WFCP
World Federation of
Colleges and Polytechnics

ANALYTIC LEARNING
RESEARCH, INSIGHT & POLICY FOR GLOBAL EDUCATION & SKILLS

Harnessing Artificial Intelligence in Professional Technical Education and Training

A GLOBAL STATEMENT

by the World Federation of
Colleges and Polytechnics

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Contents

Foreword

As our understanding of Artificial Intelligence (AI) continues to evolve, so does the realm of research. In this Statement, we delve into the impact, applications and implications of AI for labour markets and for professional technical education and training (PTET) Institutions.

AI transcends disciplinary boundaries and redefines possibilities. It is also transforming the field of PTET. WFCP recognises that AI is disruptive to the fundamental way in which PTET institutions function. In this regard, it is important to understand how AI can support PTET with learning and teaching strategies, as well as with administrative processes in education. Some of its opportunities include automated assessment processes, virtual and immersive reality, personalised learning experiences and personal tutoring.

It is also important to gauge the use and potential of AI across the world, and to rectify disparities in access. As innovative as AI is, it also has certain risks around data, cybersecurity, algorithmic bias, privacy and learner safety and wellbeing which leaders and stakeholders in the PTET industry should be aware of.

The purpose of this Global Statement is to add to the evidence base for PTET at a time of a growing global demand for skills. It highlights some of the key trends, opportunities and risks of AI, and provides some recommendations around these risks. The research is aimed at policy makers, practitioners and PTET Administrators and Educators.

This statement identifies the opportunities for AI to enhance learning, teaching and equity of access. It also includes a general overview of the current utilisation of AI in the PTET sector, and an estimation of its future utility and developments. It also reviews case studies, insights into future developments and AI tools such as generative AI. Furthermore, it provides recommendations for an ethics framework around the use of AI and potential risks which touch on assessment, malpractice, data ownership, as well as the mitigation of an increase in digital poverty across the globe.

This statement is representative of the WFCP and all its members, and seeks to have application at international, national and local levels. It casts a forward-looking perspective and is an exploration of how AI is expected to impact PTET and the workforce of the future.

Grateful thanks go to Joel Mullan of Analytical Learning, who led this research, along with the many WFCP members, who generously contributed their time, insights, and expertise to shape the contents of this statement. Thanks also go to Michael Webb of Jisc who provided an expert review of the draft report, Lyne Dalby who managed the project for WFCP, and WFCP's project steering group, including Dawn Wood and Emma Meredith.

Dawn Ward CBE DL
Chair, WFCP

Executive Summary

There are significant opportunities for AI to improve learner outcomes, and assist with institutional challenges in the PTET sector

There is relatively little systematic data available on the current use of AI technologies in the PTET sector – but the majority of WFCP members consulted during this research were in the early stages of AI maturity, experimenting with AI solutions, and exploring where AI could be used to help optimize their work. Relatively few had fully embedded it into business-as-usual teaching and learning. WFCP members taking part in consultations were overwhelmingly positive about AI and its perceived potential benefits.

Compelling case studies identified include:

- ✓ Generating teacher-facing and learner-facing digital content
- ✓ Enabling personalized and adaptive learning
- ✓ Providing new insights for decision-making
- ✓ Supporting teachers and their professional development
- ✓ Supporting learner inclusion through assistive technology

Case studies focused on supporting teachers appear to be particularly promising and should be the immediate focus for any institutions taking their first steps into exploring applications of AI. Representatives of WFCP member institutions reported that a major motivation for the adoption of AI tools was to save staff time – with one participant noting that some staff were reporting time savings of 5 to 6 hours per week.

Automation of administrative and operational processes was seen as "low hanging fruit" for AI adoption, with less inherent risk than teaching and learning applications, and the potential to realize cost savings that could be redirected into teaching, learning and other priorities.

There was significant interest in the use of AI in assessment, with the potential for AI solutions to reduce marking time or to allow for personalized feedback to be provided to a greater extent than would otherwise be possible. However, experiments with AI assessment to date have highlighted challenges with reliability, transparency and accountability.

The use of AI systems also introduces significant risks and uncertainties – at both the institutional level and system level.

