FUTURE-READY VOCATIONAL EDUCATION

HARNESSING TECHNOLOGY FOR SUCCESS

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aelp

ufi VocTech Trust

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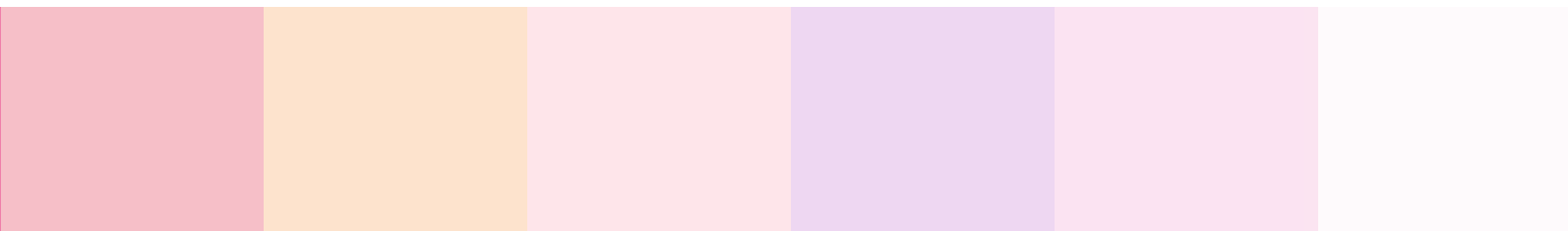
JOINT FOREWORD

AELP AND UFI VOCTECH TRUST

The UK is facing a skills crisis, not enough adults have the skills they need to access or succeed in good work, in turn this is holding back the UK's economic potential. Vocational education and training providers play a vital role in equipping the workforce with the skills they need for work. To ensure that everyone can get the skills they need, and ensure no one is left behind, we must take advantage of all that digital technology has to offer.

Just over three years ago, the Covid-19 pandemic resulted in the physical closure of educational institutions and an almost overnight adoption of remote learning. Since then, there have been significant shifts in the modes and types of delivery with a near complete shift to a fully 'tech-blended' approach.

Without technology, educational institutions would not have been able to continue delivering skills training so effectively throughout the pandemic. Indeed, those technological shifts have meant education is more accessible to learners who would otherwise not have been able to attend face-to-face classes.

We should be proud of the way the skills sector navigated those tough times. However, it is important to look forward and ask what is the future for technology in education training? That question was the prompt that led AELP and Ufi VocTech Trust to launch our strategic partnership earlier this year. Our partnership together means we can develop greater insight into the skills sector and think more carefully about how technology can be used to enhance high-quality delivery.

Vocational education and training providers are central to equipping adults with the skills the UK needs and ensuring that everyone is able to thrive. Our partnership seeks to drive up understanding, access and enthusiasm for the role of digital technology in unlocking the UK's skills.

Future-Ready Vocational Learning: Harnessing Technology for Success is the first major output of that partnership and looks closely at the impact vocational education technology has on training provision, as well as the associated benefits, challenges, and best practices.

Remote learning remains prevalent after the pandemic. Providers are using learning technology more frequently and perceive this to have had a positive impact on training, primarily through widening accessibility and expanding training opportunities. There is also a willingness to adopt new technology to enhance the learning experience – yet barriers to technology use by trainers remain - including a lack of access to Wi-Fi, devices, and a shortage of digital skills including digital pedagogy. We also know that keeping learners engaged is critical for remote learning success.

The report acknowledges the advantages of technology within an education setting whilst considering what more we can do to improve the use of digital tools. The report makes a series of recommendations for Government, the sector and training providers, all aimed at creating the blueprint for a successful further education sector.

We want Government to think more about the funding for educational technology and guidance it offers to training providers, and we want providers to consider joining networks to share knowledge and build connections. Most importantly, we want to hear more from everyone about what we can all be doing to support wider adoption of digital technology.

PAUL WARNER

DIRECTOR OF STRATEGY AND
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AELP

LOUISE ROWLAND

DEPUTY CHIEF EXECUTIVE

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EXECUTIVE SUMMARY

Technology is transforming further education, new modes of delivery and innovative technology are changing the ways adults learn for work. Independent training providers (ITPs) play a key role in the delivery of adult skills, a role that is more important now as the UK faces serious skills shortages. Ufi and AELP set out to understand what barriers, challenges and opportunities face ITPs, particularly in the wake of Covid-19. We also wanted to understand what steps we, the sector and Government should be taking to better prepare the industry for the adoption and deployment of new technologies.

The further education sector persists, after the Covid-19 pandemic, in utilising technology for training and remote learning, benefiting providers, learners, employers, and End Point Assessment Organisations (EPAO)s. Despite the advantages, challenges persist in delivering high-quality training through technology. This report provides an extensive analysis of the impact of educational technology on training provision. It examines the benefits, challenges, and suggested strategies by utilising the Department for Education (DfE) (2019) EdTech Framework for Change as the main research framework, with a specific focus on ITPs.

Data was collected through surveys, interviews, and roundtable discussions, involving 71 respondents, 11 interviewees, and 5 roundtable discussions primarily with ITPs.

KEY FINDINGS

USE OF TECHNOLOGY AND ITS PERCEIVED BENEFITS

→ After the pandemic, remote learning continues to be widely used. About 70% of training providers use a blended approach of remote and in-person methods, while 13% rely solely on remote learning. Approximately 76% of providers now frequently or always use learning technology, a significant increase from the pre-Covid period when only 30% utilised technology frequently.

→ ITPs commonly utilise virtual classrooms (81%), videos (79%), and learning management systems (52%) to enhance teaching practises, administration, and assessment.

→ Providers see technology as positively impacting training, improving accessibility (92%) and expanding opportunities (94%), especially for those in remote areas and with disabilities. Remote learning is cost-effective, saving time and money for learners and tutors (72%), although it is crucial to recognise the need for a substantial initial and continuous investment.

→ 85% of ITPs are open to adopting new technologies, and 72% of them intend to further increase their usage within the next three years.

CHALLENGES AND GOOD PRACTICE

→ Main barriers reported by ITPs include connectivity issues, such as lack of Wi-Fi (55%) and devices (66%). Lack of digital skills, including digital pedagogy (64%), can greatly impact learning with frequent disruptions.

→ The report emphasises challenges with learner engagement in online sessions. Lack of physical interaction and external distractions can hinder focus, making it difficult for providers to sustain learners' interest.

→ In order to address the challenges identified and enhance learners' engagement, providers employ a range of effective strategies. These strategies include implementing quizzes, conducting interactive Q&A sessions, facilitating group work activities, and incorporating educational games – these are to test the understanding of knowledge and also to ensure learners develop personal and social skills that they would otherwise develop in a face to face environment.

→ ITPs shared good practises for engaging classrooms, reviewing remote learning approaches like creating a conducive environment, breaking teaching sessions into smaller modules, and more frequently monitoring and testing learners' progress and development. Frequent communication, assessment, guidance, and coach support are crucial for identifying issues and ensuring successful remote learning. This additionality though does come at a financial and time cost for ITPs.

FUTURE TECHNOLOGY THAT ITPs DESIRE

→ Providers seek future technologies in four categories: 1) Learning management system and tools s 2) Interactive and engaging learning 3) Attendance recording and tracking 4) Integration and accessibility.

→ Demand for learning management systems and tools is increasing, providing a virtual platform for learning and enabling access to materials and interactions. Interactive and engaging learning tools are desired to overcome challenges in remote learning, with AI-powered apps for specialised occupations gaining popularity. Streamlined attendance recording and tracking tools are needed to reduce workload, administrative burden and improve accuracy. The desire for accessible and integrated technologies drives the need for simplified processes and inclusive platforms, including exam-specific software such as remote invigilation and the need to make capital investment in appropriate hardware.

PROVIDERS PERSPECTIVES ON THE FUTURE IMPACT OF AI IN FURTHER EDUCATION

→ Providers generally hold a positive perspective on AI rather than a negative one. Although the education sector is still very much in the foothills of the utilisation of new and developing AI learning technology, ITPs see AI as an opportunity for effective teaching and learning, acting as virtual mentors, offering supplementary information, and identifying knowledge gaps in further education.

→ However, ITPs stress responsible use and equipping learners with ethical skills to mitigate the potential misuse of AI and addressing the digital divide to ensure equitable access to AI tools.

IMPLICATIONS

→ **Adoption of Technology in Training:** Research shows increased tech adoption in training, especially by ITPs. Remote learning and technology enhance accessibility and opportunities for all learners. Both of which groups would be otherwise excluded from accessing traditional face to face educational provision. To ensure equal access to education, ITPs should invest in technology infrastructure and training – although there are significant cost implications and ITPs do not have access to government backed capital investment programmes which is a sizeable barrier in developing the infrastructure.

→ The development of high-quality learning materials and content also involves significant upfront investment and ongoing investment to keep the curriculum both current and valid. Remote learning has also proven cost-effective, saving time and money for both learners and tutors, but it is important to recognize the requirement for significant upfront and ongoing investments here as well. In the current economic environment the financial squeeze caused by the high periods of inflation has the potential to derail future investment in learning technologies. Openness to new tech underscores the need for instructor upskilling to effectively integrate technology into teaching.

→ **Addressing Challenges and Enhancing Engagement:** ITPs face challenges in remote learning, such as lack of Wi-Fi and devices, digital skills gaps, and learner engagement issues. To overcome these challenges, ITPs need to prioritise infrastructure investment and provide necessary resources like Wi-Fi access and devices for all learners. Offering training and support programmes to enhance the digital skills of instructors enables them to effectively utilise technology for pedagogical purposes. Strategies like interactive activities, quizzes, and educational games can foster active participation and sustain learners' interest. Regular communication, assessment, guidance, and support are crucial for monitoring progress and addressing any issues that arise during remote learning.

→ **Future Technologies for Enhanced Learning:** Identified future technology needs of ITPs provide insights into areas of development for enhanced learning experiences. Robust learning management systems and tools are in high demand for virtual platforms, access to learning materials, and interactivity. Investing in these systems and exploring emerging tools creates engaging and interactive learning environments. Streamlined attendance recording and tracking tools reduce administrative burdens and enhance accuracy. Prioritising inclusive and accessible technologies, such as exam-specific software and laptops, ensures equitable access for all learners, regardless of individual needs or disabilities.

→ **Positive Perspectives on AI and Responsible Use:** ITPs hold a positive perspective on the impact of artificial intelligence (AI) in further education. AI can serve as a virtual mentor, offering supplementary information and identifying knowledge gaps. However, responsible use of AI is crucial. ITPs should take proactive measures to ensure ethical deployment and address concerns related to the digital divide. Incorporating ethical considerations and responsible AI practises into the curriculum and professional development programmes will equip learners with the necessary skills to understand and utilise AI ethically.

In conclusion, the research underscores the increasing importance of technology for independent training providers (ITPs). To maximise the benefits of technology, ITPs must invest in infrastructure, allocate resources, and enhance digital skills. However, this necessitates shared investment, and the government should expand grant eligibility to include ITPs, offering more support. It is crucial to implement strategies that address challenges and improve engagement while exploring future technologies to enhance learning experiences. Responsible adoption of AI is essential, highlighting ethical usage and bridging the digital divide for equitable access. By considering these implications, ITPs can effectively navigate the changing education landscape and deliver quality learning opportunities in the digital era.

RECOMMENDATIONS

Based on the research findings, the report recommends the following actions:

1. INVEST IN TECHNOLOGY INFRASTRUCTURE

The UK government should place a strong emphasis on investing in technology infrastructure, particularly in remote and underserved regions, in order to ensure equitable access to education. This involves improving and expanding Wi-Fi connectivity.

In March 2021, BDUK launched Project Gigabit with the aim of bridging the digital divide by significantly improving connectivity for households and businesses. Furthermore, BDUK has set a target of achieving 95% 4G coverage across the entire UK by the end of 2025, facilitated by the £1 billion Shared Rural Network programme. It is hoped that these initiatives will lead to prompt improvements in Wi-Fi access. Investing in infrastructure is crucial to enable remote learning and bridge the digital divide, ensuring equal opportunities for all students.

2. FOSTER COLLABORATION AND KNOWLEDGE SHARING

Existing sector bodies, alongside the UK Government, should create a further education 'What Works' group, like existing programmes in the school and higher education sectors. This group would form a valuable place for knowledge sharing and create safe spaces for collaboration. Creating platforms for ITPs to exchange best practice, success stories, and lessons from technology-driven training is crucial.

AELP, in collaboration with Ufi, has created SECTORSHARE.org.uk as a collection of cost-free resources available for providers and employers to utilise in online delivery. It is strongly recommended that ITPs make use of these free courses to enhance their digital skills and pedagogy. Encouraging collaboration enables learning from triumphs and obstacles, driving effective strategies for technology integration in further education. This approach ensures continuous improvement and advancement of UK's educational practises.

3. DEVELOP CONTINUOUS PROFESSIONAL DEVELOPMENT (CPD) PROGRAMMES FOR DIGITAL SKILLS AND PEDAGOGY

Existing sector bodies should support ITPs for tech integration in teaching through workshops, certifications, and online courses.

The Apprenticeship Workforce Development (AWD) programme, funded by the DfE, initially launched in 2021 to support staff at all levels and roles delivering apprenticeships across Further and Higher Education settings.

