often with one hand or through a haptic interface" – Yonah Welker, Public Technologist and Visiting Lecturer*

## Affordability is a barrier to access and a driver of inequality

Affordability of AI and advanced technologies can mean that useful tools remain inaccessible to public institutions and to VET learners with low and limited resources, or remain undeveloped beyond the pilot stage. Veronika Kaska, Deputy Director of the Astangu Vocational Rehabilitation Centre, described how financial limitations had prevented her centre from implementing a VR tool that she thought had the potential to help learners with a wide range of disabilities in pre-vocational courses to practise and strengthen everyday skills. Francesc Sistach saw limited budgets as the reason why there is not yet any

comprehensive, off-the-shelf workplace coach for neurodivergent users, despite some university labs and startups developing promising pilot projects and prototypes. Although many generative AI tools currently have a free version, paid models could become more common in the future, limiting access for schools, employers and individuals that cannot afford to pay. Nathaniel Cook pointed out that access to technology is already a challenge for many people with disability.

Access to AI and advanced technologies for institutions, employers and individuals is often funded by government. Yet, a number of interviewees observed that neurodivergent learners in VET were not priorities for public funding. For instance, Carlos Pereira, CEO of Livox, described how his assistive technology devices are often bought by cities, but only if there is money left in the budget, since people with disability are often not considered a priority. While funding for all education is limited, Veronika Kaska remarked that governments often prioritise scientific research and higher education over VET. Robert McLaren pointed out that, in the United Kingdom, the Disabled Students Allowance, which can cover the costs of assistive technology, is only available to higher education students, meaning that most VET students cannot access it. They will instead need to rely on Education, Health and Care plans (which in many cases do not cover assistive technology) or on college resources (which would be higher in SEN institutions targeted towards learners with learning disabilities).

> *"People with disabilities, they are not a priority. Although they are the biggest minority on Earth – there are 1 billion people with disabilities on the planet – they are always left behind" – Carlos Pereira, CEO, Livox*

Many interviewees described current funding levels as insufficient. Elisabetta Bertola (Irisbond) described the situation as high-cost devices meeting limited public subsidies. She remarked that public funding varied significantly across EU Member States, with higher funding available in Germany and France than in Spain, Italy and Portugal. In Chile, public funding has been provided, but at an insufficient level to scale or sustain broader impact, according to Ricardo Rosas, Professor at the School of Psychology at the Catholic University of Chile. Many assistive technologies are costly due to high development costs combined with a lack of competition, according to Yonah Welker. Hardware for many simulation tools is expensive, requiring a substantial upfront investment, according to Jan Schlueter, whose company has created SANDI (Simulator for Advanced Neurodiverse Driving Instruction).

Part of the challenge is convincing decision makers of the long-term return on investment. Current evidence on assistive technology's impact tends to be fragmented, small-scale and qualitative in nature, according to Robert McLaren. Without more robust impact evaluation, he says that it is difficult to justify government funding and large-scale integration of AI tools in VET. Susan Scott-Parker explained that the long-term benefits of early intervention could be difficult to measure and evaluate in financial terms. However, even where substantial financial returns are established,[7] it can be difficult to translate this into action when key officials responsible for education and training do not articulate the rationale for investing in assistive technology and in related teacher training (according to Susan Scott-Parker), and when there are competing priorities and a lack of political will (according to Francesc Sistach).

In some regions and systems, the process for individuals and employers to apply for access to assistive technologies is a further barrier. Elisabetta Bertola (Irisbond) explained that application processes in Spain and in other EU member countries were complex and lengthy, with the result that only 10 to 20% of those in need get the necessary support. In the United Kingdom, delays accessing the Access to Work grant (which can cover the cost of assistive software) reduce its effectiveness, according to Geena Vabulas. Delays mean that an individual might not be able to access the funds until six months after a job offer, which might be too late for the individual to demonstrate their performance and suitability to the work and might be entirely incompatible with short-term work experience. Where access to supports depends on disclosing a condition or providing a formal diagnosis, this represents a further barrier to assistive technologies, as discussed in Chapter 1.

Funding challenges naturally create inequalities in access. Yonah Welker cited a WHO study showing that in low- and middle-income countries only 10% of those in need can obtain assistive technologies in contrast to 90% in high-income countries (Stawiska, 2024[48]). Nwanneka Udeka described how the availability of AAC and executive-functioning devices varies greatly by region, school funding and insurance coverage.

Infrastructure and connectivity still constrain use of AI and advanced technologies in VET, particularly in training centres and workplaces in rural or under-resourced regions. Marius Frank explained that even in developed countries, such as England, some students and some schools do not have good broadband connectivity, meaning that the potential of AI cannot be realised.

> *"A critical consideration across every country is connectivity and infrastructure, because otherwise everything we're talking about becomes impossible" – Marius Frank, Education Director, Microlink PC*

## Many promising assistive technologies fail to make it to market

The process of bringing an assistive technology from lab to market is lengthy and filled with obstacles. Many technologies that show promise in initial research stages will never reach the VET system because of difficulties accessing venture capital and government funding, difficulties scaling and a lack of co-ordination between actors in this space. Many of the same challenges were discussed in an OECD report (Touzet, 2023[46]) exploring the use of AI to support people with disability in the labour market, which concluded that many promising AI solutions fail due to difficulties establishing a sustainable business model.

Yonah Welker described the typical path to commercialisation, based on his own experience working with start-ups developing assistive technologies. Start-ups will bootstrap at first, supplementing where they can with university grants and competition awards, to develop and to ensure compliance with the relevant standards and frameworks (e.g. AI, medical, disability rights). This process can be lengthy; he has seen this process last 10 years for one European start-up developing a tool to support learners with ASD. Attention from venture capital funds only arrives at a later stage and the venture capital process for assistive technologies can be lengthier than for other products, requiring sustained effort and investment and multiple prototypes. Pavan Konanur, co-founder of Hoja AI, spoke about how the funding journey for the education platform has been challenging. At the beginning, they bootstrapped with their own savings to get to testing/validation stage, before attracting additional funding from family and friends. They are still on the path to commercialisation, talking to investors, investigating grants and participating in some accelerators which provide free LLM tokens.

One barrier to accessing venture capital funding can be the perceived small size of the market (i.e. neurodivergent learners in VET and/or in general education) and associated commercial potential. It is not enough to demonstrate that a new tool addresses a real need, according to Motti Sigel of MassChallenge; venture capitalists must see business traction in the form of a defined market with paying customers. Yonah Welker agreed that the small size of the market was often a reason for venture capital firms not to invest in assistive technologies but he also felt that this was a distorted view of the market, which ignores benefits for other segments of the population. For instance, tools developed to support young neurodivergent people in VET could also benefit a huge number of older people with cognitive decline. However, Clayton Lewis was generally sceptical of the profitability of technologies targeted specifically at people with disability and/or neurodivergences and thus sceptical that tools that meet their needs would emerge from the market without additional public and philanthropic funding.

> *"My guess would be the main barrier to these assistive technologies would not be the technology, it would be 'who's the payer?'" – Motti Sigel, Managing Director, MassChallenge Israel*

Public and NGO funding can be necessary to align development with the public interest. Yet a few interviewees identified flaws in these systems. Francesc Sistach, whose organisation Specialisterne helps people with ASD and other neurodivergences to find employment, described how government grants were insufficient for organisations such as his to develop and implement AI. Speaking about a recently awarded EUR 90 000 grant, he said that this money would be useful for improving the existing e-learning system, but that developing any advanced AI tool, such as a virtual coach, would require 10 times as much. Government and NGO funding for innovation are often more accessible to non-profit organisations than for-profit organisations, according to Brad Tombling, Chief Operating Officer at Bud Systems, a training management platform for apprenticeships and skills delivery. In the past, they have benefitted from the United Kingdom's R&D tax credits but these become less generous and less viable sources of funding as the company grows.

> *"That help is very good, but with €90,000 we are not going to develop a training system with artificial intelligence" – Francesc Sistach, CEO, Specialisterne Global*

For many tools aimed at the VET and broader education sector, scaling relies on securing a government contract. Yet many startups underestimate how difficult this is to achieve, according to Motti Sigel. He explained that procurement in education is slow and risk-averse, particularly in countries with centralised systems. In his view, NGOs and local intermediaries were often more agile partners. Another way for startups to scale is to integrate their product into an existing platform, according to Cristina Anamaria Costescu, but this may involve concessions.

> *"If a founder came in and they say 'Listen, I think this is amazing. I want the Minister of Education to sign a contract with me'. I would tell him that that's laughable. That is never going to happen" – Motti Sigel, Managing Director, MassChallenge Israel*

Good communication and co-ordination between market actors across commercial, non-profit, research and open-source environments could help promising technologies thrive. Yet these actors are not well connected, according to David Banes. The consequence is that many useful research findings remain behind paywalls, limiting knowledge transfer and innovation. However, Yonah Welker suggested that there have been improvements in the funding ecosystem in the last five to seven years, with better co-ordination between accelerator programmes, community and governmental programmes and different foundations. For instance, venture verticals have emerged wherein big pharma, medical or educational companies partner with existing startup accelerators to incubate cohorts of assistive technologies.