- With 3 in 4 people in low-income countries still offline, greater use of AI could deepen the digital divide
- Content or insights generated by AI systems may not be reliable. AI systems often produce material which is factually incorrect and can amplify the cultural norms and problematic societal biases contained in its training data. Large language models perform better in English than other languages.
- The "black box" nature of many AI systems means that it is not clear why AI systems come up with particular insights – with a consequent lack of transparency, explainability, and auditability.
- AI solutions may generate content or embed approaches that are not grounded in appropriate pedagogy.
- There are learner safety, cyber-security and legal risks that need to be managed.
- Reliance on AI could result in a narrowing of the competencies developed by learners – or de-skilling of teaching staff.
- There is currently limited robust evidence that use of AI will lead to better outcomes.

It would be beneficial for education and training systems to develop standards on what ethical use of AI in the education sector requires, and, crucially, what this means in practice.

The adoption of AI solutions in the wider economy is likely to lead to changes to jobs. This will in turn demand an updating of the curriculum being delivered in PTET institutions.

Changes in jobs will include job replacement (AI taking on occupations previously done by humans); job augmentation (requiring humans to use AI tools and technologies in their occupations) and job creation (new occupations created).

All PTET institutions will need to ensure that all learners are given the opportunities to develop

- ✓ the transversal and cognitive skills (problem-solving, critical thinking, communication, teamwork) that they will need to use AI applications, and to navigate labour market shifts caused by automation
- ✓ digital literacy
- ✓ basic critical understanding of AI

PTET institutions may also need to respond to demand from employers, and develop specialized courses providing opportunities for learners to develop occupational skills in AI-related disciplines.

PTET institutions will need to develop a workforce with knowledge and understanding of how to integrate AI into learning, teaching, and institutional management.

This will require investment in training and continuous professional development for staff, providing them with the knowledge and understanding to explore how AI could improve their practice. Senior leadership in institutions will need to be AI-literate, and able to scan the landscape to identify the opportunities to use AI to improve institutional performance.

Staff may have legitimate concerns about aspects of AI technologies, for example around data protection, job displacement, and misuse of the technology, that institutions should take seriously. PTET institutions should put in place mechanisms for staff using AI solutions to share any concerns they develop about how the technology is being used.

Ultimately, AI is not an innately positive or negative technological development. AI's impact will depend on the way it is used.

AI presents significant opportunities for PTET institutions to enhance outcomes for learners and provides potential new mechanisms to tackle some of the big challenges that institutions face. However, using AI also involves taking on risks that it is crucial that institutions are aware of and actively managing. Applied in the wrong way AI could result in a degradation of learning experiences, or expose learners to new risks.

PTET institutions and other sector stakeholders should therefore 'proceed with caution' – exploring applications of AI to learner challenges and institutional challenges, but grounding their decision-making in the interests of learners, and considerations of equity, fairness and human-centredness.

Recommendations

01

Challenge-based exploration of AI. All PTET institutions should dedicate some resources to exploring the implications of AI for how they operate. PTET institutions should not adopt AI for its own sake, but instead take a challenge-led approach to exploring case studies for AI – identifying areas where students or staff currently experiencing challenges and considering whether AI solutions could materially help improve performance in that area.

02

Be intentional. PTET institutions should be intentional about what they choose to automate using AI tools. There may be some functions that, on balance, institutions choose to continue to do using people rather than technology. This could include, for example, case studies where institutions determine it is preferable to maintain human interaction or case studies that are considered to be particularly high-risk or sensitive.

03

Reflect developments in industry and labour market demand. PTET institutions should actively monitor (including through skills anticipation, labour market analysis and engagement with employers) how AI is being adopted in the occupations that they are training learners for. Institutions should update courses, where necessary, to include exposure to the AI approaches likely to be used in industry. All learners should be given the opportunities, through their programmes of study, to develop:

- the transversal and cognitive skills (problem-solving, critical thinking, communication, teamwork) they will need to use AI applications, and to navigate labour market shifts caused by automation
- digital literacy
- basic critical understanding of AI

04

Retraining opportunities for workers impacted by AI. Governments and employers should partner with PTET institutions to help citizens navigate the implications of AI on their careers. PTET institutions should support citizens whose jobs will be changed or replaced by automation by developing and providing upskilling and retraining programmes. Such programmes will need to be inclusive, targeted to learners' needs and as accessible as possible, including where necessary changes to modes of delivery, outreach, and content.