The second phase of AWD launched in August 2022, and is being delivered by the Education and Training Foundation (ETF) in partnership with the Association of Employment and Learning Providers (AELP), Association of Colleges (AoC), Strategic Development Network (SDN) and University Vocational Awards Council (UVAC). New CPD resources are currently being developed following a process of training needs analysis (TNA), which involved a sector-wide survey, series of focus groups, sector research, and the expertise of all delivery partners. These new CPD resources, informed by the TNA process, will be delivered in Autumn 2023.

ITPs should be encouraged to actively engage with the programme in order to enhance their digital skills and pedagogy to ensure instructors are well-prepared to enhance teaching and learning outcomes through technology tools and platforms, contributing to improved education standards and quality of apprenticeship delivery.

4. PROVIDE FINANCIAL SUPPORT FOR DIGITAL ACCESSIBILITY

The UK government should allocate funding that considers the upfront and ongoing costs of IT infrastructure, taking into account the significant benefits that technology can bring to work-based learning. This support should prioritize digital accessibility, including the establishment of guidelines and standards for inclusive learning materials and platforms. By providing financial assistance, institutions can overcome barriers and ensure equal opportunities for students.

5. PROMOTE ETHICAL USE OF AI IN EDUCATION

The UK government must establish guidelines for ethical AI use in education, encompassing responsible deployment, data privacy, and transparent algorithms. Collaborating with ITPs to incorporate ethics and responsible AI into the curriculum is crucial. The Department for Education (DfE) released a policy paper on generative AI in education in March 2023.

However, the paper lacks clarity regarding human judgement, data privacy and security, and specific recommendations. Therefore, it is necessary to provide more specific examples, actionable guidelines, and comprehensive discussions on the collaboration between humans and AI, data privacy, and the integration of AI in education. It is important to note that the government is planning to publish an AI Regulation Roadmap, and it would be advisable to review it for further insights.

Implementing the recommendations allows ITPs to harness technology's benefits in training, overcoming obstacles and creating inclusive, engaging learning environments for all.

INTRODUCTION

Technology has become an integral part of the further education sector, with the Covid-19 pandemic bringing about a rapid change in its use. The pandemic resulted in the physical closure of educational institutions and the adoption of remote learning, facilitating an increase in the use of technology. This enabled educational institutions to continue delivering education during the pandemic and has also made education more accessible to learners who would otherwise not have been able to attend face-to-face classes.

Even after the easing of lockdown restrictions, the further education sector continues to use technology for training and/or conducting remote learning, which has brought enormous benefits to providers, learners, employers, and End Point Assessment Organisations (EPAOs). The results of a survey conducted among further education organisations in 2021 indicate that 75% provide training on site, while 19% use a combination of onsite and online methods, and 5% conduct fully online training. This suggests that currently, approximately one in four organisations offer remote teaching as part of their training programmes (Jisc, 2022). This marks a notable change compared to 2019, when 87% of teaching staff in FE had no experience teaching in a live online environment (Jisc, 2019).

Despite the potential benefits of technology in further education, challenges still exist in using it for training and remote teaching. These challenges can raise concerns about the effectiveness of delivering high-quality learning experiences. In order to improve the quality of training provided to learners through technology, it is important to identify its advantages and to address its challenges. Similarly, it is crucial to identify and implement good practice for the successful delivery of training using technology.

Furthermore, the development of Artificial Intelligence (AI) is rapidly changing society, and the further education sector is no exception. AI can be used to enhance the learning experience, providing personalised learning and feedback. However, there is a lack of understanding about the impact of AI on the further education sector. It is essential to explore the thoughts and perceptions of providers and learners on how AI can affect their delivery in the future.

This report aims to investigate the use of technology in further education, particularly remote learning, and the challenges it presents to providers and learners. The report will also provide tips and share good practice for using technology in remote learning. Additionally, the report will explore the thoughts and perceptions of providers and learners on the impact of AI on the further education sector in the future.

METHODOLOGY

This chapter focuses on the research questions and methodology used in this study. The pandemic has forced organisations and training providers to adapt to new ways of working, including the use of digital technologies to support learning and development. The aim of this study is to investigate how the use of technology in work-based learning has changed over time, identify the lessons learned from the experience of lockdown, and explore the challenges and opportunities associated with using technology in this context.

RESEARCH QUESTIONS

To achieve the aim of this study, the following research questions will be addressed:

→ How does the use of online and other technology in work-based learning differ between pre-post pandemic? Where are they used?

→ In terms of the use of technology, what lessons did providers learn from the experience of lockdown?

→ What quality, content, and delivery challenges are there in using technology?

→ What capacity-building resource would help to support and improve the use of technology?

By addressing these research questions, this study aims to provide insights into the effectiveness of technology in work-based learning and the strategies that can be used to enhance the quality of online learning experiences.

METHODS

This research study employed an explanatory sequential mixed-method design that involved surveys, interviews, and roundtable discussions. This chapter outlines the research methodology used to collect and analyse data to address the research questions.

RESEARCH DESIGN

The adopted research design is an explanatory sequential mixed-method design. This design is appropriate for gathering both quantitative and qualitative data that enables the researcher to explore a research problem in-depth. The sequential design is a two-phase design where the quantitative data are collected first, followed by the qualitative data collection. In this study, surveys were conducted first, followed by interviews and roundtable discussions.

RESEARCH FRAMEWORK

The research framework utilised the "EdTech Framework for Change" (depicted in Figure 1), which was developed by the Department for Education [DfE] in 2019. This framework comprises four key areas of opportunity[1] where technology can play a significant role in driving change, as well as four key areas for capitalising on the opportunities[2] presented by technology.

Figure 1: EdTech Framework for Change

Note. DfE. (2019). Realising the Potential of Technology in education: a Strategy for Education Providers and the Technology Industry.

Based on the research objectives, the aspect of "continuing professional development" has been excluded from the research framework. Furthermore, the original concept of "digital procurement capabilities" has been modified to "providers' future technology preferences."

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1 **4 key areas of opportunity where technology can benefit;**
Administration - reducing the burden of 'non-teaching' tasks
Assessment processes – making assessment more effective and efficient
Teaching practises – supporting access, inclusion, and improved educational outcomes for all
Continuing professional development – supporting teachers, lecturers and education leaders so they can develop more flexibly

2 **4 key areas for capitalising on the technology use;**
Infrastructure - A need for modern infrastructure to address slow internet connections and outdated internal networking and devices
Skills - The need for greater digital capability and skills
Safety - Concern about privacy, safety, and data security and how education providers and students are being protected.
Procurement - The need for digital procurement capabilities to make the right choices in selecting and buying technology products.

The survey, interviews, and roundtable discussions were designed in accordance with this framework. The aim was to gain a deeper understanding of how technology is being used in four different areas of further education: administration, assessment, teaching practises, and continuous professional development. In addition, we explored the challenges faced by providers in four key areas for capitalising on the opportunities presented by technology: infrastructure, skills, safety, and procurement.

By using this framework, we aimed to develop a comprehensive understanding of the role technology is currently playing in further education, as well as the potential it holds for driving change and improving outcomes.

SAMPLE DESIGN

The sample design for the surveys and interviews was convenience sampling. This sampling technique was appropriate for this study because the aim was to get as many responses as possible. The survey was shared online through various platforms, such as email using the Association of Employment and Learning Providers (AELP) mailing list, Twitter, and LinkedIn. A total of 71 providers responded to the survey. The completion rates were 56%. The interviewees were selected from survey respondents who agreed to participate in the interview. The 11 interviewees were from five different sectors. The Appendices contain a list of sectors.

DATA COLLECTION

The data collection process involved three methods: surveys, interviews, and roundtable discussions. The survey was conducted online between 1st February and 3rd March 2023. The survey data was analysed using Excel and Stata. The semi-structured interviews were conducted online using Microsoft Teams between 9th March and 5th April. The interviews were semi-structured, and an interview guide was developed based on the survey results. The roundtable discussions were conducted online within five focus groups based around industrial sectors, organised by AELP between 2nd and 28th March. The participants were mainly training providers, and around 12 people took part in each roundtable. Pre-planned topics were decided, but the participants were free to talk about any issues they wanted to raise regarding the use of technology in vocational and work-based learning.

DATA ANALYSIS

The quantitative data from the surveys was analysed using descriptive statistics, such as frequency and percentage distributions. The qualitative data from the interviews and roundtable discussions was analysed using thematic analysis. The data was coded and categorised into themes that emerged. The themes were then compared and contrasted to identify patterns and relationships between the themes.

The reliability and validity[3] of the research were assessed, and ethical considerations[4] were taken into account during its execution.

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[3] To ensure the validity of the study, the survey questions and interview guide were reviewed by experts in the field to ensure they were appropriate and relevant to the research questions. (DfE, 2019)

[4] The study adhered to ethical principles, such as informed consent, confidentiality, and anonymity. Participants were informed about the study's purpose and provided with the option to opt-out of the study at any time. Participants were also assured that their responses would remain confidential, and no identifiable information would be shared with any third party. (DfE, 2019)
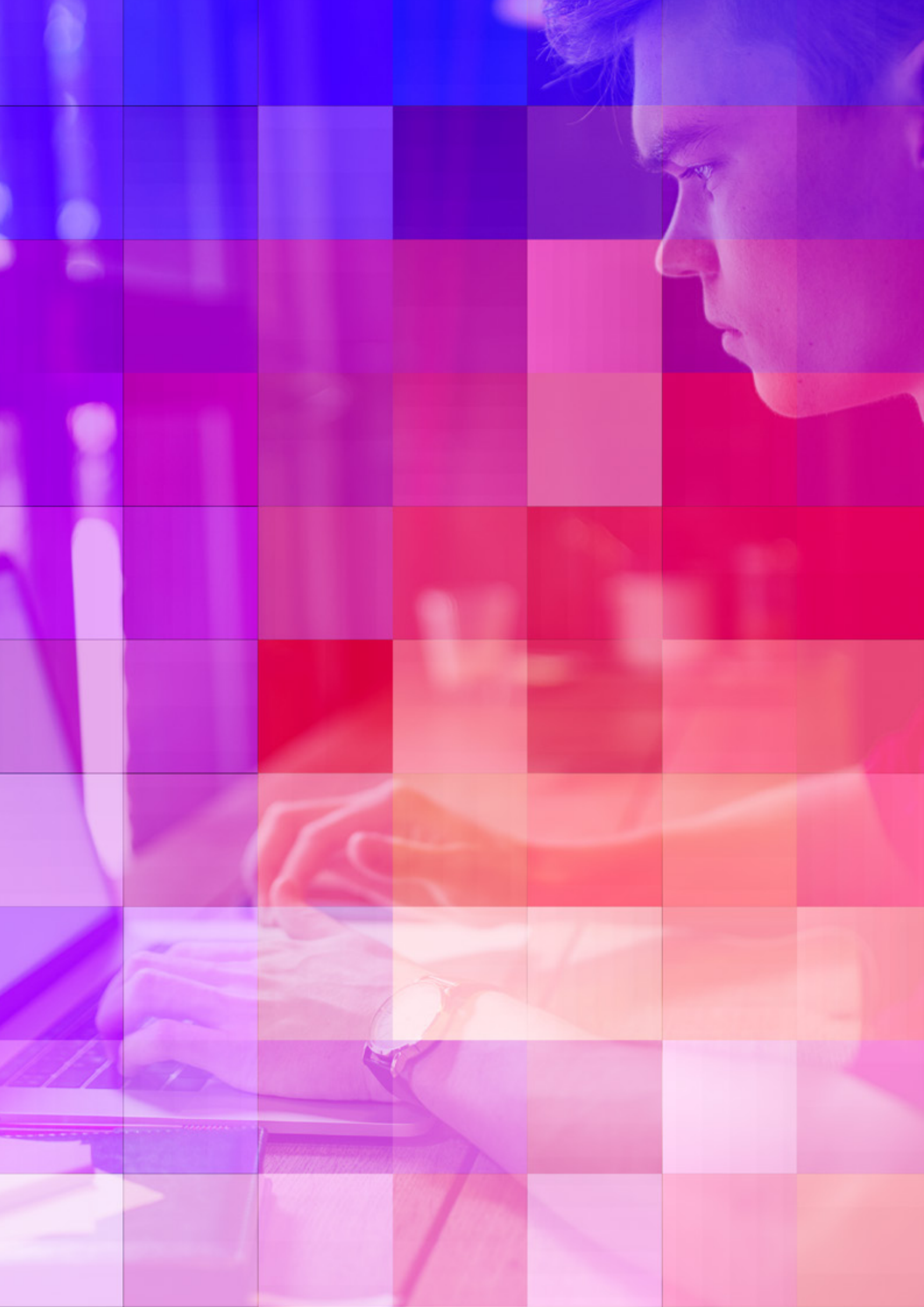
INSIGHTS INTO PROVIDERS' TECHNOLOGY USAGE: RESULTS FROM SURVEY

This chapter presents valuable insights derived from the results of the Technology Usage Survey. The survey was designed to explore the extent of technology utilisation among providers, its associated benefits, challenges encountered, and the various types of technology employed. Additionally, Appendices include detailed demographic information of the survey participants. The findings obtained from this survey offer a comprehensive understanding of the current state of technology adoption.