## Many tools do not meet the real needs of VET institutions, teachers or learners

Many tools that do make it to market do not align with the real needs of VET institutions, teachers and learners, according to interviewees. This criticism was applied to mainstream tools – in which accessibility is a by-product rather than a first intent – as well as to assistive technologies specifically aimed at learners with disability and/or neurodivergences. Susan Scott-Parker explained that the needs of learners with disability and/or neurodivergences are often overlooked in a rapidly evolving market.

> *"There has to be a point where we follow the needs of the user, not the excitement of the developer" – Susan Scott-Parker, Founder of Business Disability International*

Interviewees explained that mainstream tools are generally designed for the "standard user" and therefore often fail to cater for diverse cognitive and communication needs. Elisabetta Bertola described how various messaging, social platforms and productivity suites assume neurotypical users and offer only a "one-size-fits-all" interface. A narrow focus on profitability means that features like simplified language, lower reading levels or support for executive function are often missing, according to Nathaniel Cook.

> *"A lot of developers are not thinking of use cases for anybody with a disability, including those who are neurodiverse. They also wouldn't think of people who are elderly, who experience memory loss and so on. So we do have this problem that the data and the use cases that they're building are very, very mainstream and often exclude the outliers and particularly people with disabilities" – David Banes, David Banes Access and Inclusion Services*

A number of interviewees spoke about the misalignment between LLMs and the needs of VET institutions, teachers and learners. One source of misalignment highlighted by Helen Nicholson-Benn is that these tools were not designed originally for education. While she welcomed OpenAI's announcement of a 5-year project whereby they will work with 400 000 teachers in the US, she wished that LLM developers had engaged with the education sector on issues of safety and accessibility at an earlier stage. Efforts to retroactively fit a tool to the needs of a sector and to diverse user needs are welcome but not ideal. Even though generative AI chatbots such as ChatGPT, Gemini and Perplexity are generally considered intuitive and accessible, they often produce outputs which can be overly wordy for neurodivergent learners, unless specifically prompted not to, explained a Curriculum and Learning Manager at Tech Kids Unlimited. Nathaniel Cook mentioned that the Special Olympics had built prompt libraries for people with disability and/or neurodivergences to use to instruct generative AI chatbots to simplify or otherwise adapt language, a workaround that would not be necessary if the relevant configurations were already available. Veronika Kaska described as common the experience where misalignment between tools and needs requires additional (financial and other) resources to adapt them.

Another source of misalignment is that AI appears to serve certain languages and contexts better than others. Interviewees noted that generative AI chatbots and screen readers perform much better in well-resourced languages such as English than in other languages, so not all learners benefit equally. This is a function of the amount of text in each language available online to train the AI, which can not only drive differences in quality but can also imbue the model with conventions, styles, biases and narratives associated with those languages. According to Yonah Welker, ChatGPT is driven by 400 billion texts in English, 1 000 times as much data as the 400 million texts in Hungarian, with the result that accuracy on topics relevant for the Hungarian context will be much lower. The context in which the technology is developed can also shape how the tool works: assistive technology tools developed to meet the needs of neurodivergent learners in the United States community colleges may not be suited to the VET context in Germany, for example.

> *"Let's say you try to introduce some assistive technology in Slovenia or Romania… in some smaller languages, the quality and accuracy will be smaller" – Yonah Welker, Public Technologist and Visiting Lecturer*

Although assistive technologies are designed to serve people with disability and/or neurodivergences, they too can fail to meet user needs. One issue (discussed in Chapter 4) is that as LLMs are increasingly embedded in assistive technologies, ableist biases present in the data used to train the models could seep in if users' needs are not centred. Similar issues were identified in an OECD study (Touzet, 2023[46]) exploring the use of AI to support people with disability in the labour market, in which lack of engagement with the end-user in the development of assistive technologies was the most commonly cited barrier to adoption.

Designing assistive technologies to be inclusive of all needs, following universal design principles, comes with its own tensions and practical challenges. Alisdair Gurling described how trying to serve the needs of learners with ASD and learners with ADHD could drive developers in opposite directions. Ricardo Rosas spoke about his own experience trying to implement universal design principles in a project but ultimately concluding that it was not possible to develop the tools in a way that served both deaf and blind users simultaneously.

> *"Universal design can be insufficient because sometimes the need of someone with ASD is in tension with someone with dyslexia or ADHD for instance: sensory overwhelm on one side and desire for novelty and engagement on the other" – Alisdair Gurling, researcher at Wonderlab, Monash University*

How the technology aligns with existing teaching methods is also important. In explaining why VR and AR tools are not yet widely used in educational settings despite their potential (see Chapter 2). Kevin Gonyop Kim, a Professor for Spatial Computing and 3D Technologies, described a fundamental misalignment between VR headsets and the one-to-many classroom dynamic, in that headsets physically block sight and communication between the teacher and their students, and between students. While they could facilitate other forms of learning (e.g. one-to-one tutoring, distance or independent learning), they seem incompatible with current classroom-based VET. He saw other forms of spatial computing, for instance based on projections or holograms, as more promising technologies for a collaborative classroom dynamic. Other interviewees raised concerns about the limited availability of software suitable for VET. For instance, Brad Tombling, COO of Bud Systems, expressed the view that simple tools like text-to-speech, speech-to-text could have more impact than large Augmented Reality projects, which are likely to be too costly to develop and implement in a VET context.

## Tools are not well integrated with each other

According to interviewees, insufficient integration between mainstream and assistive technologies limits their potential to assist neurodivergent learners in VET. This is referred to as interoperability and was also highlighted as a barrier to the adoption of AI to support people with disability in the labour market, in previous OECD research (Touzet, 2023[46]).

Interoperability is a particular challenge when it comes to AAC software such as screen readers and speech recognition, as these tools change the way a person interacts with a device (e.g. a computer or a phone) and all its software. Elisabetta Bertola, AAC Specialist Co-ordinator at Irisbond, described a stark divide between specialist AAC and mainstream software (e.g. messaging, social platforms and productivity suites). In her view, each sits in a separate niche, designed with a separate audience in mind, evolving according to its own timeline, with little crossover. As well as limiting interoperability between the two sets of solutions, this divide also slows innovation in AAC software and prevents mainstream tools from understanding and catering to diverse needs. Alisdair Gurling described many technologies in this space as “little walled gardens” and provided a vision of what voice assistants could offer if these walls could be broken down: a VET learner with ADHD could ask their voice assistant about the day’s schedule and the assistant would draw on to-do lists and calendars from all relevant systems on the device, not only those affiliated with the brand of the voice assistant.

Limited interoperability also hinders the transition from training to work. Access to assistive technology is often tied to institutions meaning that individuals lose access to useful tools once they leave VET, according to Susan Scott-Parker. There are a few exceptions that try to preserve continuity. For example, according to Nicole Lonican from FIT in Ireland, their Cuimsiú programme provides multi-year licences and mentoring after participants move into jobs. However, interviewees stressed that such practices are not widespread, leaving many learners without their supports at the point of transition. Even where the individual retains access to their preferred tool, the new employer may object to the tool being used on its processes and on its devices. Interoperability poses practical challenges for employers that wish to deploy assistive technology, according to Neil Milliken, as the process of ensuring interoperability at employer level is complex and time-consuming. For this reason, many employers will prefer to support only a limited selection of AAC tools and may be reluctant to switch to new solutions even if they seem to hold promise.

> *“One of the challenges that new assistive tech providers have is actually the technology may be a great idea, but if it doesn't integrate with the environment which someone is studying in or working in, it is only partially useful” – Neil Milliken, Global Head of Accessibility and Digital Inclusion at Atos*

# 4 Risks in using AI and other advanced technologies to support neurodivergent VET learners

While AI and other advanced technologies offer new opportunities to support neurodivergent learners in VET, their use also raises a range of ethical, pedagogical and societal risks. Tools that collect and process learner data raise privacy risks while AI can replicate and perpetuate existing biases. Discrimination against neurodivergent individuals is a serious harm associated with these risks. Educators highlight the propensity for generative AI to foster misinformation and are concerned that overreliance on technology more generally could ultimately hinder the development of skills that VET learners will need to transition to work. Meanwhile, teachers' concerns about AI-assisted cheating risks constraining the legitimate use of assistive technologies that were previously sanctioned. The socio-emotional risks associated with generative AI chatbots and robots are not yet fully understood, not least for neurodivergent learners. Importantly, the use of AI and other advanced technologies could inadvertently lead to exclusion and widen the gaps that already exist. Many of these risks are not specific to neurodivergent learners in VET – similar risks have been outlined in previous OECD work focussing on equity and inclusion in education (Varsik and Vosberg, 2024[43]), on the use of AI to support labour market inclusion of people with disability (Touzet, 2023[46]), and on the use of AI in training (Verhagen, 2021[49]) – but some of the risks and harms can be heightened for this group.

## Tools that collect learner data raise risks related to privacy

While data collection enables adaptive learning, it also raises risks related to data privacy, which were often top of mind for interviewees. Although the harms associated with data protection and privacy violations are not limited to neurodivergent learners, the risks and harms could be amplified for them due to the sensitivity and nature of some of the data collected. In VET, additional privacy risks arise when data are shared between schools, training centres, and employers during apprenticeships or work-based learning, where responsibilities for data protection are often unclear. OECD research (Touzet, 2023[46]) notes that "the current privacy protections don't work if you are highly unique". At the same time, some interviewees were concerned that an overly prescriptive approach to these risks could leave neurodivergent VET learners deprived of genuinely useful tools.