05

Evidence and piloting. PTET institutions should conduct pilots and small-scale experiments before deciding to implement particular AI solutions across their institutions. This allows for the efficacy of the intervention to be assessed, and for the optimal mechanisms for implementation to be identified. AI solution developers (and philanthropies/funders) should invest in robust evaluation of the impact that solutions have on learning outcomes and learner wellbeing.

06

Digital infrastructure. Development of AI solutions should include solutions that do not require constant internet access or high levels of device ownership – so that the benefits of AI are not confined to high-income communities, countries and groups. Governments, development agencies and the private sector should look to accelerate initiatives to improve digital infrastructure so that communities that do not currently have sufficient access can benefit from applications of AI.

07

AI literacy and staff development. PTET institutions should develop AI literacy modules that provide learners with an understanding of the limitations of AI, and the knowledge and skills necessary to be able to critically assess the credibility of material produced using generative AI. PTET institutions should develop CPD offerings for their staff – covering how AI works, its risks and limitations, legal requirements, and the institution's approach to AI.

08

Protecting the integrity of assessments. PTET institutions should review the approach they take to assessment of student performance – and look at changes which may be required to protect the integrity of assessments. Learners should be issued with clear guidance on permitted and prohibited uses of AI in any work being developed for assessment purposes.

09

Use of AI to assess learner performance. For the time being, due to concerns around reliability, transparency and accountability, PTET institutions, exam boards, and other stakeholders should be cautious about integrating AI into assessment processes. Until and unless these concerns are addressed, automated assessment should only be used in low-stakes formative assessment, not for high-stakes terminal assessment.

10

Implementing AI solutions. When implementing AI solutions, PTET institutions should:

- be transparent with students about when and how AI is being used to support their teaching and learning.
- pay close attention to cybersecurity, including robustly evaluating how AI systems will use and store learner data, and ensuring compliance with legal requirements and best practices.
- put in place robust governance arrangements to sign off and oversee the introduction of AI solutions in their institution, including responsibility for ensuring AI case studies are ethical, responsible, and compliant with legal requirements
- put in place a "concern mechanism" for both staff and students using AI solutions to share any concerns they develop about how the technology is being used. PTET institutions should review any concerns raised and consider whether they require changes to be made to their use of AI.

Introduction

The emergence of Generative AI in late 2022 has seen many organisations, across sectors and across the world, scrambling to identify its implications and work out how they should respond. However, it is important to recognize that Generative AI is just one sub-field of artificial intelligence. Other types of AI, sometimes referred to as 'traditional AI' and making use of techniques such as machine learning and natural language processing, have been available for much longer.

In the PTET sector, AI is both an enabler of scale and improvement, but also a disruptor, with the potential to significantly disrupt institutions' business models and administrative processes. Its emergence and expansion clearly involves great opportunity accompanied by great risks. It is therefore crucial for all those involved in PTET to engage with AI.

But it can be difficult for PTET institutions to navigate this landscape – with a plethora of edtech solutions being marketed (of varying degrees of quality), a gap between some of the claimed benefits of AI and the current capabilities of AI technologies, and a need to effectively manage key risks around data, cybersecurity, privacy and learner safety and wellbeing.

This report is designed to help institutions and other stakeholders to cut through this noise by clearly identifying some of the key trends, opportunities and risks related to AI and PTET that leaders and stakeholders in the sector should be aware of.

In the first section of this report, we look at how AI is currently being used in the PTET sector – and some of the most compelling uses of AI. In the second section, we explore some of the risks associated with the use of AI in PTET – and how these might be mitigated. Finally, we explore the implications of AI for the labour markets and for PTET institutions' own workforces.

This report draws upon a rapid review of relevant research and grey literature, conducted in January 2024, and three consultation workshops, conducted in March 2024, and attended by representatives of WFCP member institutions from countries across Africa, the Middle East, Europe, North America, South America, the Caribbean, Oceania, and Asia. The research is aimed at policy makers and practitioners and adds to the evidence base for PTET at a time of growing demand for skills.

The use of AI in education is progressing at a rapid pace. Whilst, we have continued to scan new research and reports published after the rapid review was undertaken, this report gives a view of the state of the field as it was at the time of research. Please note that mentions of particular solutions in this report should not be interpreted as an endorsement of that solution by WFCP.

What do we mean by AI?