DESCRIPTIVE STATISTICS OF THE SURVEY RESULTS

How has training been provided in the following periods? (n=62)

| | 0% | 20% | 40% | 60% | 80% | 100% |

Pre-covid: No training 6%, Face-to-face training 66%, Partially remote 27%

During-covid: No training 8%, Face-to-face training 3%, Partially remote 19%, Fully remote 69%

Post-covid: No training 2%, Face-to-face training 16%, Partially remote 69%, Fully remote 13%

Legend: ■ No training ■ Face-to-face training ■ Partially remote ■ Fully remote

Figure 2: Training Methods over Time

Figure 2 and Figure 3 presents the survey results on the type of training provided during three periods: pre-COVID, during COVID, and post-COVID. The training types are divided into four categories: no training, face-to-face training, partially remote training, and fully remote training.

Figure 2 compares the types of training and frequency of learning technology used in different periods. Before COVID-19, face-to-face training was the most common method (66%), followed by partially remote training (27%). During COVID-19, fully remote training became the most common method (69%), and only 3% of training was face-to-face. Post-COVID-19, partially remote training became the most common method (69%), followed by face-to-face (16%) and fully remote (13%) training

Regarding the use of learning technology (Figure 3), before COVID-19, 38% of respondents said they used it " sometimes" with 28% saying they used it "rarely". Only 29% said they used it "very often" or "always". This significantly changed during the Covid-19 pandemic, with 28% of training using it "very often" and 57% "always" using it – an increase of 56 percentage points. After COVID-19, there was a slight decrease, but still 48% of respondents said they used "very often" and 28% "always" – 76% in all.
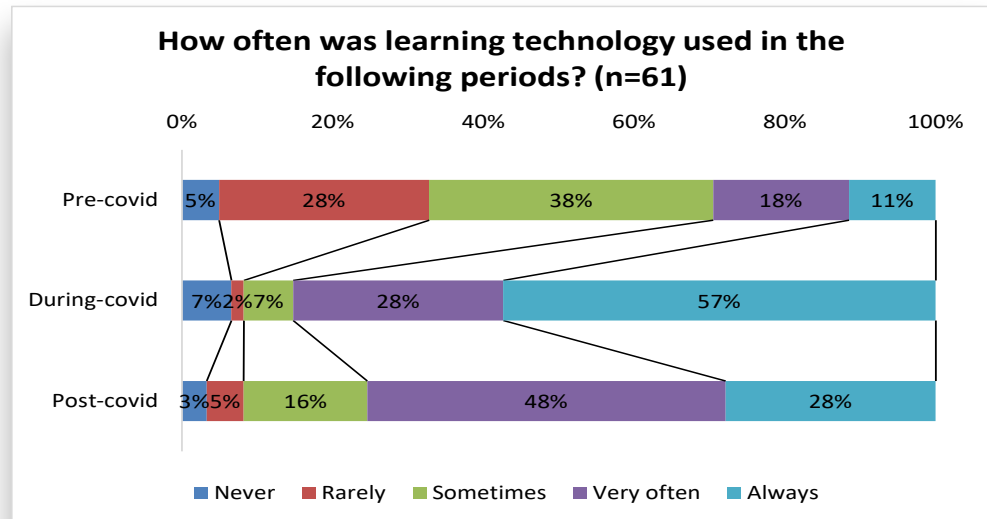
Figure 3: Frequency of Learning Technology Use

The COVID-19 pandemic caused a significant shift in the way training is provided. Even after the pandemic, partially remote training is still the most common method, and 82% of respondents conduct training partially or fully remote. The pandemic has also led to a significant increase in the use of learning technology, with a slight decrease after the pandemic.
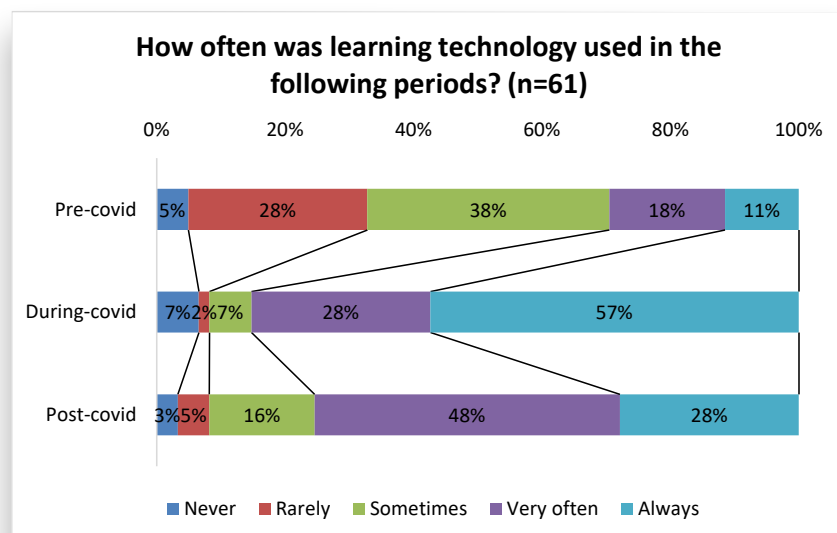
Figure 4: Organisation's Willingness to Embrace New Technology

From Figure 4, it appears that a majority of respondents (54%) strongly agree that their organisation is open to using new technology to enhance the learning experience. Another 31% agree, while only 3% strongly disagree and 2% disagree. Interestingly, 10% of respondents chose neither to agree nor disagree, which could indicate a lack of knowledge or uncertainty about their organisation's stance on using new technology for learning. Overall, it is clear that a significant proportion of respondents believe that their organisation is open to using new technology.

Figure 5 shows the majority of the respondents' organisations plan to increase their use of learning technology in the next three years. 72% of the respondents s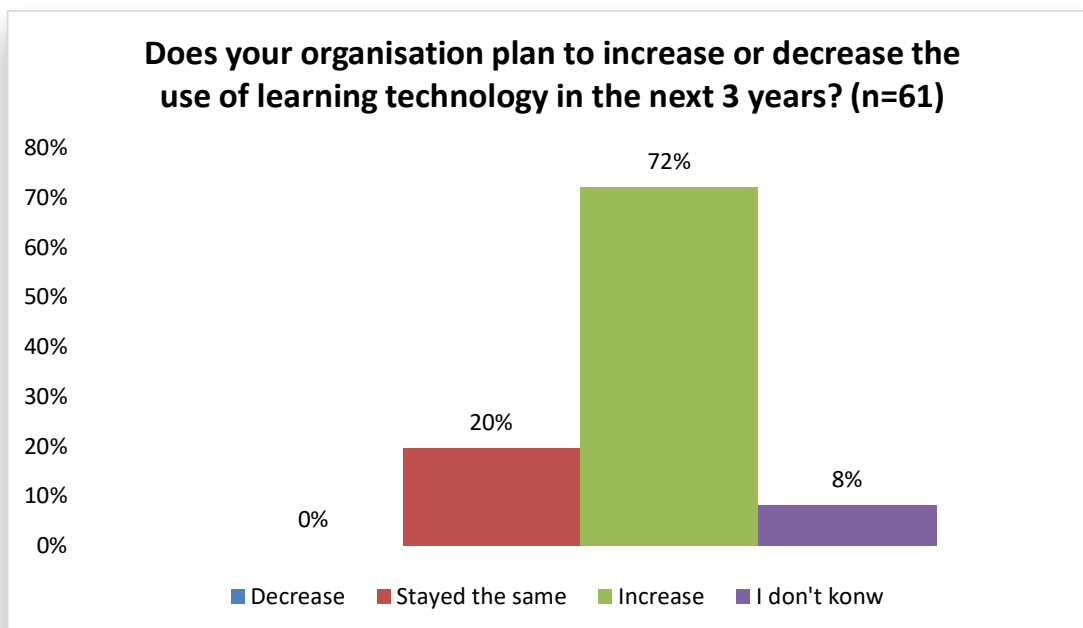tated that they plan to increase this, while 20% said it will remain the same. This data suggests that organisations are recognising the benefits of learning technology and are willing to invest in it to enhance their employees' skills and knowledge.

Figure 5: Expected Use of Learning Technology Over the Next 3 Years

Based on Figure 6, webinars/virtual classrooms and learning management systems are the most commonly used technologies, with 81% and 79% of respondents indicating their organisation uses them, respectively. Bitesize film/video and online education programmes follow, with 64% and 55% of respondents using them, respectively. The data shows that the use of more advanced technologies such as VR (Virtual Reality)/ AR (Augmented Reality) and AI is still relatively low, with only 10% and 7% of respondents indicating their use, respectively. However, it is important to note that these technologies are still in the early stages of adoption and are likely to become more prevalent in the future.
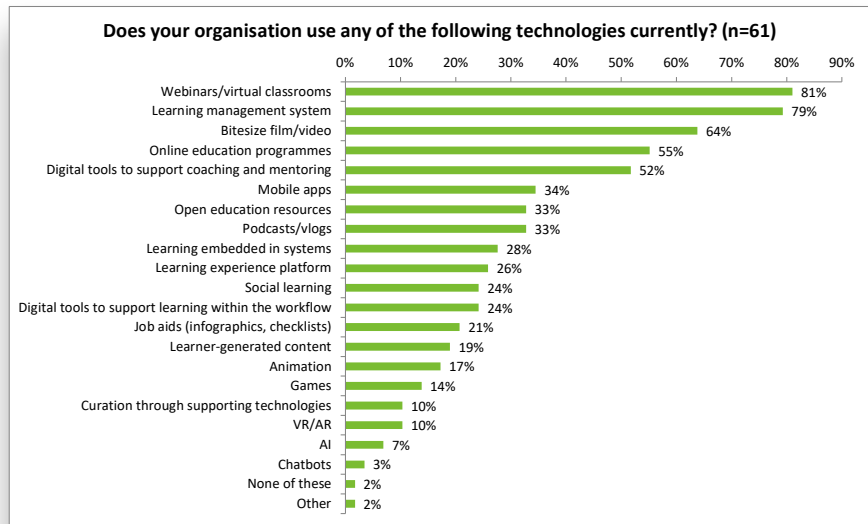
Figure 6: Current Use of Learning Technologies in the Organisation

According to Figure 7, the majority of respondents (78%) reported using technology in subject and industry-specific training, while 71% reported using it for initial/continuous/end point assessment. A significant proportion of respondents (67%) reported taking a variety of approaches to training using technology, while 66% used it for planning their training. These findings highlight the broad range of applications for technology in teaching and training, from subject-specific content delivery to learner support and accessibility.
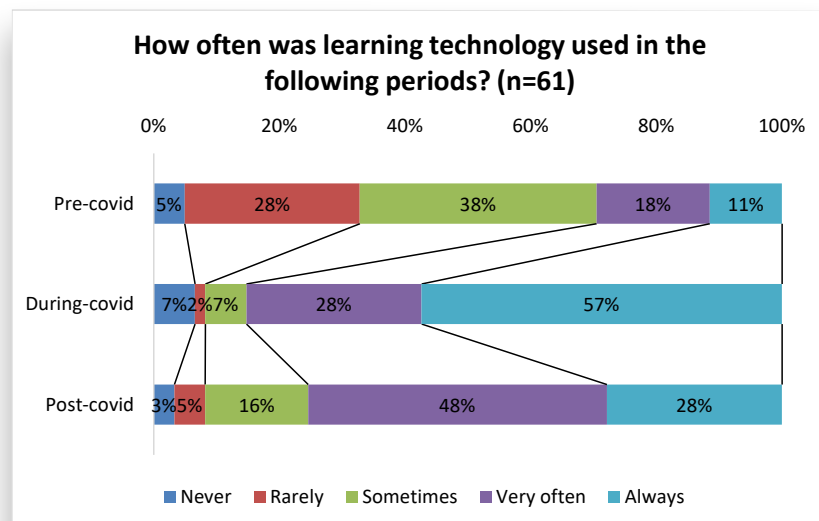
Figure 7:Areas of Teaching/Training where Technology is Currently Used

Figure 8 presents the respondents' perceptions on the extent to which they agree with the benefits of technology in education. The five benefits include widening accessibility, expanding training opportunities, supporting independent learning, cost-saving, and fostering personalisation of learning. The majority of respondents strongly agreed with the benefits of technology in widening accessibility, with 62% indicating strong agreement and 30% agreement. Similarly, a high percentage of respondents agreed that technology expands training opportunities (52% strongly agreed, 42% agreed), supports independent learning (48% strongly agreed, 42% agreed), and fosters personalisation of learning (51% strongly agreed, 20% agreed). However, opinions were more divided on the cost-saving benefit, with 42% agreeing and 30% disagreeing.