Some of the main data privacy risks highlighted by stakeholders include:

- **A lack of transparency around what personal data is collected and stored by generative AI tools.** One interviewee noted that this was identified as a high risk associated with Microsoft 365 Copilot in a 2024 Data Protection Impact Assessment (DPIA) conducted by SURF (Privacy Company, 2024[50]), a co-operative of Dutch education and research institutions dedicated to ICT innovation. The co-operative first advised education and research institutions against using the tool

entirely but updated this in 2025 to advise exercising caution when using the tool, after having engaged with Microsoft to resolve some of the risks.

- **Data being collected for one purpose and used for another.** Some interviewees expressed concern about the potential misuse of data collected through tools designed to support neurodivergent VET learners. Janus Asko (EyeJustRead) described his concern that competitive pressures within the edtech market could eventually push small companies to sell their model and/or their user data to larger AI developers to improve virtual assistants and contrary to original intentions.[8] Colm McNamee put the spotlight on the hidden costs of "free" services, while also warning about large tech providers and IP misuse; he added that the European Union is taking a comparatively progressive, "soft" regulatory approach in this space.

> *"I do have huge concerns about some of the large tech providers […] as someone said, if something is free, you're the product" – Colm McNamee, Cuimsiú Employability Mentor, FIT*

- **The sensitive nature of data relating to disability status, neurotype or physical and emotional state of the learner.** Health-related data is considered within GDPR to be "sensitive" and thus subject to specific processing conditions. Nasser Siabi and Marius Frank warned about this data being stored permanently and leading later to discrimination in education, employment or health insurance outcomes.
- **Monitoring and surveillance associated with the use of AI-enabled wearables and AR tools.** Robert McLaren explained that these tools would capture – whether intentionally or not – a very detailed picture of how a person works and/or studies, where they are at all times, and what they are doing. As a result, a neurodivergent worker or learner could be subject to a much greater degree of surveillance than their neurotypical peers, which could create disparities in how performance or learning outcomes are evaluated.
- **Privacy risks for individuals other than the worker or learner.** Geena Vabulas gave an example of smart glasses being used to support a learner working in a care home, collecting sensitive information on the patients being cared for. While not raised by any interviewee as a major concern, interviewees did note that even more benign-seeming tools for recording and transcribing lectures can have implications for lecturers' and teachers' privacy (as well as their intellectual property).

While privacy risks were widely acknowledged, some interviewees noted the challenge in striking the right balance; protecting privacy rights of neurodivergent learners without depriving them of useful tools. Yonah Welker described some initial worry in the assistive technology and ASD communities that useful emotion-recognition assistive technologies would be caught up in a ban under the EU AI Act on the use of AI systems to infer emotions in workplaces and education institutions. An exemption was ultimately included in the EU AI Act to clarify this issue and to explicitly permit the deployment of emotion recognition for medical or safety reasons.

David Banes suggested that the risk-benefit ratio could be different for people with and without disability or neurodivergences. If AI and other advanced technologies live up to their potential in enabling neurodivergent people to participate fully in VET and in the labour market, then people with neurodivergences could be more willing to accept privacy or security risks in exchange for the advantages. This has implications for policymakers: if they legislate on the basis of the risk-benefit ratio for the neurotypical population, then they could prevent neurodivergent people from accessing tools that are genuinely helpful to them. If legislation is looser, this leaves neurodivergent people facing greater risk than neurotypical people. David Banes spoke of the importance of neurodivergent people having a voice in these discussions.

Some interviewees also noted that consent can become a practical challenge when using potentially helpful tools. Geena Vabulas described cases where uncertainty about whether a learner has capacity to consent to data processing, or whether a parent, carer or provider may lawfully consent on their behalf, leads staff to avoid using otherwise useful technology. She highlighted the value of tools that do not collect personal data and can be used without creating an account or ticking a consent box (for example, Goblin Tools), because they reduce administrative and legal friction.

## AI can replicate and perpetuate societal biases

Many interviewees spoke about the risk of bias associated with AI systems trained on historical data and thus primed to replicate and perpetuate societal biases, including assumptions about what counts as a "normal" body or mind. These ableist biases not only afflict AI-generated content but can also affect a learner's transition to the labour market when AI is used in recruitment tools. Similar risks were highlighted in a recent OECD report (Touzet, 2023[46]) on the use of AI to support people with disability in the labour market, which identified two main sources of bias: that people with disability and/or neurodivergences are excluded from datasets used to train AI and that training data can reflect embedded ableist biases that are being scaled and magnified through AI.

The first issue is the lack of diversity in the underlying data. Neil Milliken explained that since AI systems work by identifying patterns, they are well suited for classifying information that has been observed many times in the historical data. In this paradigm, people with disability and/or neurodivergences will be considered "statistically insignificant" and thus either excluded from classification or classified with much less precision than people without disability and/or neurodivergences.

The second issue is ableism within the underlying data. According to Nathaniel Cook, current generative AI systems reflect embedded bias, including ableist assumptions, due to being trained on internet data. He observed that these systems tend to offer individuals with intellectual and developmental disabilities help with life skills rather than business skills, thereby showing an imbedded assumption that these individuals are less capable. Rohan Slaughter expressed concern that the same ableist attitudes could potentially seep into AAC tools if LLMs are imbedded into these tools without care or without consulting users.

> *"I'm willing to bet that every single LLM or AI that we utilise today was trained on the internet. And if you've ever used the internet, it is not a place full of acceptance and tolerance for people with intellectual and developmental disabilities" – Nathaniel Cook, Chief of Information and Technology, Special Olympics*

Many interviewees expressed concern about AI being used in recruitment because of the potential for discrimination and harm when using a biased system for decisions that directly affect an individual's livelihood and ability to transition to the labour market. Many of the same concerns would also logically apply to tools that match VET learners to educational opportunities. For example, bias in guidance, admission or tracking systems used in VET could reinforce the historic under-representation of neurodivergent learners in higher-level or prestigious vocational tracks. At the screening stage of the recruitment process, AI-enabled recruitment tools will often favour a profile that matches those already in the job, according to Michael Fembek (CEO, Zero Project, Essl Foundation), while anything that diverges from the norm raises a red flag. Thorkil Sonne explained that this rigidity will naturally screen out many neurodivergent VET learners, including for example, learners with non-traditional educational or career paths, or those job applicants with ASD who prefer not to boast about their achievements. At the interview stage, AI-enabled video interview platforms introduce further risk of bias if they are designed to value neurotypical behaviours. For example, Neil Milliken and David Banes both spoke of their concern that a difficulty maintaining eye contact with the camera could be misinterpreted and ultimately lead to exclusion.

## Generative AI can foster misinformation

Interviewees highlighted the danger of neurodivergent VET learners relying on generative AI that often provide incorrect, inconsistent or compromised information. Generative AI is trained using large amounts of online data, which can include biased, incomplete and unverified information.[9] Moreover, generative AI has a widely acknowledged tendency to "hallucinate" and to pander to the user's demand rather than responding "I don't know". Interviewees were concerned that AI-generated misinformation could compromise VET learners' ability to learn and actively mislead and deceive them. Some interviewees suggested that neurodivergence could make learners more susceptible to the risk of misinformation. Many interviewees agreed on the need to review generative AI outputs for accuracy. -

A related issue is the capacity for new AI models to generate images that can pass for real photos and video footage. Freya Bevan described deepfakes as a worldwide problem to which young students could be particularly susceptible.

> *"Teenagers are very susceptible to what they see, so sometimes it's just a case of seeing something and believing it, which is the case with many things, you know, like social media and all these trends on TikTok" – Freya Bevan, Digital Learning Coach with AI focus, Gloucestershire College*

David Banes was concerned about the potential for commercial influence in algorithmic recommendations, particularly for free-to-use tools. He explained that users – especially those with cognitive disabilities – may find it difficult to recognise when an AI response is influenced by commercial sponsorships (e.g. recommending a specific product) and may accept answers at face value, thinking that the information they receive is independent and objective.

## Overreliance on technology could hinder learning and skill development in VET

One of the main concerns for interviewees was that overreliance on AI and other advanced technologies would prevent neurodivergent learners from developing the skills that VET was supposed to equip them with, leaving them underprepared for the transition to work. Overreliance could also negatively affect learners' educational outcomes if learners are not permitted to use the same tools in tests and assessments as they use in their usual learning environment(s), for instance if the national or regional body responsible for assessment comes to a different decision to the VET institution or employer. Interviewees were concerned that overreliance on technologies, and on AI in particular, would come at the expense of critical thinking skills as well as basic skills such as writing and spelling.[10] While this is a wider issue affecting all learners, the risks of overreliance on AI could be higher for individuals with learning disabilities, data processing issues or language challenges precisely because it is so powerful as an assistant for these individuals, according to Christopher Patnoe.

This is particularly dangerous, a few interviewees remarked, because critical thinking skills are the precise skills that any learner needs to use AI effectively and safely. Pierre Dillenbourg spoke of the importance of training apprentices so that they can work autonomously. For instance, if an apprentice carpenter always uses a tool to calculate the forces on beams of a house, there is a risk that they do not learn to apply their own assessment and reasoning, steps necessary to verify that the tool has proposed the correct solution.