Whilst there is no single accepted definition, Artificial Intelligence (AI) is generally taken to refer to computer systems that have been programmed to perform tasks that usually require human intelligence or cognition. AI systems generally make use of a particular set of analysis techniques, including "machine learning", "logic and knowledge-based approaches" or "statistical approaches" (EC, 2023). "Machine learning" refers to algorithms which are able to learn patterns from data (AI for Education, 2024).

'Generative AI' uses 'large language models' (algorithmic models that have been trained on large amounts of text) to infer or predict sequences of text. The sequences of text produced mimics content produced by humans.

'Predictive AI' which involves making predictions about new datasets based on statistical analysis of historical datasets (Educause, 2023). Whilst a lot of focus since 2022 has been on generative AI, there are also powerful case studies for predictive AI in education.

What do we mean by Professional Technical Education and Training (PTET)?

PTET generally covers post-secondary education across the world. Its focus is on preparing people of all ages to contribute to their local, regional and national economies. Global organisations that deliver PTET are sometimes called community or further education colleges, polytechnics, career and technical education, vocational education programs and higher education programs.

PTET exists to:

- support industry and employers to train new employees and develop existing staff
- support innovation and entrepreneurship, particularly the development of new processes and new businesses
- enable individuals to build their own capability and to support individuals at different points in their journey through the world of work

In order to do all of this, PTET provides high-quality vocational, professional, and technical education and training at a range of levels to develop the competency and capability of individuals throughout their lives (WFCP, 2021).

01 Current usage of AI in the PTET sector

There is relatively little systematic data available on the current use of AI technologies in the PTET sector globally. The majority of published data and research tends to report on the result of experimentation with AI or relatively small-scale implementations.

The UK's education technology agency, Jisc, has developed a maturity model for understanding levels of adoption of AI in the education sector (see Figure 1 below) – and suggests that most tertiary education institutions are in the early stages of AI maturity and adoption.