The data indicates that the respondents recognise the various benefits of technology in education, especially in terms of widening accessibility, expanding training opportunities, supporting independent learning, and fostering personalisation of learning. These findings suggest that technology has the potential to transform the way individuals learn and access education. However some respondents remain sceptical about the cost-saving benefits of technology. This could be due to the perception that the upfront costs of technology can be expensive, or that the long-term benefits are not yet perceived to justify the short-term investment.
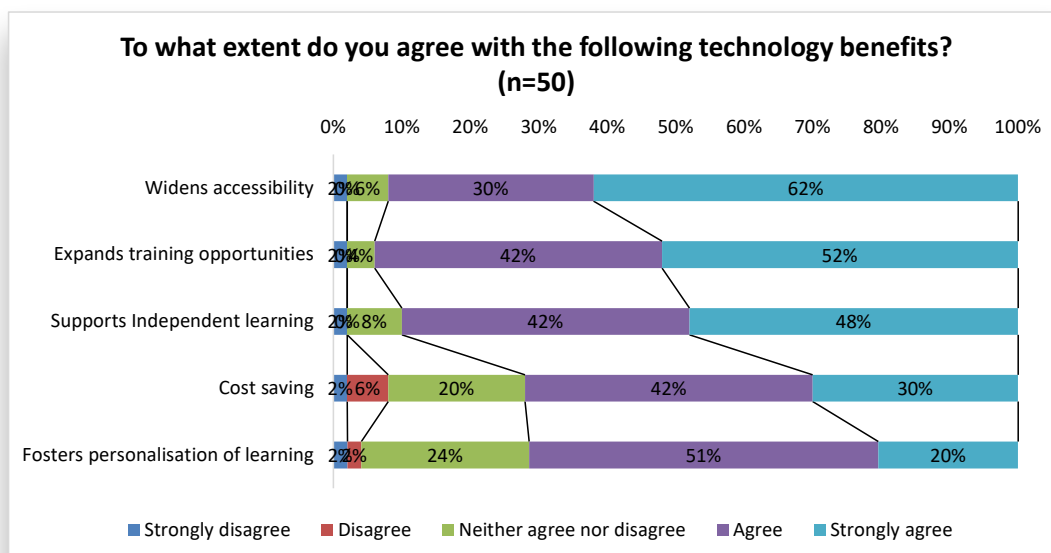
Figure 8:Perceived Technology Benefits in Education/Training

Figure 9 highlights the perceived impact of technology on four areas within an organisation: staff workload outside sessions, formal assessment, learner confidence and social interaction, and learner well-being and mental health. The majority of respondents reported a positive impact on staff workload outside sessions and formal assessment, with 69% and 61% respectively reporting a positive impact. Only a small percentage reported a negative impact on these areas.

However, when it comes to learner confidence and social interaction and learner well-being and mental health, a higher percentage of respondents reported a negative impact, with 28% and 20% respectively reporting a small or large negative impact. For learner confidence and social interaction, 33% reported a small positive impact and 12% reported a large positive impact. For learner well-being and mental health, 27% reported a small positive impact and 16% reported a large positive impact.

There were some mixed views on the impact on learners' engagement. In terms of learner engagement during taught sessions, technology has a large positive impact of 25%. This suggests that the use of technology in the classroom, such as interactive whiteboards or online collaboration tools, can enhance learners' engagement and increase their participation in the learning process. However, it is also important to note that 22% reported a small negative impact on learner engagement. This means about a quarter of people reported large positive impacts while almost the same amount found a small negative impact. This could be due to factors such as technical difficulties or distractions caused by devices, which can hinder learners' engagement.
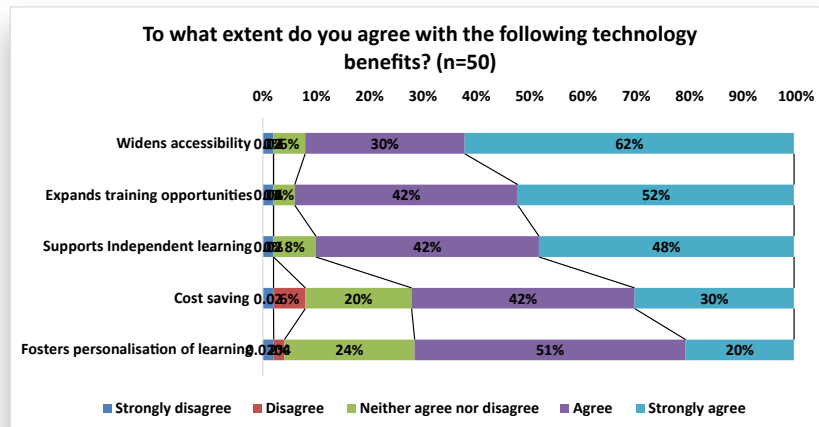
Figure 9: Perceived Impact of Technology

According to Figure 10, the top two barriers to using technology by trainers are a lack of confidence in digital skills and lack of time for digital content creation, with 64% and 59% of respondents selecting these barriers, respectively. These results indicate that the trainers' digital skills and availability of time are crucial factors for adopting technology in training. Additionally, the survey shows that 39% of respondents reported restrictions caused by classroom design, including access to WIFI/hardware, as a significant barrier to using technology. Thus, there is an importance of reliable IT infrastructure and accessibility of WIFI/hardware in classrooms. The findings suggest that up-front cost and ongoing cost are also significant barriers, with 48% and 41% of respondents selecting these barriers, respectively.
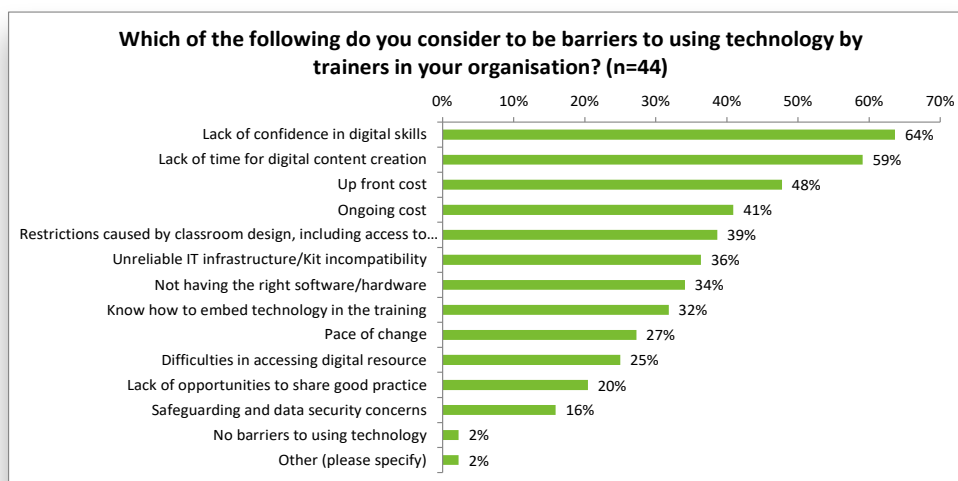
Figure 10: Barriers to Technology Use by Trainers

Figure 11 shows that the most significant barriers to effective technology use for learners are access to digital devices and broadband/connectivity, with 66% and 55% of respondents selecting these options, respectively. The cost was also a significant barrier, selected by 34% of respondents. Learners' unwillingness to use technology was also cited by 30% of respondents. The data suggests that lack of access and connectivity remain significant obstacles to effective technology use, and may disproportionately affect certain populations of learners.
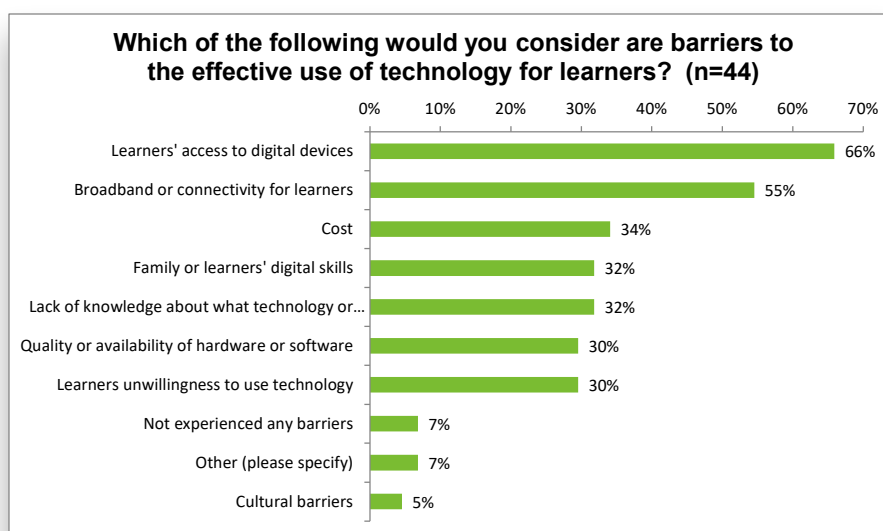
Figure 11: Barriers to Effective Technology Use for Learners

Most respondents agree that technology boosts learning and its use in teaching is widespread. The benefits of technology are recognised, particularly in widening accessibility and training opportunities. However, trainers' lack of digital skills is a primary barrier to technology use, while learners' limited access to devices and connectivity hinders their use. Though technology eases staff workload, online learner engagement is a concern. Overall, technology's impact on education is positive, but addressing these challenges can further enhance its potential.

PROVIDERS' TECHNOLOGY USAGE

Independent Training Providers (ITPs) are using a wide range of technology tools to deliver high-quality training and enhance the learning experience. This research further investigated what kind technology they use in four different areas where DfE (2019) focuses; administration, assessment and teaching practice. We have identified five categories of technology used by ITPs, including Learning Management Systems (LMS) and E-portfolio tools, Virtual Learning and Collaboration tools, Learning Analytics and Diagnostic tools, Technology for Practical and Hands-on Training, and Interactive and AI-powered Learning tools.

Note. DfE. (2019). Realising the Potential of Technology in education: a Strategy for Education Providers and the Technology Industry.

ADMINISTRATION

LEARNING MANAGEMENT SYSTEMS (LMS) AND E-PORTFOLIO TOOLS

LMS and e-portfolio tools are used by ITPs to manage, monitor, and track apprentices' learning progress. Aptem, Blackboard, Moodle, Smart Assessor, OneFile and Marked Apprentices are some of the LMS and e-portfolio tools raised by interviewees. These tools offer various features, including online course delivery, tracking learner progress, and generating reports. E-portfolios are used to document evidence of apprentices' achievements, which can be easily accessed and shared with employers, trainers, and assessors. LMS and e-portfolio tools are essential for managing apprenticeship training efficiently and effectively.

TEACHING PRACTICE

VIRTUAL LEARNING AND COLLABORATION TOOLS

Virtual learning and collaboration tools allow ITPs to deliver apprenticeship training remotely, which is particularly useful in times of social distancing and remote working. Adobe Connect, Zoom, Microsoft Teams, Google Classroom, and Google Meet are some of the commonly used virtual learning and collaboration tools. These tools offer a variety of features, including video conferencing, chat, screen sharing, and virtual whiteboards. Virtual learning and collaboration tools enable ITPs to deliver interactive and engaging training sessions that simulate face-to-face interactions. These tools also allow trainers and learners to collaborate and communicate effectively.

INTERACTIVE AND AI-POWERED LEARNING TOOLS

Interactive and AI-powered learning tools are used by ITPs to deliver engaging and personalised training. Articulate 360 is a commonly used tool that allows ITPs to create interactive e-learning courses that include animations, quizzes, and simulations. AI bots can answer questions and provide instant feedback. Polls, quizzes, Kahoot, Pella, Trello, and Padlet are other commonly used interactive learning tools that can be used to engage and motivate learners.

TECHNOLOGY FOR PRACTICAL AND HANDS-ON TRAINING

Technology for practical and hands-on training includes online video and virtual reality packages, simulation tools, and proctor services for online exams. Online video and virtual reality packages are used to simulate real-world scenarios and provide apprentices with practical training in a safe and controlled environment. Simulation tools allow learners to practice their skills and receive immediate feedback on their performance. Proctor services for online exams ensure that apprentices take their exams in a secure and controlled environment, minimising the risk of cheating.

ASSESSMENT

LEARNING ANALYTICS AND DIAGNOSTIC TOOLS

Learning analytics and diagnostic tools are used by ITPs to gather, analyse and interpret data on learning progress. Power BI and Tableau are commonly used learning analytics tools that allow ITPs to generate data visualisations and reports on learners' progress, including their strengths and weaknesses. These tools can help trainers and assessors identify areas where learners need further support and tailor their training accordingly. Learning analytics and diagnostic tools also allow ITPs to monitor the effectiveness of their training programmes and make data-driven decisions to improve them.

This chapter found providers widely use technology to improve the quality and accessibility of apprenticeship training. Despite technology's positive impact on learning and teaching, trainers' lack of digital skills and learners' limited device access and connectivity pose significant challenges. Technology can reduce staff workload by enabling remote training delivery, but learner engagement and online learning effectiveness remain concerns. Providers use technology in five different categories, including Learning Management Systems, E-portfolio tools, Virtual Learning and Collaboration tools, Learning Analytics, and Diagnostic tools, to improve apprenticeship training's effectiveness, efficiency, and accessibility. These tools have the potential to revolutionise how apprenticeship training is delivered, benefiting all stakeholders.

EXPLORING REMOTE LEARNING: BENEFITS, CHALLENGES, AND GOOD PRACTICE

This chapter analyses remote learning using interview data from providers, examining its benefits, challenges, and good practises. Appendices includes detailed demographic information of the interviews and roundtable discussions participants. With the COVID-19 pandemic leading to a shift towards remote learning, understanding its impact is crucial. Insights gained from the data show both the advantages of remote learning, like flexibility, and the unique challenges it can present to both learners and tutors. The chapter explores strategies for effective remote teaching and learning, emphasising technology's role and the need for interactive learning experiences.

BENEFITS

The interview results showed that remote teaching has three main advantages: flexibility and convenience, improved efficiency and effectiveness, and better trainer-learner interaction. This section provides a detailed explanation of each benefit.

FLEXIBILITY & CONVENIENCE

Remote learning offers learners flexibility and convenience to work on their own terms, in their own spaces, and at their own pace. This fosters personalised and adaptive learning, and promotes inclusivity for those who may have struggled in traditional classrooms. With remote learning, learners who study at a slower pace or are hesitant to participate in a classroom environment can access the same resources from their own spaces. As a result, remote learning creates a more adaptable, inclusive, and accessible learning environment.