Where VET learners already struggle with social interactions due to neurodivergences, they may welcome the chance to interact with a machine rather than a human. Yet these interactions may hold them back from developing social skills. Aida Nazari from LuxAI, a social robotics company, spoke of concerns that the use of robots among learners with ASD could ultimately hinder their ability to interact with humans, not only because time interacting with robots is time spent not interacting with humans, but also because interactions with robots could be so comfortable and appealing that learners with ASD could lose the

willingness to interact with humans. This concern is why LuxAI is built around a triangular relationship involving a robot, child and an adult teacher or parent.

In the same vein, interviewees warned that overreliance on generative AI chatbots could prevent neurodivergent VET learners from developing social skills that would be useful for them in the workplace. David Voss explained that generative AI chatbots, unlike humans, do not provide a multi-voice view, do not contradict the user, and rarely say they do not know the answer. He outlined his worry that neurodivergent individuals who relied on generative AI chatbots throughout their VET training could enter the workplace unprepared to approach colleagues with questions, and unprepared for nuanced, ambiguous or challenging answers. He explained that while studies have suggested that the use of avatars in classroom settings can improve participation, there is still a legitimate debate about whether intervening to remove challenges such as this for neurodivergent learners could leave them inadequately prepared for life's challenges later on. A similar point was raised by Ann Kennedy, a tutor in further education, who encourages her computer science students to use AI for website design but insists that human interactions are crucial to understand a client's needs and to deliver a website that meets those needs. To impart this important principle, she sets an exercise for students consisting of making a website centred around her niche interests so that the students must think outside their own comfort zones and must consider the client's needs.

Similar questions surround the use of tools to enhance focus, typically aimed at individuals with ADHD. Alisdair Gurling wondered whether these tools, which he uses himself and finds very helpful, could ultimately reduce an individual's internal capacity to focus if relied on too heavily.

> *"The wider concern I think going forward is that some people's internal capacities don't grow and not only do they not grow, they might atrophy, they might actually diminish" – Alisdair Gurling, researcher at Wonderlab, Monash University*

## Concerns about AI-assisted cheating risks constrain the legitimate use of assistive technologies

Related to the topic of overreliance are concerns about generative AI chatbots undermining academic integrity by facilitating cheating and plagiarism. These concerns were raised by many interviewees, who spoke of the unresolved question within VET and the wider education system about how to fairly assess students when these tools are so readily available. While this has implications for all learners, a handful of interviewees noted the risk that efforts to address AI-assisted cheating and plagiarism could bring suspicion upon neurodivergent learners, particularly those with dyslexia, who depend on assistive technologies for writing.

A few interviewees referred to the tool, Grammarly, to describe the challenge. Grammarly is a longstanding writing assistance tool, which has recently embraced generative AI, meaning that the tool can generate suggested text on top of its original features focussed on spelling and grammar. Helen Nicholson-Benn explained that while many users would consider this a significant enhancement, it also increases the complexity of using Grammarly in education because of widespread concerns about AI-assisted cheating and plagiarism. David Voss pointed to instances where assignments written with the aid of such tools have been flagged by plagiarism detection platforms and the users penalised. Interviewees described uncertainty among users of this and similar tools about whether use was permitted under their institutions' rules and anxieties that they could be unfairly accused of cheating.

Developments such as this add to a more general uncertainty regarding the use of assistive technologies in assessment. Rohan Slaughter described how, even for the same learner, decisions regarding the use of assistive technologies in assessments can vary between subject and between exam board. In a VET context, it is also possible that an examination board comes to a different decision to the VET institution or

employer. Not only does this incur an administrative burden for examination officers and teachers, but difficulties interpreting the rules can discourage learners from seeking support. Rohan Slaughter noted that better guidance for examination boards is emerging on how to make assessments more accessible and on what principles to follow in authorising assistive technologies. Generally, authorisation depends on what is being assessed. For example, a learner with dyslexia may be authorised to use a writing assistance tool in an assessment testing technical knowledge but not in an assessment testing literacy skills.

## The socio-emotional risks associated with generative AI chatbots and robots are not yet fully understood

Greater interaction with AI and other advanced technologies could affect mental health and socio-emotional development in ways that are not yet fully understood. A recent OECD report on the potential impact of AI on equity and inclusion in education (Varsik and Vosberg, 2024[43]) highlights the potential negative implications of AI for socio-emotional learning, such as a reduction in human interaction, which can erode students' sociability, sense of trust and empathy, and lead to loneliness and isolation. In the most alarming cases, recent newspaper reports (OECD[51]) have tied use of generative AI chatbots for psychological support to incidents of violence, suicide and psychosis.[11] Interviewees expressed concern about the potential socio-emotional implications for neurodivergent VET learners.

Interviewees suggested that some neurodivergent learners could be overly trusting in generative AI chatbots, overlooking "hallucinations" and ending up more exposed to harmful content. David Voss and Eleni Damianidou identified learners with ASD as one group that could be overly trusting of AI outputs. However, Eleni Damianidou was careful to note that this risk also applied to interactions with other humans – in particular, that trust can lead students with ASD to fall victim to classmates who mislead and have malicious intentions – and that the risks of AI should be evaluated within this context when compared with the benefits.

> *"There's a risk that certain types of autistic learners could take what they're given a bit too, not literally, but truthfully. They really believe that it's the correct information because it's been given to them from an AI. Maybe that's because an AI is a little bit more interactive than a Google search" – David Voss, who works on digital learning in higher education*

Interviewees also highlighted possible harms for mental health if neurodivergent learners form emotional attachments to humanoid robots or generative AI chatbots, believing they possess genuine emotional understanding. For some neurodivergent (and neurotypical) learners, conversations with chatbots may allow them to temporarily retreat from a stressful world and unload worries and frustrations as they navigate adolescence and the transition to adulthood. The danger for potentially harmful interactions emerges, according to Elisabetta Bertola, because these chatbots have not been designed to protect people in these circumstances and to take into account various vulnerabilities, neurodivergences, disabilities or needs. Additionally, if interactions with digital interfaces displace interactions with other humans, the learner will become further isolated. Another danger, according to Lorenzo Desideri, is that if a humanoid robot suddenly malfunctions or powers down, or if a subscription to a generative AI chatbot lapses, the learner may experience feelings of abandonment or betrayal. As AI advances and as the boundary between human and artificial intelligence blurs, these dynamics become more difficult to navigate.

## Exclusion can be an unintended consequence of these technologies

Although interviewees generally spoke about the potential of AI and other advanced technologies to support the inclusion of neurodivergent learners in VET, some interviewees noted that they could undermine this principle in unintended ways, widening the gaps that already exist. For instance, exclusion can result from discrimination based on bias (discussed earlier in this chapter) and can also result where cost, connectivity or language act as a barrier (discussed in Chapter 3). In VET, such unintended exclusion can also stem from unequal access to digital infrastructure across training centres and workplaces, reinforcing regional and sectoral divides that already limit participation of disadvantaged learners. Michael Fembek spoke of the risks of exclusion associated with telepresence robots for those that cannot physically attend school (due to anxiety or other health needs for example). The robot gives the learner a presence in the classroom and the means to ask the teacher questions and to see other classmates. While this is clearly better than being excluded from school entirely, Michael Fembek made the point that telepresence was still inferior to physical presence when it came to feeling that one belongs in the classroom community. The concern is that these tools, notwithstanding their advantages, could slow learners' reintegration into the classroom and work against the objective of adapting schools to be truly inclusive of all needs.

Among the many other risks highlighted by interviewees were the environmental impact, implications for intellectual property rights (of teachers but also in relation to the content used to train the models), the potential for AI to displace labour (affecting teachers but also the idea that VET learners will be transitioning into a disrupted labour market).

# 5 Policy guidelines

This chapter identifies policy guidelines (summarised in Box 5.1) to help governments seize the potential of AI and other advanced technologies to support neurodivergent learners in VET (Chapter 2) while overcoming barriers (Chapter 3) and addressing the associated risks (Chapter 4). The guidelines are accompanied by insights and practices captured during stakeholder interviews, desk research and a workshop bringing together additional stakeholders engaged in VET and disability policy.