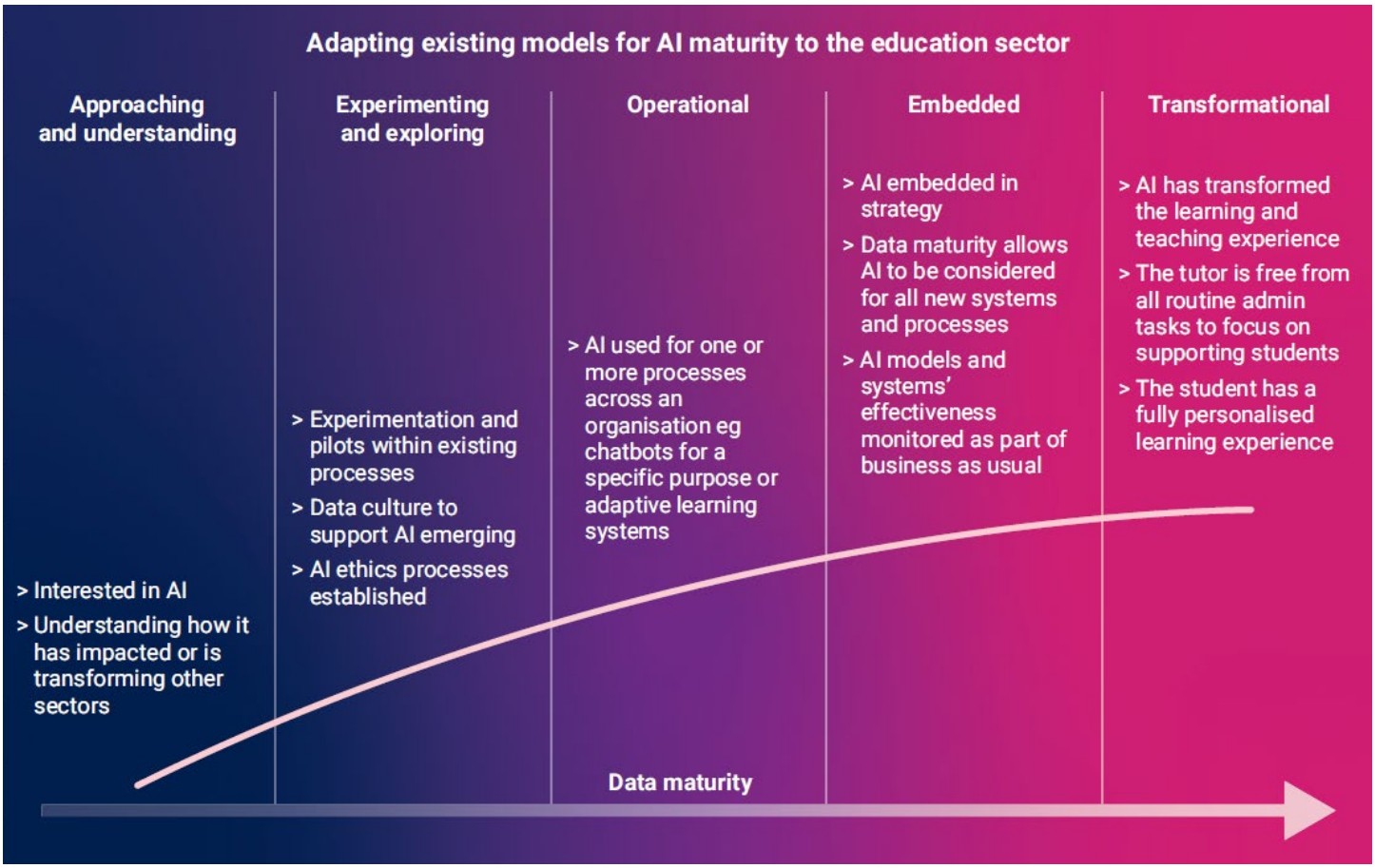
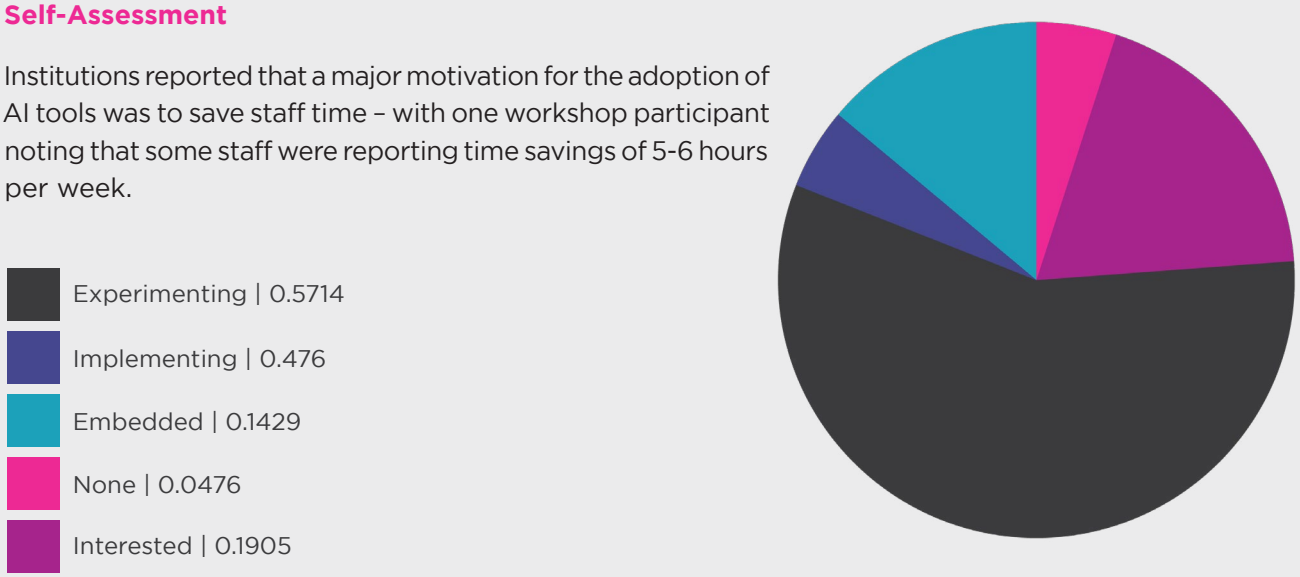


Figure 1: Jisc AI Maturity Model (Source: Jisc, 2023)

Self-assessment by representatives attending the workshops WFCP convened to inform the development of this statement supports this hypothesis. Whilst not representative of the Federation's full membership, over half of the workshop attendees said that their institutions were in the experimenting and exploring stage (see Figure 2). Attendees were also overwhelmingly positive about the prospect of AI in the PTET sector – with 92% describing themselves as positive or very positive about its use. Much of the workshop discussion focused on applications of generative AI, with less emphasis on applications of predictive AI.