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>
> *Remote learning allows work on their own terms, in their own spaces, in their own time. That just opens the door for personalised adaptive learning [...].*

Digital, EdTechCompany

> **"**
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> *[Remote learning] provides an opportunity to be more inclusive in that you're not prohibited from having to travel into a centre if you're somebody who studies at a slower pace or more reticent about speaking in the classroom.*

(Legal, ITP)

Remote learning offers immense convenience and flexibility, especially for individuals with disabilities. It can enable them to have a fulfilling learning experience and/or career without leaving their homes, eliminating the challenges associated with commuting. For instance, an individual who uses a wheelchair can save time, effort, and discomfort associated with travelling. Additionally, remote learning offers a more inclusive and accessible option, where people with disabilities do not have to disclose their conditions, enabling them to focus solely on their work.

> **"**
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> *[...] we have a few people with disabilities who would struggle to travel, and it's opened up the ability for them to have a very fulfilling career as a teacher without having to leave home. We've got one lady, for instance, who's wheelchair bound, and it will take her half a day to get to London, and then a huge amount of time and effort to get home. She can have a very fulfilling career as an expert educator without any of that.*

(Digital, University/HEI)

These benefits can therefore contribute to facilitating a more diverse and inclusive workforce, widening the potential pool of recruits in what is currently an extremely tight labour market.

EFFICIENCY & EFFECTIVENESS

BENEFITS FOR PROVIDERS

Remote learning offers an efficient and effective approach to training as it eliminates the need for travel, premises, and classroom expenses, reducing overall costs, notwithstanding the importance of acknowledging the need for considerable initial and continuous investment in order to maintain these benefits. Whilst supplying tutors with equipment is the main expense, remote learning is generally a cost-effective option that can save organisations a significant amount of money (although it is important to acknowledge the substantial up front and on-going costs needed to establish and sustain the essential technology and learning resources.) For example, interviewees mentioned that the initial cost of purchasing equipment can be balanced out by cost savings in travel and expenses.

> **"**
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> *There is a bit of an upfront cross cost in buying all these equipment such as tablets, mobile phones, laptops. But I suppose the money that you probably saved on travelled and expenses during that time probably covered the cost of the equipment [...]. So, it balances itself out in the end and obviously we can still use the technology that we purchased ...*

(Engineering, ITP)

BENEFITS FOR LEARNERS AND TUTORS

Remote learning benefits both learners and tutors by eliminating the need for physical travel, saving time and reducing expenses. This is particularly advantageous for learners in remote areas, who gain access to high-quality education without long commutes. Tutors also benefit from the convenience of remote teaching, improving their work-life balance.

> " *Since the pandemic, [we became] aware that when we ask somebody to come to a live space, we are potentially asking them to travel quite a long way in order to do so [...] We're asking somebody to travel three hours in order to listen to somebody talk for four hours and then go back on the train another two hours.*

(Business & Administrative, ITP)

> " *They [tutors] are happy with remote learning [...]. It saves them the journey, it saves them money on fuel, and [...] they've got a better work life balance.*

(Engineering, ITP)

BENEFITS FOR LEARNERS AND EMPLOYERS

Employers are increasingly accepting remote learning due to its convenience. It allows learners to participate from their workplace, saving time and leading to better efficiency by applying learnings to real-time situations. Remote learning also offers flexibility, enabling learners to access materials at their own pace and balance work and learning commitments.

> " *Employers didn't want to move their people all over the country and get them into classrooms. They found it much more convenient that someone could go to the workplace and stay in the workplace and do their learning because there is a bunch of protected time which is mandated by the apprenticeship regulations*

(Engineering, ITP)

EPAOs' BENEFITS

Interviewees mentioned that remote EPA allows for increased assessor availability and more effective assessment methods. By eliminating travel time and costs, assessors can more easily manage high volumes of apprentices. Widening access to more remote assessment in apprenticeships in the future helps EPAOs to overcome the challenges posed by the increasing numbers of apprentices they deal with.

> **"**
>
> *[Remote EPA] gives greater availability of assessors by not having to travel, we gain that time back and that gives more effective assessments. [...] [This helps] one of the challenges we come up; the volumes of apprentices we deal with. [...] They are very specific so we are restricted to certain degree of how many people are actually available within the industry to conduct assessment [...]. I think we've learnt to embrace technology to gain those efficiencies.*

(Engineering, EPAO)

IMPROVED TRAINER-LEARNER INTERACTION

Remote learning has brought about significant improvements in trainer-learner interactions. With the removal of travel time, tutors now have more time to interact with apprentices, creating more online resources and extending sessions. The increased flexibility can mean a more frequent meeting schedule, [...] providing more opportunities for learners to connect with trainers and receive support when needed.

> **"**
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> *It's been more effective that they [tutors] are not spending a lot of time on the road. [...] So now they're having more time with the apprentices instead of driving.*

(Education, ITP)

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> *The time that they've saved travelling to places can be put into creating more online resources, and extending online sessions that they could run for longer as well.*

(Engineering, ITP)

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> *One of the benefits we had was when you delivered face to face delivery, we would go and see our apprentices once a month. With teams meetings, we were seeing them every two to three weeks. So, they got a lot more contact with us and we were a lot more flexible and available for them at times.*

(Business, ITP)

In conclusion, remote learning offers a plethora of benefits for learners, trainers, employers, and EPAOs alike. Remote learning offers benefits like flexibility, convenience, efficiency, better interaction, inclusivity, time, and cost savings, although it is important to acknowledge up front and on-going costs needed to establish and sustain the essential technology and learning resources. Learners can customise their experience and study at their convenience.

Trainers can allocate more time for training and interaction. It may therefore help businesses reduce costs and provide flexibility, but it is crucial to recognize the requirement for a substantial initial and continuous investment if these benefits are to be maintained over time. It's a powerful tool to bridge the gap between learning and work.

CHALLENGES

Remote learning has emerged as a crucial aspect of apprenticeships during the pandemic, but it has its fair share of difficulties. An interview delved into the challenges that providers face in three specific areas highlighted by DfE (2019): infrastructure, skills, and safety. The analysis of the interview identified three major challenges: issues with access and connectivity, difficulties in adapting to new technology, and learner engagement. This chapter discusses these challenges in detail.

Note. DfE. (2019). Realising the Potential of Technology in education: a Strategy for Education Providers and the Technology Industry.

INFRASTRUCTURE

WI-FI CONNECTIVITY

Unstable technology and poor Wi-Fi connectivity can significantly affect remote learning by causing frequent disruptions. In interviews, several individuals cited poor Wi-Fi connections as a common issue. For instance, one apprentice had to reschedule her EPA due to Wi-Fi problems, while another learner situated in an area with poor connectivity experienced learning disruptions.

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> *Her [apprentice's] Wi-Fi kept cutting out and we had to postpone it and look at our alternative location for her to do her EPA.*

(Business, ITP)

> 66
>
> *"[...] often the learner is buried in a concrete bunker somewhere, and the WI-FI is not very good and technology is a bit wobbly.*

(Logistic & Transportation SF, Roundtable discussion)

Access to devices and software remains a major challenge in remote learning, especially for apprentices and adult learners. The lack of laptops and computers for some learners is causing real issues for the delivery of apprenticeships and online courses. Additionally, not all learners have access to computers that can handle running the necessary software, which is causing further complications in online learning.

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>
> *We had real issues with apprentices not having the availability of laptops and computers...*

(Business, ITP)

> 66
>
> *Not all of the students have access to computers that can handle running this software that they need to use.*

(Creative & Design SF, Roundtable discussion)

Some interviewees explained that digital poverty may not always refer to the lack of a digital device, but could be the accessibility and compatibility of the systems being used. People may have access to technology but not to systems that work on their devices. This issue is also applicable to workplace PCs, where individuals can be restricted due to firewalls and programme download restrictions imposed by their employers, which further limit accessibility.

> **"**
> *It's not necessarily because they didn't have a digital device. It's just whether the systems that they were being expected to use worked on that. In terms of how we're phrasing that in terms of the digital poverty, they had access to stuff, but they didn't necessarily have the right format..*

(Hospitality & Catering SF, Roundtable discussion)

> **"**
> *If we go back to what they're trying to access on workplace PCs, they were restricted because of firewalls from their employees and also program downloads.*

(Hospitality & Catering SF, Roundtable discussion)

TECHNOLOGY COMPATIBILITY

Employers and apprenticeship providers may face technology compatibility issues. Some employers prefer to use different tools and platforms than those used by the apprenticeship providers. This has caused concerns about whether the apprentices will be able to use the same tools as their employers or whether they will need to be equipped with new ones.

> **"**
> *One of the concerns is that the employer ... wants to be reassured that we can use tools that are compatible with theirs. One really simple example is that we use Adobe Connect as our teaching platform and many of the employers don't like it and they prefer to use something like Zoom.*

(Digital, University/HEI)

> **❝**
> *Some of the challenges are around the different platforms. A lot of companies we work with, some ... wouldn't allow us to use teams, some would allow us to use Google, and then others another one, so that is difficult when you have different cohorts on workshops.*

(Logistics & Transport SF, Roundtable discussion)

Overall, access and connectivity remain significant challenges in the delivery of remote learning for apprenticeships. Addressing these issues will be crucial to ensuring that apprentices can continue their education and training in the face of the post-pandemic.

SKILLS

LEARNER ENGAGEMENT

Remote learning poses unique challenges in engaging learners, with learners frequently muting their cameras and microphones, making it challenging to confirm attendance and engagement. Classroom management in this setting requires a different approach, and distractions at home can make it tough to keep learners focused. The lack of physical interaction makes it difficult to sustain learners' interest, rendering remote learning a challenging experience for both learners and educators.

> **❝**
> *One of the issues you've got is keeping the learners engaged because you might have people of the cameras off, muted, you don't know whether they're actually there or not. [...] It's like a different form of a classroom management, isn't it?*

(Engineering, ITP)

> **❝**
> *Trying to keep them engaged on the actual topic that you want them to be working on during that time is difficult and because of there being distractions [...].Trying to keep them engaged when they're not actually in the physical training centre is really very difficult.*

(Construction SF, Roundtable discussion)

CHALLENGES WITH TECHNOLOGY ADAPTATION

The challenge of remote learning and technology adaptation has proven to be difficult for industries that heavily rely on hands-on experience, such as the construction sector. The lack of computer usage in these fields has made it challenging to teach apprentices how to use technology effectively. Despite growing up with social media and being accustomed to using apps and technology, younger individuals still struggle with basic computer skills.

> **"**
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> *A lot of people did move towards the use of online video to start to teach people to be bricklayers and carpenters and plumbers to an extent. Because at the end of the day it is hand skills. So you've got to be able to do the practical thing. I think the whole thing is designed around being able to physically do it and demonstrate you can physically do it.*

(Construction SF, Roundtable discussion)

> **"**
>
> *[...] it's surprising that although they [younger ones] have grown up with social media and they're all used to using apps and all that, still some of the basic skills on using a computer and Teams and Office and things like that, they can't do it.*

(Construction SF, Roundtable discussion)

SAFETY

The interviews suggest that the use of remote learning has not resulted in significant or widespread safeguarding concerns. However, ensuring learners' safety is a top priority, and various measures have been taken to educate learners on digital safety and maintain a safe online environment. This includes monitoring learners' attendance, submissions, and general engagement, following up with them if necessary and bringing about effective peer-to-peer communication that can be monitored to prevent inappropriate behaviour.

One interviewee raised that identifying potential risks and safeguarding learners in remote learning is challenging because certain concerning behaviours may not be as apparent in an online environment.

> " *The problem that we have is working out when somebody is potentially at risk. [...] some of the things that you would see in a face to face environment you don't see online and vice versa [...] in a face to face environment. I've personally dealt with bullying where someone physically menaces someone and says you will do my work for me, or I'm going to beat you up now. It can't exist online because you can't physically bully someone. If you don't even know where they're located. But you can bully them in other ways. You can put them down in front of the whole of the group. You can do what I call academic bullying. [...] So, there are different forms of behaviour that you see online.*

(Digital, University/HEI)

OTHER AREAS OF CHALLENGES

PREFERENCE FOR PRACTICAL LEARNING

Providers face another challenge: the preference of learners for practical learning. Many young learners come to work-based learning because they did not enjoy academic learning in school and instead value the practical approach. As a result, they tend to prefer hands-on experience over online learning, finding it difficult to engage in theoretical learning through digital means.

> " *[...] delivering construction with 16 - 17 year old young people that don't want to be or do anything online, they just want to come and do the practical. They feel that they didn't enjoy school because they wanted to be doing something practical and they wanted to be doing something outdoors.*

(Construction SF, Roundtable discussion)

NETWORKING

Finally, interpersonal networking has been a challenge for remote learners. Learners miss out on the opportunity to interact with other learners and employees physically. In virtual classrooms, learners do not get the chance to network with people from different departments or have informal discussions during breaks in the same way as in face-to-face encounters. This lack of interaction has been a concern for learners who value social interaction as a crucial aspect of learning.

> **"**
>
> *I think it's physical communication with other learners [...]. If you're in a virtual classroom, you don't get the chance to go and talk to someone at the water cooler, or you very rarely mingle with people who are from a different department. So, some people want to be able to do that.*

(Digital, University/HEI)

Overall, remote learning has posed challenges for providers and learners, including limited access to necessary infrastructure, difficulty maintaining engagement and skills without in-person interaction, and limited opportunities for peer networking and socialisation. Safety concerns, however, have not been a major issue. Addressing these challenges nevertheless remains crucial to ensure remote learning remains a viable and effective option in the future.