### Box 5.1. Policy guidelines for using AI and other advanced technologies to support neurodivergent VET learners

Apply existing frameworks governing accessibility, disability rights, AI, data privacy etc., by for instance:

- Reviewing existing frameworks in the context of the latest advances in AI and other advanced technologies
- Providing guidance on how to interpret existing legislation in the context of the latest advances in AI and other advanced technologies
- Developing and promoting technical accessibility standards for AI-enabled tools used in VET
- Including neurodivergent voices in discussions about regulation and governance of AI and other advanced technologies

Prepare and support VET teachers to use AI and other advanced technologies to support neurodivergent learners:

- Including training on assistive technologies, including AI and other advanced technologies, in initial teacher education
- Leveraging continuing professional learning to keep in-service VET teachers' skills up to date and ensuring that instruction adapts to the needs of the labour market
- Promoting a culture of innovation among teachers and encouraging VET institutions to do the same

Help neurodivergent learners, VET institutions and employers to navigate the many AI and other advanced technologies available, by for instance:

- Providing information and guidance to help learners, teachers and employers keep pace with new tools, and to choose the right tools for their circumstances
- Encouraging VET institutions to provide clear guidelines on use of AI and other advanced technologies to learners on how they can use generative AI and writing assistance tools without breaching plagiarism rules
- Facilitating partnerships among VET institutions and centralised evaluations and procurement processes to select tools
- Advancing research on the use of AI and other advanced technologies to support neurodivergent learners in VET

Fund assistive technologies and support the assistive technology ecosystem, by for instance:

- Using government funding to support socially beneficial innovations and to bridge education and employment gaps.
- Supporting innovation by funding pilots
- Fostering healthy assistive tech ecosystems at regional, national and international levels

Encourage developers to improve the accessibility of AI and other advanced technologies and to better align them with the needs of neurodivergent learners, by for instance:

- Encouraging developers to engage neurodivergent learners (plus their parents, teachers and support professionals) in the development and testing of tools intended to serve their needs
- Encouraging the companies developing these tools to train developers about accessibility and bias

Use AI and other advanced technologies to help achieve more responsive, inclusive and innovative VET systems, by for instance:

- Making VET more responsive with data and AI
- Keeping VET relevant amid rapid technological change through employer engagement and work-based learning
- Using AI and advanced technology to broaden accessibility and inclusion in VET

## Apply existing frameworks governing accessibility, disability rights, AI, data privacy etc.

Existing frameworks, ranging from legislation to "soft law" (which sets standards but is not enforceable), provide a starting point for using AI and other advanced technologies to support neurodivergent VET learners, while addressing the risks. Some interviewees expressed appreciation for EU legislation, such as the EU AI Act, GDPR and the European Accessibility Act. Colm McNamee described the European Union as playing a leading role in regulating issues such as ethical, data and environmental concerns associated with AI through soft power and standard setting. Veronika Kaska saw the EU AI Act as important because it sets minimum standards for AI-enabled tools used in education, while Kellie Mote mentioned that the European Accessibility Act had been successful in bringing attention to digital accessibility. Governments can apply existing governance frameworks by:

**Reviewing existing frameworks in the context of the latest advances in AI and other advanced technologies.** Rapid technological developments raise the possibility that gaps could arise or that regulatory frameworks could unintentionally block useful innovations (e.g. in highly personalised learning or emotion recognition tools to support learners with ASD).

**Providing guidance on how to interpret existing legislation in the context of the latest advances in AI and other advanced technologies.** Developers and deployers (including employers and VET institutions) of these tools could benefit from guidance on how to interpret and comply with existing legislation, such as the EU AI Act and GDPR. Yonah Welker mentioned an audit tool, currently being developed by a startup, which aims to help SMEs working on assistive and medical technologies create documentation to demonstrate compliance.

**Developing and promoting technical accessibility standards for AI-enabled tools used in VET.** Just as web accessibility standards (e.g. Web Content Accessibility Guidelines (WCAG)) explain how to make web content more accessible to people with disability, Sandra Fomotškin and David Banes suggested that technical accessibility standards could be developed for AI-enabled tools in VET.

**Including neurodivergent voices in discussions about regulation and governance of AI and other advanced technologies.** David Banes made the point that if policymakers legislate on the basis of the risk-benefit ratio (e.g. regarding privacy and security risks) for the neurotypical population, then neurodivergent people could be denied access to tools that are genuinely helpful to them.

## Prepare and support VET teachers to use AI and other advanced technologies to support neurodivergent learners

Interviewees highlighted a need to prepare and support teachers (including trainers) to use these tools to support neurodivergent learners in VET. Not only would this enable teachers to use the tools pedagogically and effectively, but it would also help them to choose the most suitable tools, to know when to use them and when not to use them, to address risks and to transmit their knowledge to students. Having teachers with up-to-date knowledge and skills is a key component of responsive VET systems, according to an OECD report on building future-ready VET systems (OECD, 2023[31]). As well as preparing and supporting VET teachers to respond to neurodiversity more generally, VET systems should equip teachers and potentially align pedagogy by integrating assistive and advanced technologies into initial teacher education and continuing professional learning, with practical, classroom-ready guidance, model lesson plans and safe-use protocols, including how to scaffold use for neurodivergent learners and adapt assessment where needed (OECD, 2025[52]; OECD, 2023[31]). Governments can equip VET teachers with the necessary skills and knowledge by: **Including training on assistive technologies, including AI and other advanced technologies, in initial education for teachers and support professionals.** Rohan Slaughter outlined the different skill levels required for different profiles: (1) basic awareness of assistive technology tools and how they work for all teachers, (2) higher-level training for SEN teachers, occupational therapists and speech and language therapists, (3) specialist programmes to develop expert assistive technology practitioners for SEN and further education institutions. According to previous OECD research (2023[31]), the value of simulators, VR and other digital tools in classrooms and workplaces is realised when they are tied to clear learning goals and occupational standards. Training would need to account for the fact that prospective VET teachers and in-company trainers come from varied backgrounds, including from industry, and come equipped with varied levels of digital skills and AI literacy. Susan Scott-Parker suggested that teacher certification processes could include training on assistive technologies.

**Leveraging continuing professional learning to keep in-service VET teachers' skills up to date and ensure that instruction adapts to the needs of the labour market.** In Estonia, training on AI use for (primarily non-VET) teachers has begun via AI Leap, with beginner-level workshops led by educational technologists, according to Sandra Fomotškin, who noted plans to extend the programme to VET teachers by 2026. Some VET institutions already provide training on AI and other advanced technologies to teachers. Luovi Vocational College offers monthly online training sessions, an internal knowledge hub and digital events open to external students and teachers.

**Promoting a culture of innovation among teachers and encouraging VET institutions to do the same.** Lorenzo Desideri and Thomas Köhler called for teachers to be given more freedom to explore the use of AI and advanced technologies. Piia Jokelainen described how Finland's Ministry of Education recently issued AI guidelines, supporting the use of AI in education in principle. Collaboration platforms are also enabling more coherent delivery across learning sites, for example through shared logs, multimedia evidence and joint assessment spaces. This supports workplace-embedded projects and faster iteration of teaching materials. Kevin Gonyop Kim highlighted that projection-based AR and shared 3D environments are often more workable than individual headsets for group learning and that AI can lower barriers by auto-generating VR or AR content and supporting teachers through conversational build tools. Open 3D libraries allow teachers to reuse high-quality models in practical subjects, which helps extend

innovation beyond academic domains. Policy should also address disparities in digital capacity across VET institutions to ensure that innovation benefits all learners, not only those in well-resourced centres.

## Help neurodivergent learners, VET institutions and employers to navigate the many AI and other advanced technologies available

Interviewees described how governments could help neurodivergent learners, VET institutions and employers navigate the many AI and other advanced technologies available by providing information, facilitating partnerships between VET institutions and furthering research on the potential of AI and other advanced technologies to support neurodivergent learners in VET. Governments can help these groups navigate the many AI and other advanced technologies available by:

**Providing information and guidance to help learners, teachers and employers keep pace with new tools, and to choose the right tools for their circumstances.** Neil Miliken highlighted the need for reliable catalogues of tools that are regularly updated. According to Susan Scott-Parker, a "buyer's guide" is urgently needed – not just a list of tools, but guidance on how to evaluate, select and justify purchasing decisions. Geena Vabulas called for stronger government involvement in filtering, curating and disseminating trustworthy information about available tools. Kevin Polley (Digisprong) reported that the Flanders Government has provided a collaborative document outlining seven principles, including transparency, data privacy and cybersecurity, for schools to use to assess tools. In many countries, sectoral bodies or employer associations play a key role in co-ordinating VET provision and could also help evaluate and disseminate AI-based assistive technologies within their occupational domains.

**Encouraging VET institutions to provide clear guidelines on use of AI and other advanced technologies to learners on how they can use generative AI and writing assistance tools without breaching plagiarism rules.** In the view of Yuwei Lin (Senior Lecturer, University of Roehampton), the most important aspect of this is providing practical guidance to learners on how to disclose when and how they have used generative AI. David Voss reported that his institution had recently produced a toolkit to provide transparency, including on the issue of plagiarism, for all students and teachers around the use of generative AI. Helen Nicholson-Benn described how her organisation Jisc is producing accessible, non-technical guides to help learners and their institutions to understand the tools, their features and how they might interact with existing rules.

**Facilitating partnerships among VET institutions and centralised evaluations and procurement processes to select tools.** Interviewees noted the advantages in terms of efficiencies and information sharing. Piia Jokelainen made the point that centralised evaluation of tools would be far less resource intensive than the current norm where each school is responsible for managing its own selection and implementation process. Her VET institution already participates in a national network of five special needs VET providers. Susan Scott-Parker suggested that government-convened procurement consortia across schools and VET providers could enable purchases at scale, cutting prices and widening access. In the United Kingdom, Jisc sets up licensing partnerships with providers of assistive technologies, enabling supports its members, further and higher education institutions, to benefit from lower prices. It also acts as an impartial advisor, publishing blog posts providing guidance on how to pick software right for each institution.