Figure 2: Workshop Participants AI Maturity Self-Assessment

Institutions reported that a major motivation for the adoption of AI tools was to save staff time – with one workshop participant noting that some staff were reporting time savings of 5-6 hours per week.



"I truly feel that this would really save time and efficiency, especially in our TVET sector where we are definitely low in our workforce and screaming for more help from every side."

WFCP Member Representative, Oceania

"We've got real issues in England around teacher recruitment and retention and AI has been seen as a bit of a tool in the armoury to try and support teachers, to support their well-being, to reduce some of the workload, and to automate some of the processes and the things that they do all of the time"

WFCP Member Representative, Europe

WFCP Member institutions are taking different approaches to adopting generative AI. In some institutions, staff are using the public web interfaces of general-purpose Large Language Models (LLMs), such as ChatGPT. Others were buying in edtech products powered by LLMs, which largely remove the need for precise prompt engineering by staff, and are linked to pedagogy. Some are exploring building their own platforms – trained on their institution's own content. Others reported that they were looking at how AI could be integrated into their existing technology solutions such as online learning management systems. Meanwhile, students and staff are increasingly able to access AI tools that have been integrated into office software, internet browsers and computer operating systems.

02

Opportunities and case studies for AI in the PTET sector

Generative AI technology is advancing quickly – one institution participating in a WFCP workshop reported they were already on the third version of their AI policy. Even since the public launch of ChatGPT in November 2022, the potential case studies for AI have evolved significantly.

It is crucial for all those involved in PTET to engage with the development of AI – in order to harness its potential to help them tackle challenges faced by learners, staff, or the institution, and to enable them to manage the potential for disruption that AI poses.

AI is an enabler. If harnessed effectively, AI presents significant opportunities to optimise, or even transform, how education and training is delivered, and consequently, to improve students' education and employment outcomes. Jisc (2023) highlights that AI can be used to "increase the capacity" of PTET institutions (through automation of processes, allowing tasks to be done faster or at higher volumes, and as a mechanism for scaling successful provision). It can also be used to "extend the capability" of institutions through the creation of new capabilities, analytics, and insights.

AI is also a disruptor. As an agent of change in how education is delivered, AI also has the potential to significantly disrupt the business models of PTET institutions. For example, the significant reduction in the cost of producing learning content is likely to lead to new organisations beginning to offer professional training to learners. As former university leaders Chris Husbands and Janice Kay (2024) have recently warned, "it is possible that AI dissolves institutional business models and becomes existential for some institutions".

RECOMMENDATION

Challenge-based exploration of AI. All PTET institutions should dedicate some resources to exploring the implications of AI for how they operate. PTET institutions should not adopt AI for its own sake, but instead take a challenge-led approach to exploring case studies for AI – identifying areas where students or staff currently experiencing challenges and considering whether AI solutions could materially help improve performance in that area.

Below, we set out seven areas where there is potential for AI to be used. These case studies are at different stages of experimentation and implementation. Some have already been developed and implemented (in some cases at scale). Others are more speculative. We focus principally on case studies that are specific to education and training.

Like any enterprise, PTET institutions are also likely to have opportunities to use AI to automate elements of administration and business processes. Technology could be used to speed up data wrangling, reporting and compliance tasks, for example, or AI chatbots could be used to answer routine and simple student queries, in a similar way to those used by e-commerce retailers. These are not covered in detail here for reasons of space – but contributors to our workshops thought that these were perhaps "lower hanging fruit" with less risk than some of the education case studies below. There may also be potential for cost savings to be realised through automation, allowing for reinvestment of savings from efficiency savings into teaching, learning and other priorities.



TYPE OF USE CASE	LEARNER FACING CASE STUDIES	TEACHER AND INSTITUTION FACING CASE STUDIES
Generating content	✓ Producing learner-facing digital content - including audio, video and VR content	✓ Producing lesson plans, schemes of work, quiz questions, model answers, and other teaching materials
AI-powered personalised and adaptive learning	✓ Adaptive learning platforms / intelligent tutoring platforms ✓ AI-powered chatbots	
New insights for decision making from machine learning and predictive analytics		✓ Identifying students who have disengaged from their studies or who are at risk of dropping out ✓ Providing new analysis and insights into labour market trends
Supporting learning inclusion through Assistive Technology	✓ AI-powered screen readers for visually impaired learners ✓ Speech to text transcription for hearing impaired learners ✓ Interpretation and translation for learners studying in a second language	
Supporting teachers' development		✓ Teaching analytics, insight and feedback ✓ AI-powered chatbots and teaching simulators to aid professional development
Assessing students' performance		✓ AI-augmented marking for formative assessments (including grading, generating feedback)

Figure 3: Overview of examples of AI in PTET case studies

01

Generating digital content for teachers and learners

Teacher-facing digital content

Staff at many PTET institutions are already using generative AI to develop digital content to support their teaching. Generative AI can be used to generate a wide range of materials including schemes of work, lesson plans, worksheets, slides, quiz questions and student exercises, and model answers.