GOOD PRACTICE

The preceding section highlighted the challenges that providers encounter when delivering remote learning. The findings indicate that one of the most notable obstacles faced by providers is maintaining learner engagement. Keeping learners engaged is crucial to ensuring that they remain attentive, motivated, and committed to the learning process. This chapter has provided some tips for successful learner engagement in online classes, which will help providers create an environment that fosters active learning and encourages learners to participate in the process.

ENHANCING ENGAGEMENT AND INTERACTION

VIDEO CONTENT

Interview findings suggest that using video content, including YouTube videos, slideshows, and interactive presentations, is an effective strategy to improve learner engagement and participation in online learning. Video content breaks up the monotony of traditional teaching, sustaining learners' interest throughout the course, and provides a more visual and engaging method for learners to interact with the material, helping to maintain their attention.

> **"**
>
> *We embedded some YouTube videos to keep everybody engaged in the group work [...].*

(Engineering, ITP)

> **"**
>
> *So, we're trying to look at far more video based, far more. There's a video, there's some slides, talking heads [...].We really trying to use more content on video.*

(Construction, ITP)

VARIOUS INTERACTIVE LEARNING ACTIVITIES

Incorporating interactive tools and methods in remote learning is crucial to keep learners engaged and attentive. Interactive activities like polls, quizzes, Q&A sessions, group work, and gamification make learning fun and varied, breaking the monotony of traditional methods. Learners actively participate and collaborate with peers, improving motivation, participation, and knowledge retention. Therefore, using interactive learning activities has become an important aspect of remote learning.

> "
>
> *Making things a bit more interactive and you can do like polls and Q&A things and there's all different interactive things that you can do with online delivery that holds people attention a bit more rather than somebody sitting there and having just talking all the time. [...] So, I think much like a classroom, it's keeping it varied and interesting.*

(Engineering, ITP)

> "
>
> *We use vast amounts of plugins and software [...]. Every apprenticeship standard that we deliver, so things like FigJam, the quizzes, the polls [...] there were so many things that they just brought in to animate, and keep them engaged.*

(3Creative&Design SF, RoundTable discussions)

> "
>
> *We've done a lot more group work. So rather than just ask the class, we deliberately put each of the learners into groups.*

(Engineering, ITP)

PEER-TO-PEER COLLABORATION AND SUPPORT

Remote learning can make it difficult for learners to interact and support their peers since they don't have the chance to meet in person. However, utilising breakout rooms can effectively can address this issue by enabling learners to collaborate on projects, work with peers, and receive support from tutors. These virtual spaces can recreate the sense of community and interaction present in traditional classrooms, fostering an environment that encourages peer-to-peer support.

> **"** We tried very much online to replicate what we would be doing in the classroom. For instance, a lot of peer support by using the breakout rooms, and we have quiet breakout rooms where it's almost like a library room in which they can go and work but they still can get access to the tutor if they need be and the tutor can pop in and see how they're going.

(Creative & Design SF, Roundtable discussion)

MAXIMISING LEARNING EFFECTIVENESS

REVISITING APPROACH AND POLICIES

To deliver a successful remote learning provision, institutions must revisit their approach to online learning. They should re-evaluate plans and policies to suit remote teaching and examine factors such as breaks, objectives, technology use, and behaviour policies. Creating a conducive learning environment enhances learner progress. These proactive steps provide learners with necessary resources to excel in online learning and ensure an effective and fulfilling learning experience.

> **"** One of the things that we did was to revisit our approach to online learning from the pandemic. Looking at how simple things like how often you take a break and how you are going to use things.

(Legal, ITP)

> **"** What we did is that we realigned our behaviour policy. And we added in a section on the appropriate use of technology and learning. It wasn't very highly technical. It was looking camera on, microphone on, unless told otherwise. Be on time, be dressed and be sat upright. Simple things. If you are on your mobile phone, ensure that your phones on silent so we don't hear any other calls or texts

(Engineering, ITP)

Breaking teaching sessions into smaller, more focused segments was one of the methods used by many providers for maintaining learner engagement and retention as long teaching sessions, especially in an online environment, can lead to disinterest and loss of focus.

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> *[...] we had to reduce our seminar times down from three hours to two hours and build in more breaks. Just because it is much more intense and trying to stay focused and concentrated and engaged ... not from the learner perspective but from a trainer perspective, you've got a lot more energy.*

(Creative & Design SF, Roundtable discussion)

> 66
>
> *Learners watching like 2 hours of a lecture where someone standing there, we're not doing that. We're breaking it down. [...] we atomised it to five minutes and we try and make it as engaging as possible.*

(Construction, ITP)

MONITORING LEARNER PROGRESS AND ENGAGEMENT

Regularly checking learner progress is vital for successful remote learning. Coaches should frequently engage and communicate with learners to ensure they are on track. Utilising tools to assess participation and attention can help identify struggling learners. Surveys and feedback mechanisms can be used to promote engagement and identify issues. By monitoring progress, coaches can provide guidance and support to help learners achieve their objectives and succeed in their studies.

> " *[Coaches are] required to check with learners very frequently to make sure that they're doing their work, and they're getting on with their learning and their classes.*
>
> *In the virtual classroom, we do things, for instance, like ask learners by name for the answer to a question [...]. There are tools built in that tell you if someone hasn't contributed or interacted or they're not paying attention so that you can flag them up and take action.*
>
> *After every lesson we promote contact with the coach to learners [...] we have surveys, [it asks] what was that online session like? Did you enjoy it? If somebody doesn't fill in the surveys, the coach might call them[...].We do try and build that regular engagement.*

(Digital, University/HEI)

Remote learning challenges require proactive solutions. Interviews suggest engagement and interaction can be enhanced with video and interactive activities. Learning effectiveness can be improved by revisiting policies and monitoring progress. These findings can help educators provide effective learning experiences for remote learners. Addressing challenges is crucial for the success of remote learning, which has become a significant aspect of education.

This chapter has highlighted the experiences of remote learning providers based on interview data analysis. While remote learning presents many benefits such as flexibility and access, it also poses several challenges such as technical difficulties and lack of learners engagement. However, with good practices such as clear communication, interactive learning tools, and learner support, these challenges can be overcome.

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FUTURE TECHNOLOGY PREFERENCES OF PROVIDERS AND THE IMPACT OF AI

COVID-19 accelerated education's tech adoption, revolutionising teaching and learning. Educational providers are now more than ever exploring new ways to leverage technology to enhance the learning experience. This chapter sheds light on some of the technologies that providers are seeking in pursuit of these goals. Additionally, the rise of Artificial Intelligence (AI) is predicted to have a significant impact on various education sectors, including further education. Thus, this chapter examines the opinions of providers on AI and shares their concerns and hopes.

PROVIDERS' FUTURE TECHNOLOGY PREFERENCES

The DfE (2019) identifies procurement, specifically providers' digital procurement capabilities, as an area for development. This research has adapted this area to focus on the technologies that providers want in the future. Based on survey and interview data, the analysis identifies four categories of sought-after technologies: 1) Learning Management Systems and Tools, 2) Interactive and Engaging Learning, 3) Attendance Recording and Tracking, and 4) Integration and Accessibility.

Note. DfE. (2019). Realising the Potential of Technology in education: a Strategy for Education Providers and the Technology Industry.

LEARNING MANAGEMENT SYSTEMS AND TOOLS

→ Learning management system (LMS)

→ Virtual learning environments (VLE)

→ Authoring tools (Articulate Rise, Ice Spring)

→ A one-stop-shop system that combines ePortfolio, VLE, LMS, and learner management systems

→ Learner assessment models

Demand for learning management systems and tools is increasing, providing a virtual platform for learning and enabling learners to access materials and interact with peers and instructors. Key technologies include LMS, VLE, authoring tools, and learner assessment models. A one-stop-shop system combining ePortfolio, VLE, LMS, and learner management is gaining popularity. These technologies are essential for remote and online learning, with endless possibilities for personalised and adaptive learning experiences as technology advances.

INTERACTIVE AND ENGAGING LEARNING

→ Tools that turn learning activities into games

→ Technology that makes learning more interactive and engaging for the learner

→ AI-powered adaptive continuous-learning apps for specialised occupations

→ Games

The desire for interactive and engaging learning tools is driven by the recognition that learner engagement is one of the challenges in remote learning. Technologies that turn learning activities into games and those that make learning more interactive and engaging for learners are increasingly popular. Additionally, AI-powered adaptive continuous-learning apps for specialised occupations are gaining traction. These findings suggest that there is a need for innovative learning tools that can keep learners engaged and motivated throughout the learning process.

ATTENDANCE RECORDING AND TRACKING

→ Automation of attendance recording

→ Automatic tracking of learner attendance and engagement

→ Collection and storage of attendance data

The desire for attendance recording and tracking tools in the future highlights the need for streamlined and efficient attendance management systems. Automation of attendance recording and collection of attendance data could potentially reduce the workload of educators and increase accuracy. The automatic tracking of learner attendance and engagement could aid in identifying areas for improvement and promoting learner success. The implementation of such technologies could have a positive impact on both educators and learners, making attendance tracking more efficient and effective.

INTEGRATION AND ACCESSIBILITY

→ Integration of multiple learning tools and features in one place
→ Seamless integration of data and systems to reduce duplication and manual data entry
→ User-friendly and easy-to-navigate platforms that are accessible to everyone
→ Apps that support high quality video capture and accessibility
→ Exam software that is available for devices other than laptops such as tablets

The need for accessible and integrated future technologies is driven by the desire to simplify processes and ensure access for all. This involves integrating multiple learning tools and features in one platform, seamlessly integrating data and systems, and providing user-friendly and accessible platforms. Additionally, there is a demand for exam software that is available for devices other than laptops such as tablets. Overall, people want technology that is inclusive, efficient, and easy to use, with a focus on apps that support video capture and accessibility.

In conclusion, the analysis of survey and interview data reveals that organisations are seeking technologies that enhance learning and accessibility, enable effective attendance tracking, and promote engagement and interactivity in the learning process. By leveraging these technologies, organisations can create a more effective and engaging learning environment, improve learning outcomes, and meet the needs of diverse learners.

PROVIDERS' PERSPECTIVES ON THE FUTURE IMPACT OF AI IN FURTHER EDUCATION

Artificial Intelligence (AI) is expected to bring significant changes to the further education sector. This has led to a growing interest in the opinions of providers on AI and its potential implications for education. In this section, we explore the perspectives of education providers, discussing their concerns and hopes as they navigate the use of AI in education. Through this exploration, we aim to gain a better understanding of how AI may shape the future of learning in the further education sector.

CONCERNS ABOUT THE IMPACT OF AI

Interviewees raised concerns about the potential misuse of AI technology in the education sector. They emphasised the importance of responsible use of AI-powered tools. Providing learners with the necessary skills and knowledge to cope with emerging technologies is vital to prevent misuse and ensure ethical practises.

> 66
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> *I think the accounting profession is under another threat [...] They're very good at evolving. So, they will be looking at how do we use ChatGPT.*

(Legal, ITP)

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> *Business admin, quals team leaders management saw different things on there that could potentially be abused.*

(Engineering, ITP)

Another concern raised about AI is its potential to exacerbate connectivity poverty, which could hinder learners from accessing and benefiting from AI-powered tools in further education. Limited internet and technology in certain areas create a digital divide, hindering education opportunities. Many rely on mobile phones and data costs, which could result in a gap between those who can and cannot afford AI tools, further widening the divide and negatively impacting social mobility.

> 66
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> *[...] if we're going to rely on this as a tool, we're going to see this gap emerge between the haves and the have not. [...] we've got to be mindful that everybody has access to the same opportunities.*

(Logistics & Transport, Roundtable discussion)

In conclusion, providers highlighted it is crucial to prioritise responsible use and ensure that learners are equipped with the necessary skills to use AI ethically. Additionally, addressing the digital divide is crucial to ensure equitable access to AI-powered tools and prevent further inequalities in education opportunities.

AI AS AN OPPORTUNITY

The interviews provided insights into how AI can be leveraged to enhance the learning process rather than replace human instructors. The focus is on using AI as a tool to augment the teaching experience and provide learners with individualised learning plans, using technology to enable good teaching, generating specific notebooks for learners that contain various tools, data, and instructions, allowing them to complete tasks more efficiently. AI can also be used to develop individualised learning plans, based on a learner's existing knowledge and performance.

TOOL TO ENHANCE LEARNING EXPERIENCE

Providers highlight the benefits of using AI-powered tools like Chat GPT to enhance, not replace, teaching. These tools can provide supplementary information, identify knowledge gaps, and act as virtual mentors accessible outside normal hours. They can be particularly helpful for those with learning disabilities or for whom English is not their first language.

> **"**
> *I think I'm more about technology to enable good teaching rather than technology to replace good teachers.*

(Construction, ITP)

> **"**
> *AI-powered tools like Chat GPT can certainly augment the learning process and they shouldn't be seen as replacement … they're a useful tool. It can provide learners with supplementary information. […] GPT in particular can help learners to identify knowledge gaps and areas where they need additional support, which you can address with more targeted and personalised hands-on training. […] It can provide learners with a virtual mentor or coach which doesn't replace, but is additional and is accessible at hours outside of normal hours of operation.*

(Engineering & Manufacturing & Automotive, Roundtable discussion)

OTHER OPPORTUNITIES

Other than these opportunities, providers suggest that AI can create scenarios to evaluate AI-generated essays, helping learners apply answers to real-world situations.