**Advancing research on the use of AI and other advanced technologies to support neurodivergent learners in VET.** According to Yonah Welker, research can help inform the public about the potential of AI, while correcting misconceptions and ultimately informing conversations about how to regulate AI used to support neurodivergent learners. This report highlights a number of areas where more research is needed, such as the long-term effects of the use of AI on skill acquisition and on social-emotional development for neurodivergent (and neurotypical) learners. Kevin Polley (Digisprong) noted that the

Flemish Government has launched a research call to assess the actual use of AI in schools, how it is being applied, and in which contexts. The European Vocational Training Association (EVTA) has established a new project, Recognise, with the aim to integrate AI tools into VET. The project will comprise a research phase on educational tools within VET, training for teachers and career guidance activities. Cristina AnaMaria Costescu called for government to support rigorous testing on available tools to enable neurodivergent learners to choose the best tools based on solid evidence. In the United Kingdom, the Westminster Department for Education commissioned computing experts at the University of Dundee (including interviewee Rohan Slaughter) to draft a competency framework for staff in special schools and colleges using digital assistive technologies (Slaughter and Griffiths, 2025[53]).

## Fund assistive technologies and support the assistive technology ecosystem

Interviewees agreed that government has a role to play in funding assistive technologies, supporting socially beneficial innovation and fostering healthy assistive technology ecosystems, especially for tools used in VET and other education pathways. Governments can support the assistive technology ecosystem by:

**Using government funding to support socially beneficial innovations and to bridge education and employment gaps.** Many interviewees called for higher funding to bridge education and employment gaps, since access to AI and advanced technologies for VET institutions, employers and individuals often relies on government funding. Interviewees made the point that government and public institutions should take an interest in financing AI and other advanced technologies that are accessible, equitable and proven to work, especially in VET, given the important economic and social role that it plays by engaging diverse learners, equipping them with practical and job-specific skills, and facilitating transitions from school to work. Clayton Lewis suggested that government funding could sustain tools that are effective but have limited commercial potential (e.g. due to the limited number of potential users), a point also made in previous OECD research (Touzet, 2023[46])). Pavan Konanur called for more public-private partnerships, highlighting the advantages in combining private sector technical expertise with public sector expertise on health and special education.

**Supporting innovation by funding pilots.** Interviewees saw government funding for pilots as a way to strengthen the evidence of assistive technologies' impacts, enabling the developers of successful pilots to attract further funding and to scale across VET. However, they suggested different approaches. Robert McLaren (Policy Connect) called for government to focus on large-scale pilots which could potentially show a large return on investment and thus lead to widespread integration of worthy tools across VET. Motti Sigel (MassChallenge) suggested that governments should focus on small-scale pilots, encouraging schools to experiment with new tools and rewarding measurable success, while minimising risk. Experimentation at VET institution level, which can put tools to the test in real learning environments, may be easier in countries and regions where institutions have more independence. Kevin Polley described a Flemish initiative, the Smart Education at Schools (SEATS) programme, whereby schools co-develop tools with tech partners based on local needs and aligned with real classroom challenges. Tools developed must be shared openly with other schools on an online platform, and tech companies can buy the solution to be further developed commercially (in which case the basic version must remain available for schools).

**Fostering healthy assistive tech ecosystems at regional, national and international levels.** Governments can play a role in fostering healthy assistive tech ecosystems, comprising: a diverse range of developers (labs, universities, start-ups, NGOs, social enterprises, large tech companies); accelerators and other development programmes to fund and scale initiatives; and policymakers who establish frameworks and regulations to ensure inclusion and safety. Yonah Welker spoke of the importance of decentralised and democratised systems where a variety of labs, testing environments and developers produce different assistive technologies – and avoiding the case where one large tech company

monopolises the market. In his view, EU funding programmes work well in this respect because they allow several labs and/or developers to collaborate on one technology. He also made the point that healthy national or regional assistive tech ecosystems would further help produce tools that are suited to local conditions, languages, VET systems and labour markets. Ricardo Rosas shared the view that international governance (e.g. by UNESCO) could help avoid fragmented efforts in developing AI tools, especially where the target populations are relatively small. He suggested convening a global consortium to set open technical and data standards, build shared training datasets, and publish validation and procurement guidance. His concrete example was AI sign-language avatars: several teams are developing similar tools in parallel, but without common standards and pooled investment these projects are unlikely to converge or scale across countries and languages.

## Encourage developers to improve the accessibility of AI and other advanced technologies and to better align them with the needs of neurodivergent learners

Governments can encourage companies developing these tools to actively engage neurodivergent learners in the process and to train developers about accessibility and bias, to address the concern that many tools currently on the market do not align with the real needs of neurodivergent learners in VET. Governments can do this by:

**Encouraging developers to engage neurodivergent learners (plus their parents, teachers and support professionals) in the development and testing of tools intended to serve their needs.** The needs and voice of the intended user need to be built in from the beginning rather than added as an afterthought, according to Kellie Mote and Colm McNamee. Co-design (i.e. collaborating with neurodivergent individuals in the design and development process) could help tools align better with needs. Kellie Mote highlighted the need to employ neurodivergent people in the tech industry and/or to pay them for their contributions to the tools they help develop and test. Cristina Anamaria Costescu (Babeș-Bolyai University) described co-design as crucial to all tools she has helped develop. Hiren Shukla described how Microsoft is currently engaging neurodivergent employees via EY's Neurodiverse Centre of Excellence in the testing of tools such as Copilot to ensure more inclusive design (e.g. determining where and how notifications should appear on the screen). Kellie Mote made the point that standards and compliance could also play a role: she suggested that a tool should only be considered "minimum viable product" if validated by a diverse user testing group, thus setting a benchmark for inclusion that products must clear before entering the market.

**Encouraging the companies developing these tools to train developers about accessibility and bias.** Previous OECD research (Touzet, 2023[46]) has called for computer science training to include modules on user experience design, human-computer interactions, and accessibility. An example of this highlighted in the report is Teach Access, a collaborative project between academia and the technology industry which aims to integrate accessibility principles into mainstream education for designers, engineers and researchers.

## Use AI and other advanced technologies to help achieve more responsive, inclusive and innovative VET systems

AI and other advanced technologies can help VET systems react faster to changing skills needs, remove barriers to participation for diverse learners, and expand the repertoire of teaching, learning and assessment methods. Recent OECD work points to the value of data-rich guidance and modular learning offers, while country experiences show how digital platforms and skills-intelligence infrastructures can make programmes more dynamic and better connected to labour market demand. Insights from

practitioners and employers further underline that, if thoughtfully deployed, AI can personalise pathways for neurodivergent learners and support smoother transitions into work. Governments can achieve more responsive, inclusive and innovative VET systems by:

**Making VET more responsive with data and AI.** VET systems can use AI, machine learning and big-data methods to detect changing skill needs faster, target updates to qualifications and steer provision to where demand is rising (OECD, 2025[54]; OECD, 2025[52]). Vocational rehabilitation expert Veronika Kaska stressed that training content must be updated regularly to reflect evolving tasks and tools. The OECD report on future-ready VET (OECD, 2023[31]) argues that countries can enrich existing qualifications update processes with AI-supported analytics that identify not only new jobs but the specific competencies and regions where they are emerging, complementing but not replacing social-partner processes. Estonia's reform of their qualification system illustrates this direction, by integrating forecasting with the qualifications system and developing digital solutions for skills registers and assessments. To turn this intelligence into action for learners, guidance services should use AI-enhanced labour-market information together with skills profiling and e-portfolios, so learners can see which skills are in demand, map their current evidence to learning outcomes, and plan next steps as jobs and tools evolve (OECD, 2023[31]). Estonia's national education information system, which links student records and outcomes and publishes aggregated data, shows how schools and learners can use evidence to navigate pathways.

**Keeping VET relevant amid rapid technological change through employer engagement and work-based learning**. VET stays relevant when learning takes place in authentic environments and when employers help to shape what is taught and how it is delivered. OECD work recommends engaging social partners to steer technology use, co-design sector toolkits and shared standards, and align AI-enabled content, assessments and equipment with workplace practice (OECD, 2023[31]). Rajesh Ananda warned that, as entry-level roles shrink, particularly in the tech sector, the real constraint is access to on-the-job experience rather than the availability of tools. In the same vein, Esteban Tromel at the ILO argued for expanding and redesigning apprenticeships and other work-based learning so employers co-design curricula and assessments with providers, help select and trial tools, and co-deliver training and mentoring in real settings. This joint delivery makes it easier to adapt processes and technologies to individual needs, including those of neurodivergent learners, and ensures that what learners practise matches how work is actually done.

**Using AI and advanced technology to broaden accessibility and inclusion in VET.** In flexible VET systems, with modular pathways, micro-credentials, recognition of prior learning, and part-time or online study, AI and assistive tools can help more learners find and follow paths that are more efficient, better aligned with their competencies and prior experience, and closer to their goals and motivation. For instance, automated diagnostics based on e-portfolios can help place learners into the right modules and recommend pathways. Day to day, built-in accessibility features powered by AI, such as real-time captioning, speech-to-text, text-to-speech, reading-level controls, plain-language rewrites and instant translation, make materials easier to access for multilingual learners and for neurodivergent learners who benefit from simpler language and clearer instructions. Executive-function supports, including AI planners that break tasks into steps, visual schedules and smart reminders, help learners with ADHD manage practical work; conversational assistants can simplify rubrics and generate exemplars on demand without replacing human tutoring. Inclusion also depends on people and infrastructure: Ann Kennedy, a further education tutor, emphasised that inclusive use of AI should sit alongside targeted support, the development of staff expertise, smaller staff-to-learner ratios where needed and structured peer learning. Rohan Slaughter pointed to regionally funded assistive-technology expertise to ensure consistent support in general education settings, and not only in SEN institutions.