WFCP members reported that they had used generative AI to adapt learning materials for classes with lower levels of language competency or to come up with quiz questions to be used to check for learner understanding. This was seen to have significant potential to save teachers' time. Members also thought the time-saving could enable more differentiated teaching – given that materials tailored to the needs and abilities of individual students or cohorts could now be produced more quickly.

> "We're using it a lot for learning activities within classes, especially around the check for understanding, coming up with some quick quizzes etc. That is saving teachers a lot of time."
>
> **WFCP Member Representative, Oceania**

There is a risk however that the content generated is incorrect or uses unsound pedagogy, particularly if a generic generative AI tool is used. It is crucial that staff undertake quality assurance on all material produced in this way – and consider materials produced to be drafts that require review.

Improving the outputs of large language models

There are a number of ways to make the data returned by generative AI more accurate.

Prompt Engineering: Users can improve the relevance of the material generated by a large language model by giving it a detailed prompt, covering for example the format that the material should be provided in, and the level of language complexity needed. Some solution providers have developed "front-ends" for large language models, pre-programmed with detailed prompts, that have been refined and tested to remove the need for teachers to develop their own prompts.

Retrieval Augmented Generation (RAG): Retrieval Augmented Generation is a technique that links AI services to repositories of educational content (such as curricula, textbooks, and previous human-produced materials), enhancing the factual accuracy of the content generated.

Fine-tuning: Fine-tuning involves training a large language model on an additional curated dataset, and then adjusting the weights the model uses to give more weight to the content of the secondary dataset. This could be used to, for example, teach the large language model the style in which the material it generates should be produced, or the curriculum approach used in a particular national education and training system.

(Sources: Merrit 2024. Nixon 2023, AI for Education 2024)

Learner-facing digital content

Some institutions are also looking at providing learners with opportunities to learn directly through engaging with AI interfaces. One college, for example, had tried using AI-generated historical figures to help bring concepts to life and stimulate greater levels of learner engagement with content, though it should be noted that some similar tools have reported issues with factual accuracy (Rennolds and Varanasi, 2023).

Another WFCP member representative was enthusiastic about developments in audio AI, which enabled second language learners to converse verbally in the language that they were learning – and receive feedback [1]:

> "We don't typically get access to native speakers of other European languages. AI is a boon to practise conversation... language teachers just trip over themselves by what's possible in this area and are definitely excited to see what comes next."
>
> **WFCP Member Representative, Europe**

More speculatively, there is also potential for AI to turbo-charge the availability and use of augmented reality (AR) and virtual reality (VR) content. Whilst the use of virtual reality in PTET has been a possibility for some time, its uptake has been relatively limited. It is likely that AI will boost the use of AR and VR content, by making high-quality VR/AR simulations easier and more cost-effective to produce, and by enabling developers to produce VR/AR content that is more immersive, engaging and responsive. AI-powered AR/VR applications could allow learners to practice hands-on technical skills – and how to interact with colleagues, customers or other people – with greater realism than has been possible to date (Rock Paper Reality, 2024). Several institutions are already using AI-powered virtual reality in medical training to allow students to practice interacting with patients (Jisc 2023, Educause 2023).

[1] See for example: deepgram.com/ai-apps/speak-com

02

AI-powered personalised and adaptive learning

One of the most significant areas where it is claimed AI could be beneficial is in supporting greater personalisation of learning. Some previous studies have concluded that using technology to deliver personalised learning opportunities has promise as a mechanism for improving learning outcomes (e.g. Major et al, 2021).