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> *But it [AI] is an opportunity. [For instance] AI can develop an essay and then the learner critically appraise it. So, you've got a scenario that replicates the real world. How is that answer that you've produced applying to that particular scenario? How is that answering that businesses question? So, I think there's an opportunity there as well.*

(Legal, ITP)

AI can also mark essays and provide quick, standardised feedback. AI has potential to revolutionise teaching and assessment, providing efficient, standardised feedback to learners.

> 66
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> *I'm also talking to a company about AI marking. [...]. Having the equipment of ChatGPT produce SAR answers that could be used to train an AI marking tool. [...] assess our scripts, and [...] they get feedback more quickly, [...] standardised [...].*

(Legal, ITP)

The interview revealed that many providers view AI as a positive opportunity in further education. AI-powered tools like Chat GPT enhance learning and provide customised plans. They act as virtual mentors accessible outside normal hours, helpful for those with learning disabilities. AI-generated materials enable more personalised education, reducing time from days to minutes. Encouraging AI in education enables good teaching and efficient learning.

In conclusion, the future of education is rapidly changing with the introduction of new technologies such as AI. Providers are optimistic about the benefits AI can bring to education, such as learning enhancement personalised learning. However, they also have concerns about the misuse of AI technology and the potential for it to widen existing inequalities.

CHAT GPT'S RESPONSE TO THE POTENTIAL IMPACT OF AI ON WORK-BASED LEARNING IN THE FUTURE

What is the impact (pros and cons) of AI like chatGPT on further education, particularly work-based learning and its future in FE?

AI like ChatGPT can have both positive and negative impacts on further education, particularly work-based learning, and its future in FE. Here are some potential pros and cons:

Pros:

1. Personalized Learning: AI can analyze a student's learning patterns and suggest personalized content and teaching methods to help them learn better.
2. Automation of Grading and Feedback: AI can automate the grading process, reducing the workload on teachers, and providing immediate feedback to students, which can improve their learning experience.
3. Improved Accessibility: AI-powered tools can be designed to assist students with disabilities or special learning needs by providing real-time assistance and accessibility features.
4. Enhanced Collaboration: AI can facilitate collaboration among students and between students and teachers by providing a platform for communication and sharing ideas.

Cons:

1. Lack of Human Interaction: AI can potentially reduce human interaction, which is an important component of education and can limit the development of social skills.
2. Potential Bias: AI algorithms can be biased based on the data sets used to train them, which can lead to discriminatory outcomes.
3. Job Losses: The automation of certain tasks using AI can lead to job losses in certain areas, such as grading and administrative tasks, which can impact the job market.
4. Security Concerns: AI systems can potentially be hacked or compromised, which can lead to data breaches and privacy violations.

Overall, AI has the potential to improve work-based learning and its future in FE by providing personalized learning, automating grading and feedback, improving accessibility, and enhancing collaboration. However, it is important to be aware of the potential negative impacts, such as reduced human interaction, bias, job losses, and security concerns.
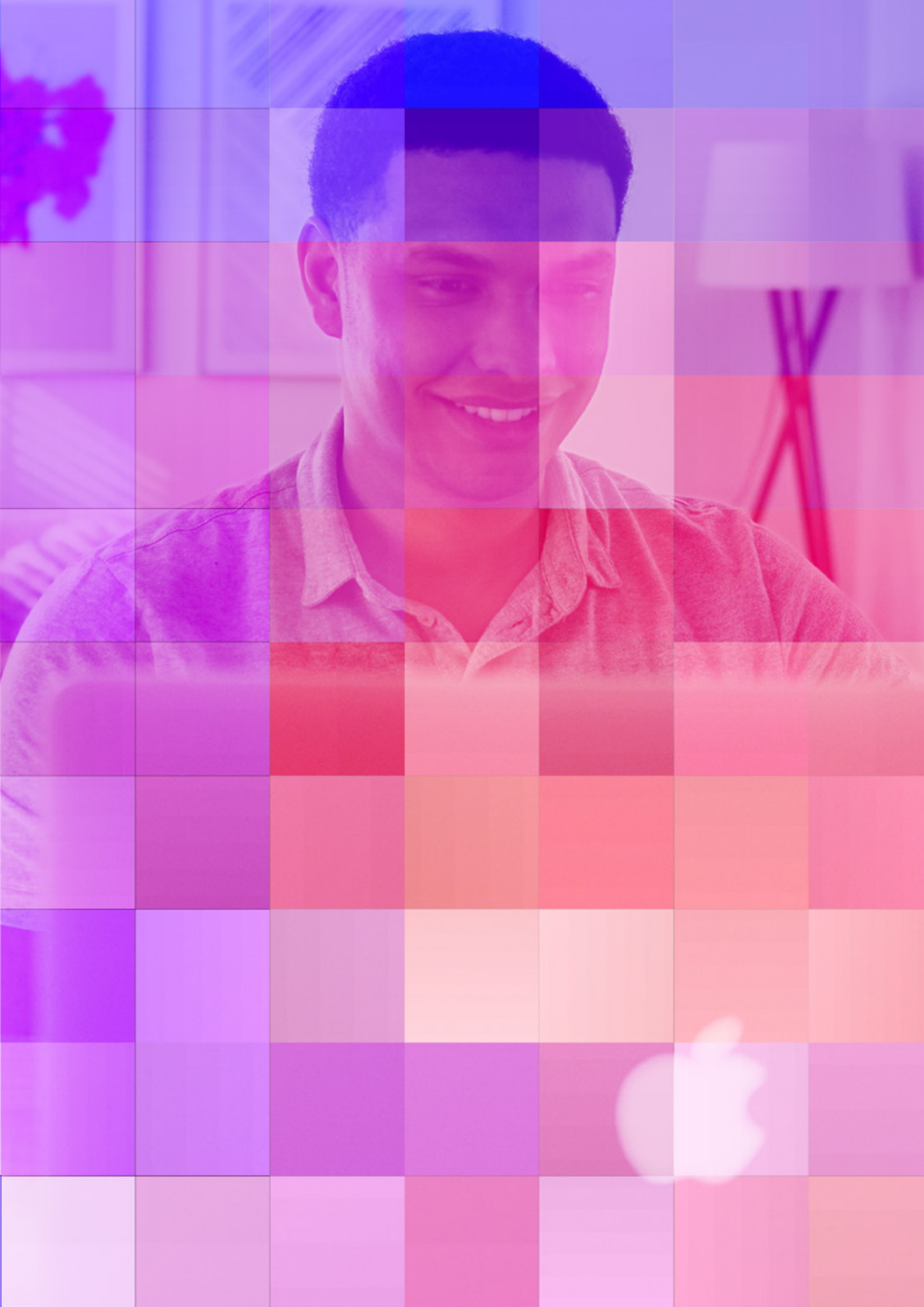
CONCLUSIONS AND RECOMMENDATIONS

The purpose of this research was to gain insight into the educational technology being used by providers and to identify the associated benefits, challenges, and best practises. To achieve this goal, a mixed methods approach was utilised, including surveys, interviews, and roundtable discussions. The resulting findings are outlined below.

Data suggests that remote learning remains prevalent even after the pandemic, with a combination of remote and in-person methods being the primary mode of training provision. The providers stated that they have been utilising learning technology more frequently, specifically virtual classrooms, learning management systems, and videos. These tools are being employed in different areas that the DfE emphasises, such as administration, assessment, and teaching practises. Moreover, most respondents (85%) showed willingness to adopt new technology to enhance the learning experience.

The respondents perceive technology to have a positive impact on training, as evidenced by their agreement with technology benefits such as widened accessibility and expanded training opportunities, particularly for individuals in remote areas and with disabilities. Remote learning is also cost-effective, eliminating the need for travel, premises, and classroom expenses, saving both learners and tutors time and money, although it is important to acknowledge the substantial up front and on-going cost needed to establish and sustain the essential technology and learning resources. Furthermore, remote learning offers improved trainer-learner interaction, as tutors now have more time to interact with learners, creating more online resources and extending sessions.

Providers report barriers to technology use by trainers, including lack of Wi-Fi, devices, and digital skills. These fall under 'infrastructure' and 'skills', DfE (2019) focus areas to address the issue. Poor Wi-Fi connectivity can significantly affect learning, causing frequent disruptions. Lack of accessibility and compatibility of the systems being used were also raised as concern.

Learner engagement during taught sessions emerged as an area of interest, with a quarter of the respondents reporting a large positive impact on engagement and a similar proportion reporting a small negative impact. Further investigation through in-depth interviews reveals that many providers face challenges with learner engagement in online classes. This is due to the lack of physical interaction, which makes it difficult to sustain learners' interest, and the distractions at home that can hinder their focus. In order to solve these challenges, interviews found providers practice various effective strategies.

To maintain learners' engagement and interest, providers use video content and interactive learning activities such as quizzes, Q&A sessions, group works, and games are crucial. Also, more fundamentally, it is important to revisit the organisations' approach and policies to remote learning, including creating a conductive learning environment, breaking teaching sessions into smaller segment, and regularly checking learner's progress. Frequent communication, assessment, guidance, and support from coaches are crucial for promoting engagement, identifying issues, and ensuring successful remote learning.

Based on the strategies implemented by different providers, it can be inferred that those who employ remote learning and utilise multiple content formats to enhance learner engagement reported a positive impact of remote learning on leaner's engagement. In contrast, providers who did not tailor their class to remote environment found it challenging to increase engagement and reported a negative impact. As a result, the survey yielded mixed results regarding the effectiveness of remote learning on learner's engagement.

Providers shared opinions on future technologies they seek, grouped into four categories; learning management systems and tools, interactive and engaging learning, attendance recording and tracking, and integration and accessibility. These technologies highlight the importance of innovation in educational technology that can keep learners engaged and motivated throughout the learning process while simplifying processes for educators.

Reflecting on these future technologies that providers seek, EdTech companies should offer adaptive learning software for different devices and internet connections. They should provide interactive activities with gamification, AR, and VR, along with a mobile app for wider accessibility. Additionally, attendance tracking, comprehensive learning management systems, video capture tools, and collaborative learning tools should be implemented to monitor engagement, accessibility, and interaction. These measures improve learning and productivity for learners and tutors.

AI is a transformative technology with significant impacts on education. Some providers raised concerns about its potential misuse, contribution to connectivity poverty, and creation of a digital divide hindering access to AI tools. They stressed responsible use and equipping learners with ethical skills. Addressing the digital divide is crucial to ensure equitable access to AI tools, mitigating inequalities in education.

However, the majority of providers believe AI is a positive opportunity in further education, leading to effective teaching and learning. AI-powered tools like Chat GPT can act as virtual mentors, provide supplementary information, and identify knowledge gaps, while AI-generated materials enable more personalised education with individualised learning plans. These tools can be particularly helpful for learners with learning disabilities and those who are non-native English speakers. Therefore, they perceive AI as "technology to enable good teaching rather than technology to replace good teachers."

RECOMMENDATIONS

Based on the research findings, the report recommends the following actions:

1. INVEST IN TECHNOLOGY INFRASTRUCTURE

The UK government should place a strong emphasis on investing in technology infrastructure, particularly in remote and underserved regions, in order to ensure equitable access to education. This involves improving and expanding Wi-Fi connectivity.

In March 2021, BDUK launched Project Gigabit with the aim of bridging the digital divide by significantly improving connectivity for households and businesses. Furthermore, BDUK has set a target of achieving 95% 4G coverage across the entire UK by the end of 2025, facilitated by the £1 billion Shared Rural Network programme. It is hoped that these initiatives will lead to prompt improvements in Wi-Fi access. Investing in infrastructure is crucial to enable remote learning and bridge the digital divide, ensuring equal opportunities for all students.

2. FOSTER COLLABORATION AND KNOWLEDGE SHARING

Existing sector bodies, alongside the UK Government, should create a further education 'What Works' group, like existing programmes in the school and higher education sectors. This group would form a valuable place for knowledge sharing and create safe spaces for collaboration. Creating platforms for ITPs to exchange best practice, success stories, and lessons from technology-driven training is crucial.

AELP, in collaboration with Ufi, has created Sector Share (https://sectorshare.org.uk/) as a collection of cost-free resources available for providers and employers to utilise in online delivery. It is strongly recommended that ITPs make use of these free courses to enhance their digital skills and pedagogy. Encouraging collaboration enables learning from triumphs and obstacles, driving effective strategies for technology integration in further education. This approach ensures continuous improvement and advancement of UK's educational practises.

3. DEVELOP CONTINUOUS PROFESSIONAL DEVELOPMENT (CPD) PROGRAMMES FOR DIGITAL SKILLS AND PEDAGOGY

Existing sector bodies should support ITPs for tech integration in teaching through workshops, certifications, and online courses.

The Apprenticeship Workforce Development (AWD) programme, funded by the DfE, was initially launched in 2021 to support staff at all levels and roles delivering apprenticeships across Further and Higher Education settings. Its second phase launched in August 2022, and is currently being designed and delivered by the Education and Training Foundation (ETF) in partnership with the Association of Employment and Learning Providers (AELP), Association of Colleges (AoC), Strategic Development Network (SDN) and University Vocational Awards Council (UVAC). New CPD resources are currently being developed following a process of training needs analysis (TNA), which involved a sector-wide survey, series of focus groups, sector research, and the expertise of all delivery partners. These new CPD resources, informed by the TNA process, will be delivered in Autumn 2023.