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# Annex A. List of interviewees

The following interviewees agreed to be named.

| | |
|---|---|
| Aida Nazari | Co-Founder and Chief Operating Officer, LuxAI |
| Alisdair Gurling | Researcher, Wonderlab, Monash University |
| Ann Kennedy | Tutor in further education |
| Athena-Anna Christopoulou | Head, Protection of the Rights of Students with Disability and/or Special Educational Needs, Directorate of Special Education, Greek Ministry of Education, Religious Affairs and Sports |
| Brad Tombling | Chief Operating Officer, Bud Systems |
| Carlos Pereira | Founder and CEO, Livox |
| Christopher Patnoe | Head of EMEA Accessibility and Disability Innovation, Google |
| Clayton Lewis | Professor Emeritus of Computer Science, University of Colorado |
| Colm McNamee | Employability Mentor, Cuimsiú, FIT (Fastrack into Information Technology) |
| Cristina-Anamaria Cotescu | Associate Professor, Special Education Department, Babes-Bolyai University |
| Dave Tucker | Founder and CEO, Genio |
| David Banes | Director, David Banes Access and Inclusion Services |
| David Voss | Works on digital learning in higher education |
| Deborah Millar | Executive Director of Digital Transformation, Hull College |
| Egide Niyongira | Digital Skills and Inclusion Advisor at Digital Transformation Center, GIZ Rwanda |
| Eleni Damianidou | Headteacher of a gymnasium; Scientific Associate, European University Cyprus |
| Elisabetta Bertola | AAC Specialist Co-ordinator, Irisbond |
| Esteban Tromel | Senior Disability Specialist, International Labour Organization |
| Francesc Sistach | CEO, Specialisterne Global |
| Freya Bevan | Digital Learning Coach with AI Focus, Gloucestershire College |
| Geena Vaubulas | UX researcher; Member Board of Trustees, The Oaks Specialist College |
| Heather Tartaglia | Global and Americas Neuro-Diverse Center of Excellence Go-To-Market Leader, EY |
| Helen Nicholson-Benn | Assistive Technology/AI specialist, Jisc |
| Hélène Chinal | Head of Transformation, Capgemini Southern and Central Europe |
| Hiren Shukla | Global and Americas Neuro-Diverse Center of Excellence Leader, EY |
| Jan Schlueter | Entrepreneur in Residence, Frist Center for Autism and Innovation at Vanderbilt University; Co-Founder and CEO, Neurodiverse Technologies Inc |
| Janus Askø Madsen | Co-Founder and CEO, EyeJustRead |
| Jürgen Menze | Coordinator of ILO global business and Disability Network, International Labour Organization |
| Karine Vasselin | Vice President, Global Head of Inclusive Futures, Capgemini |
| Kellie Mote | Programme Lead (Accessibility), Jisc |
| Kevin Gonyop Kim | Professor of Spatial Computing and 3D Technologies, Institute of Interactive Technologies at University of Applied Sciences and Arts Northwestern Switzerland (FHNW) |
| Kevin Polley | Staff member, Knowledge Centre Digisprong, under the Flemish Department for Education and Training |
| Loannis Bousdounis | Head, Directorate of Special Education, Greek Ministry of Education, Religious Affairs and Sports |

| | |
|---|---|
| Lorenzo Desideri | Professor in Psychology and Artificial Intelligence, Sigmund Freud University Milano |
| Marius Frank | Education Director, Microlink PC |
| Michael Fembek | CEO, Zero Project, Essl Foundation |
| Motti Sigel | Managing Director, MassChallenge Israel |
| Nathaniel Cook | Chief of Information and Technology, Special Olympics |
| Nasser Siabi | CEO, Microlink PC |
| Neil Milliken | Vice President, Global Head of Accessibility & Digital Inclusion, Atos |
| Nicole Lonican | Programme Co-ordinator, Cuimsiú, FIT (Fastrack into Information Technology) |
| Nwanneka Udeka | Speech-Language Pathologist, Unique Strides Therapy |
| Pavan Konanur | CEO and Co-Founder, Hoja AI |
| Pedro Encarnação | President of AAATE (Association for the Advancement of Assistive Technology in Europe); Senior Affiliate Professor at Universidade Católica Portuguesa |
| Piia Jokelainen | Educational Digital Specialist, Luovi Vocational College |
| Pierre Dillenbourg | Full Professor, Computer-Human Interaction Lab for Learning & Instruction, Swiss Federal Institute of Technology (EPFL) |
| Rajesh Ananda | CEO, Ultranauts |
| Redwane Bennani | CEO, Talents Handicap |
| Ricardo Rosas | Professor, School of Psychology, Universidad de Chile |
| Rob van de Ven | Co-Founder, HappyBots |
| Robert McLaren | Director of Policy, Policy Connect |
| Rohan Slaughter | Senior Lecturer, University of Dundee; Programme lead for the MSc in Educational Assistive Technology |
| Sandra Fomotškin | Advisor on Inclusive Education, Ministry of Education and Research of Estonia |
| Susan Scott-Parker | Founder, Business Disability International. She contributed to the study in the hope that VET systems can better enable the life chances of all young people with all disabilities. |
| Thomas Köhler | Chair of Educational Technology, TU Dresden Institute for Vocational Education and Vocational Didactics; Director, TU Dresden for Open Digital Innovation and Participation (CODIP) |
| Thorkil Sonne | Founder, Square Foundation |
| Ursula Schemm | Corporate Communications, Auticon Deutschland |
| Veronika Kaska | Deputy Director, Astangu Vocational Rehabilitation Centre |
| Yonah Welker | Public Technologist and Visiting Lecturer |
| Yuwei Lin | Senior Lecturer, School of Arts, Humanities and Social Sciences, University of Roehampton |

# Annex B. Topic guide

Interviewers used the following topic guide to conduct interviews. Interviews were adapted according to the interviewees' profiles and expertise, as indicated in the interviewee instructions *[IN BLUE]*. Suggested follow-up questions are marked with a blue bullet point.

## Introduction

The objective of this project is to gather good practices and recommendations on how AI and other advanced technologies could support learners with ADHD (Attention-Deficit/Hyperactivity Disorder), ASD (Autism Spectrum Disorder) and learning disabilities in vocational education and training. By participating in this interview, you will help us identify what tools offer the most promise in this regard, identify the main challenges and opportunities, and develop these good practices and recommendations.

Establish key concepts (only if necessary):

- **Artificial intelligence** (or AI) is what enables smart computer programmes and machines to carry out tasks that would typically require human intelligence.
- In training, people talk about AI being used to generate content, to personalise learning based on analysis of large amounts of data, and to match people to training or employment opportunities – these are just examples, there is no need to narrow your thinking just to these.
- **Advanced technologies** includes robotics, virtual reality, augmented reality and any tools that could be easily enhanced with AI's capabilities in the near future.
- **Vocational education and training** (or VET) refers to education that prepares learners for occupations rooted in manual or practical activities. You can think of classroom-based learning, work-based learning and apprenticeships, and training relevant for the school-to-work transition.
- In this project, we focus on primarily on learners with ADHD (Attention-Deficit/Hyperactivity Disorder) and ASD (Autism Spectrum Disorder); and learners with learning disabilities, such as dyslexia, dyscalculia and dysgraphia.

Confirm that they:

- have received the **data protection notice** and have taken note of its contents
- **consent to be cited in the report** and if so, how they prefer to be cited: whether they prefer to be cited using their name, occupation/job title and organisation so that they can be easily identified, or instead only using their occupation/job title and sector/organisation type so that they cannot be easily identified
- consent to participate and consent for the recording to start.

Q01. Could you describe your current position and how it connects to the use of AI and other advanced technologies in supporting learners with ADHD, ASD and learning disabilities in VET? *[ASK ALL]*

## A. *Actual use* of AI and advanced technologies to support learners with ADHD, ASD and learning disabilities in VET *[ASK ONLY IF INTERVIEWEE IS FAMILIAR WITH TOOLS IN THIS SPACE]*

Q02. To the best of your knowledge, what are the main AI and advanced technology tools being used to support learners with ADHD, ASD and learning disabilities in VET?

- What does the tool do?
- Who uses the tool: learners; teachers and trainers; or institutions?
- Focused on particular disability/neurodivergence? Which one(s)?
- In which setting is the tool used: in the classroom, in workshops, in work-based learning?
- What aspect of VET is impacted by the tool?
- Was the tool designed specifically for training/education or for more general use? How suited is it to vocational skills?

Q03. How does the tool support learners with ADHD, ASD and learning disabilities in VET?

- Does the tool aim to provide support tailored to specific disabilities or does it aim to provide a universally accessible solution that accommodates all users regardless of disability status?
- Does the tool have accessibility as its first intent or is accessibility as by-product?
- Could it help overcome negative attitudes or biases regarding disability? Could it worsen them?
- Who made the decision to use the tool? Is further innovation/diffusion anticipated? What kind? Will its impact on accessibility change?
- Has the tool been validated? If so, how?

Q04. Does the tool use AI? If so, how?

- If so, could it exist in its present form without it? How does it improve on previously existing solutions?
- What “AI technique” (ML, DL, etc.), what AI “field of application” (NLP, computer vision, etc.) and what implications for accessibility?
- If not, what other advanced technology is it based on? Could the tool be enhanced with AI in future?

Q05. Are existing tools being used to their full potential?

- If so, what are the key factors for success?
- If not, why not? Will the full potential ever be realised?
- Do existing tools respond to actual needs? How do schools/institutions/employers ensure this? Is there any kind of consultation? Any kind of evaluation?
- Do teachers and trainers have the skills to make appropriate use of existing technologies/tools?
- How do decision makers/individuals choose which tools to use?
- How well do they fit into an individual’s journey through VET and into employment?
- How well do they align with existing laws, rights, support systems and policies?
- Are there sufficient tools for VET learners/skills (compared to general/academic)?

## B. The *potential* of AI and other advanced technologies to support learners with ADHD, ASD and learning disabilities in VET *[ASK ALL]*

Q06. Can you describe what you see as the potential for AI and other advanced technologies to support learners with ADHD, ASD and learning disabilities in VET?

- What is missing? What would be useful to do with the technology? What isn't there?

## C. Main challenges in VET [ASK NEURODIVERGENCE/DISABILITY EXPERTS]

Q07. What would you say are the main challenges for learners with ADHD, ASD and learning disabilities in VET?

- For the learners themselves, for learners with different disabilities, for teachers/trainers, for employers, for policymakers, for VET providers/institutions?
- In entry to VET, in the transition to work?
- In the classroom, in workshops, in work-based learning?

Q08. Where does accessibility rank in terms of priorities for VET providers? Can you tell me about the other priorities?

Q09. Is the use of technology in VET generally encouraged? How?

- What are the barriers?

## D. The assistive tech ecosystem *[ASK ASSISTIVE/EDTECH EXPERTS]*

Q10. How would you describe the assistive tech eco-system for education and training?

- Typology of actors? For-profit firms, independent app developers, multinational's research department, start-ups?
- Traditional or subsidised market?
- How does the (increasing?) prevalence of open-source AI solutions affect these dynamics?

Q11. How would you describe the typical business model for private sector firms in this field?

- Who are the clients? Schools and institutions, individuals, employers, government?
- Measure of commercial success / financial viability/ return on investment?

## E. Risks when using AI and advanced technologies in VET *[ASK ALL]*

Q12. What are the ethical issues, if any, that emerge when using AI and advanced technologies to support learners with ADHD, ASD and learning disabilities in VET? *[*e.g. *bias, transparency, explainability, privacy]*

- For individual learners, VET providers, policymakers, teachers/instructors, employers, Public Employment Services?
- How should these issues be addressed? By who?

Q13. Are there any other risks you would like to tell me about?

- How should they be addressed/minimised?

## F. Government policy and regulation *[ASK ALL]*

Q14. How does the government support the use of AI and advanced technologies to support learners with ADHD, ASD and learning disabilities in VET?

- Does the government put any barriers in the way? Which ones?
- Where does accessibility rank in terms of priorities for VET policy? Can you tell me about the other priorities? Is accessibility improving within VET?

Q15. Is there any government policy or regulation you would like to see in this regard?

## G. Closing questions

Q16. If you had to summarise, what would you say are, in your opinion, the main challenges and opportunities when it comes to using AI and advanced technologies to support learners with ADHD, ASD and learning disabilities in VET?

Q17. What do you see as the next big technical frontier in using AI to improve accessibility?

Q18. More generally, what is your assessment of the future of this field, and the opportunities and challenges lying ahead?

Q19. Are there any other experts you would recommend I talk to?

Q20. Any big issues / questions missing in this questionnaire?

Q21. Is there anything else you would like to share?

# Annex C. Glossary

**Ableist/Ableism**: Relating to policies, institutions, customs, behaviours, etc. that reflect the prejudiced assumption that people without disability represent a "norm", thereby leading to discrimination against people with disability, participating in their unfair or harmful treatment (Touzet, 2023[46]).

**Accessibility:** Refers to situations in which "people are not excluded from using something on the basis of experiencing a disability" (Duggin, 2016[55]).

**Executive function:** The mental processes that contribute to self-regulation are often referred to as executive functions, which include cognitive flexibility, or the ability to change perspectives or adapt flexibly to change, working memory, or the ability to retain and manipulate information, and inhibitory control, or the ability to inhibit impulsive responses (Diamond, 2013[56]).

**Generative AI (GenAI):** A category of AI that can create new content such as text, images, videos, and music (OECD, n.d.[57]). It gained global attention in 2022 with text-to-image generators and Large Language Models (LLMs).

**Inclusive education** is "an on-going process aimed at offering quality education for all while respecting diversity and the different needs and abilities, characteristics and learning expectations of the students and communities, eliminating all forms of discrimination" (UNESCO International Bureau of Education, 2009[58]). The goal of inclusive education is to respond to all students' needs, going beyond school attendance and achievement, while improving all students' well-being and participation (Cerna et al., 2021[59]).

**Mainstream education** settings bring "learners with special education needs into general educational settings or regular schools", while addressing the needs of all students and ensuring full participation (UNESCO, 2019[60]).

**Special Education Needs (SEN)** is a term used in many education systems to characterise the broad array of needs of students and learners who are affected by learning disabilities (i.e. dyslexia, dysgraphia), physical impairments (i.e. hearing and visual impairments), and mental disorders (i.e. autism spectrum disorder (ASD), Attention Deficit/Hyperactivity Disorder (ADHD) (Cerna et al., 2021[59]).

# Notes

[1] An OECD report on building future-ready VET (2023[31]) describes the potential for AI to improve selection practices within VET, using data-oriented methods to identify individuals and employers that could benefit from VET participation.

[2] In some EU countries, there are at least some types of VET programme which are perceived, and sometimes intentionally designed, as being for learners with learning difficulties or other special education needs (Cedefop, 2016[35]). So-called special vocational schools and apprenticeship programmes can indicate that insufficient progress has been made towards inclusive schooling in general and vocational education (Waddington, 2018[32]). They exist despite research showing that students with disability perform better in mainstream settings than in segregated settings, through peer learning and better social skills (OECD, 2022[9]). Special vocational schools often do not offer official qualifications and thus do not help learners to meet entry requirements of other vocational training or apprenticeships and reduce the likelihood of entering employment compared to those in mainstream vocational education (Waddington, 2018[32]).

[3] In line with the UN Convention on the Rights of Persons with Disabilities (2006[61]) calling on signatories to provide inclusive schooling in both general tertiary education and in VET.

[4] While there can be some overlap between the two, the distinction between “disability-centred” solutions and “environment-adaptation” solutions was an important component of previous OECD research (Touzet, 2023[46]) on the use of AI to support people with disability in the labour market.

[5] In the United Kingdom vocational training system, rigid frameworks such as predefined training plans and compliance requirements pose a significant barrier to implementing personalised or adaptive learning pathways at scale, according to Brad Tombling, Chief Operating Officer of Bud Systems.

[6] Ego4D is one such dataset, comprising 3 670 hours of video of 923 participants performing everyday activities in real-world setting, allowing AI to understand functional relationships between tools and gestures.

[7] Francesc Sistach cited a Danish study that showed that every Danish kroner invested in the labour inclusion of people with autism ends up generating 2.4 kroner in taxes. In the United Kingdom, Neil Milliken estimated that the Access to Work grant had a 20% return on investment.

[8] Similar risks were highlighted in a recent OECD report on the potential impact of AI on equity and inclusion (Varsik and Vosberg, 2024[43]), which noted that during COVID-19, Human Rights Watch found that many

education technology products used data practices that compromised children's rights, collecting detailed personal information, including location, activities, family information and socio-economic status.

[9] A broader point, made by Alisdair Gurling, is that because these tools generate content based on pre-existing information and often without clear attribution, they could endanger the entire process of knowledge production.

[10] Pierre Dillenbourg likened this to how reliance on GPS has diminished students' navigation skills and how calculators have diminished their ability for mental calculations.

[11] For instance, OpenAI has acknowledged ChatGPT's shortcomings in interacting with people in serious mental and emotional distress and has said it is working to strengthen safeguards (including referring people to professional help) and to block harmful content more effectively (OpenAI, 2025[62]).

# AI to Support Neurodivergent Learners in Vocational Education and Training

AI (Artificial Intelligence) and other advanced technologies could support neurodivergent learners in VET (Vocational Education and Training) settings, including in work-based learning and apprenticeships, and the transition to work. This report explores the use of these technologies by learners with Autism Spectrum Disorder (ASD), Attention-Deficit/Hyperactivity Disorder (ADHD), dyslexia, dyscalculia and dysgraphia, and by teachers and trainers catering for diverse needs. Drawing on insights from over 50 stakeholder interviews, the report highlights the potential of these technologies to make VET more adaptive, accessible and inclusive. For instance, Extended Reality (XR) technologies can enable immersive, adaptable and practice-oriented learning, while accessibility tools (e.g. speech-to-text) have become more accurate in recent years due to advances in AI and in cloud computing. The use of AI and other advanced technologies raises risks related to data privacy, bias, socio-emotional well-being and skill development, many of which also apply to the wider learner population. The report's policy guidelines highlight the important role that governments can play in equipping VET teachers and trainers with the right skills, supporting the assistive technology ecosystem, and helping neurodivergent learners, VET institutions and employers to navigate new technological advances.

Co-funded by the European Union

PRINT ISBN 978-92-64-69301-2
PDF ISBN 978-92-64-51331-0

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