ITPs should be encouraged to actively engage with the programme in order to enhance their digital skills and pedagogy to ensure instructors are well-prepared to enhance teaching and learning outcomes through technology tools and platforms, contributing to improved education standards and quality of apprenticeship delivery.

4. PROVIDE FINANCIAL SUPPORT FOR DIGITAL ACCESSIBILITY

The UK government should allocate suitable funding that considers the upfront and ongoing costs of IT infrastructure, taking into account the significant benefits that technology can bring to work-based learning. This support should prioritize digital accessibility, including the establishment of guidelines and standards for inclusive learning materials and platforms. By providing financial assistance, institutions can overcome barriers and ensure equal opportunities for students.

5. PROMOTE ETHICAL USE OF AI IN EDUCATION

The UK government must establish guidelines for ethical AI use in education, encompassing responsible deployment, data privacy, and transparent algorithms. Collaborating with ITPs to incorporate ethics and responsible AI into the curriculum is crucial. The Department for Education (DfE) released a policy paper on generative AI in education in March 2023.

However, the paper lacks clarity regarding human judgement, data privacy and security, and specific recommendations. Therefore, it is necessary to provide more specific examples, actionable guidelines, and comprehensive discussions on the collaboration between humans and AI, data privacy, and the integration of AI in education. It is important to note that the government is planning to publish an AI Regulation Roadmap, and it would be advisable to review it for further insights.

Implementing the recommendations allows ITPs to harness technology's benefits in training, overcoming obstacles and creating inclusive, engaging learning environments for all.

By implementing these recommendations, ITPs can effectively leverage the advantages of technology in their training. This enables them to overcome challenges and foster inclusive and engaging learning environments that cater to the needs of all learners

> **❝**
> *(For those with) learning disabilities or SEND community or if this is not your first language, this [AI like ChatGPT] again is a hugely transformative tool. I think as long as the work originates from the learner and they can demonstrate a sense of understanding, using [Chat GPT] should be encouraged.*

(Logistics & Transport, Roundtable discussion)

CUSTOMISED LEARNING PLANS AND QUICK CONTENT CREATION

AI is used to quickly generate individualised learning plans and specific notebooks by feeding in instructions, code, data, and articles. This method is faster and more efficient than traditional methods, reducing the time taken from days to minutes. AI-generated materials can provide more personalised education to learners.

> **❝**
> *We're using AI to generate specific notebooks for specific applications. It's got all of these things, bits of code, instructions, bits of data, even articles, and stuff to read. What used to take days of labour can be done within minutes. I've heard examples of people building a new notebook from scratch within 60 minutes where it normally it might have taken two or three days.*
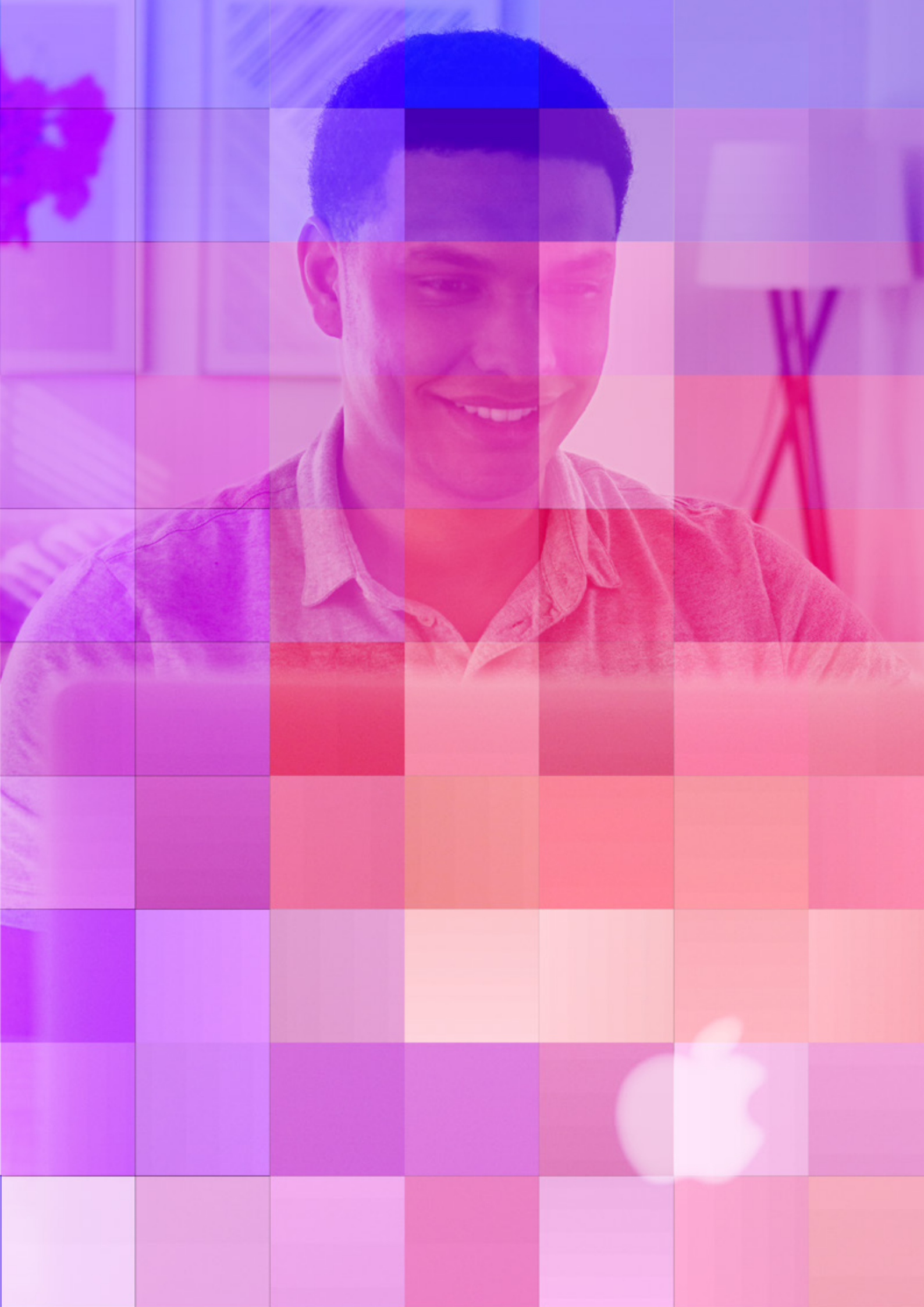
(Digital, University/HEI)

> **❝**
> *We're looking at ways of using it to generate individualised learning plans. [...] feed it into an AI tool, and it uses that to generate a much more detailed, individualised learning plan that goes right down to individual concepts.*
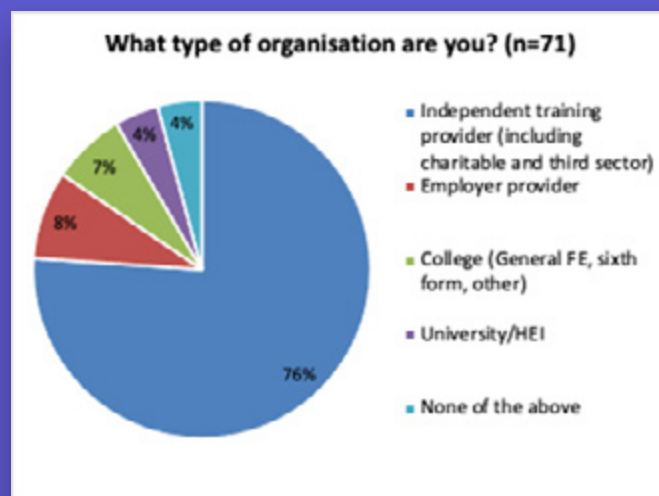
(Digital, University/HEI)

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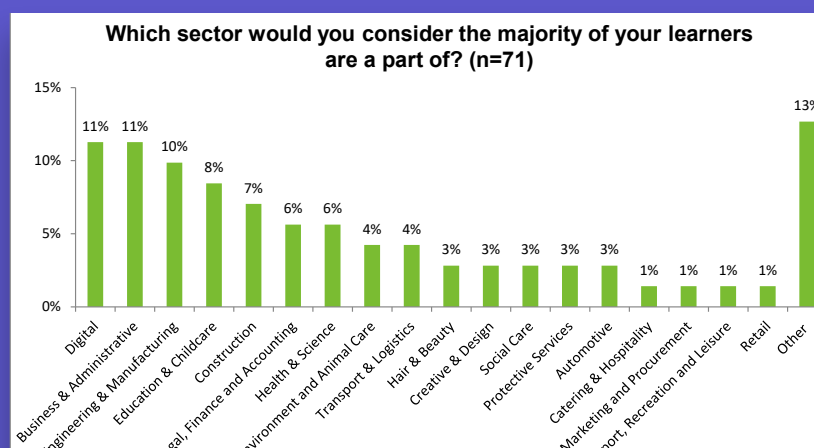
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APPENDICES

TYPE OF ORGANISATION

What type of organisation are you? (n=71)

- Independent training provider (including charitable and third sector): 76%
- Employer provider: 8%
- College (General FE, sixth form, other): 7%
- University/HEI: 4%
- None of the above: 4%

SECTOR DISTRIBUTION OF THE RESPONDENTS

Which sector would you consider the majority of your learners are a part of? (n=71)

- Digital: 11%
- Business & Administrative: 11%
- Engineering & Manufacturing: 10%
- Education & Childcare: 8%
- Construction: 7%
- Legal, Finance and Accounting: 6%
- Health & Science: 6%
- Environment and Animal Care: 4%
- Transport & Logistics: 4%
- Hair & Beauty: 3%
- Creative & Design: 3%
- Social Care: 3%
- Protective Services: 3%
- Automotive: 3%
- Catering & Hospitality: 1%
- Marketing and Procurement: 1%
- Sport, Recreation and Leisure: 1%
- Retail: 1%
- Other: 13%

REGION OF ORGANISATION'S HEAD OFFICE

In which region is your company's head office based? (n=71)

Region	%
London	15%
South East	15%
North West	14%
South West	14%
West Midlands	14%
East of England	10%
North East	4%
Yorkshire and the Humber	4%
East Midlands	3%
Scotland	3%
Wales	3%
Northern Ireland	0%
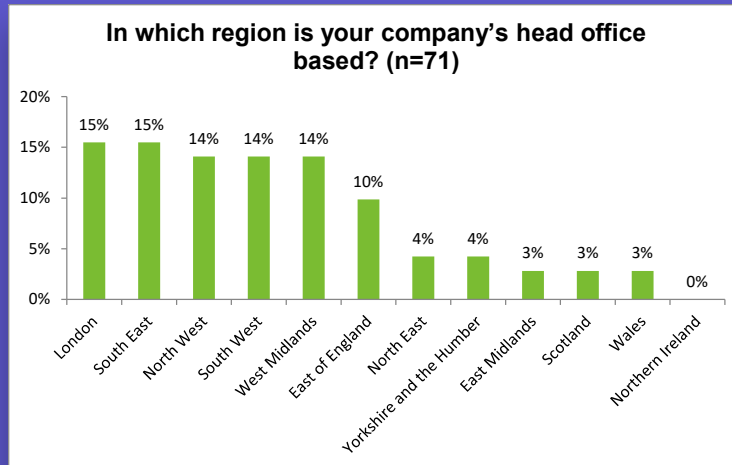
TOTAL FULL-TIME EQUIVALENT EMPLOYEES IN THE ORGANISATION

How many full-time equivalent people does your company employ in total (Not including sub-contractors or temporary staff)? (n=71)

	%
1-9	18%
10-49	27%
50-249	21%
250 or more	34%
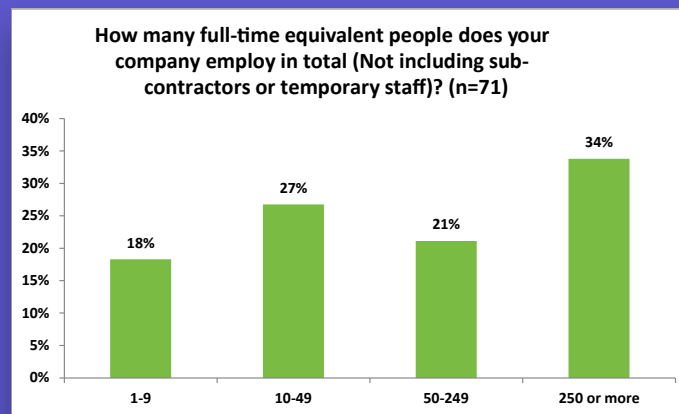
Demographics of the Interviewees

	Type	Main Sector
1	ITP	Business, Administration & Law
2	Other	Information & Communication & Technology
3	ITP	Construction, Planning & the Built Environment
4	EPAO	Engineering & Manufacturing Technologies
5	University/HEI	Information & Communication & Technology
6	ITP	Business, Administration & Law
7	ITP	Engineering & Manufacturing Technologies
8	ITP	Education & Training
9	EPAO	Engineering & Manufacturing Technologies
10	ITP	Engineering & Manufacturing Technologies
11	ITP	Business, Administration & Law

Demographics of the Roundtable Participantsa

	Sector Forums
1	Sport &Recreation
2	Construction
3	Creative & Design
4	Engineering, Manufacturing & Automotive
5	Hospitality & Catering
6	Logistics & Transport

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