AI-powered personalised learning systems can take several forms. **Adaptive learning systems** (also sometimes known as 'intelligent tutoring systems') are learning systems that use algorithms to adapt the content that is served to a learner based on their performance in tests and quizzes. This personalisation can include changing the route that learners take through content (for example, skipping basic material if learner demonstrates strong pre-existing understanding), content recommendation (recommending that students do particular activities on the platform, or recap particular sections of content, in order to improve their understanding) or changing the level of difficulty of assessment questions (Jisc 2023).

Platforms are often also able to provide insight to teaching staff on learner performance. This can be used to inform the focus of classroom time, to enable differentiated teaching, or to alert staff to instances where intervention may be required: for example, if a learner is disengaged or persistently struggling with particular content.

Several organisations have also developed AI-powered chatbots which can be used to answer learner questions and provide guidance and support in working through questions and answers. Using a chatbot may mean that learners can be offered more individualised support than would otherwise be possible through traditional modes of delivery – and allows support to be delivered out-of-hours, when teaching staff would otherwise not be available. Some experts have however criticised leading examples of AI-powered chatbots for lack of sophistication in the guidance they are able to offer to learners.

Several WFCP members were expecting to see the integration of **AI technologies** into online learning systems translate into greater engagement and interest from learners, particularly if 'nudge' and behavioural science-inspired interventions were deployed. Phone notifications, personalized content suggestions, gamification of learning, and formative assessment exercises are all expected to increase learner interest and improve learning outcomes. Another contributor, from a WFCP member institution in North America was keen to "find ways to use AI to help provide additional resources to students, especially those students that are often marginalised or 'invisible' students."

Members were also enthusiastic about the opportunities for out-of-hours, flexible learning that technology provides:

"We have a 24/7 accessible system, where students can access the material anywhere, anytime, at a convenient time."

WFCP Member Representative, Africa

"The main issue around self-directed learning is that accessing support from a college or a tutor or a lecturer can often take time. Often learners need to have a response at the point where they run into a problem and we're seeing examples of where trials with AI support tutors are providing those answers equally"

WFCP Member Representative, Europe

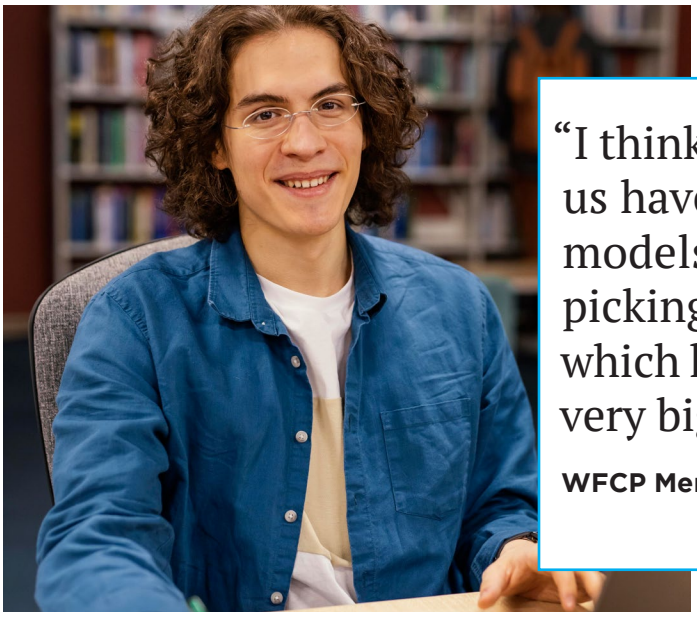
03

Providing new insights for decision making

Machine learning techniques can be used to analyse large datasets in order to inform institutional decision-making. These techniques allow for the analysis of far larger amounts of data than humans would be able to process, and allow for the identification of unexpected and non-obvious patterns (Pouliakas, 2021).

Potential applications of this for PTET institutions include:

- Identifying students who have disengaged from their studies or who are at risk of dropping out through analysis of attendance data, assessment results, and student interaction with any digital learning systems the institution has. This allows teaching staff to follow up, and where necessary provide additional support and motivation, improving student retention and performance
- This kind of analysis could also be used to identify disparities in learner outcomes among students from different demographic groups. Institutions could use these insights to help address barriers faced by less advantaged learners, or to put in place targeted interventions such as mentoring or tutoring (Humphries and Goodwin, 2023).
- Providing new insights into trends in the labour market and demand for particular types of skills through mining the text of published job descriptions. In Chile, for example, the National Training and Employment Service (SENCE, for its acronym in Spanish) has developed the Sistema de Análisis de Bolsas de Empleo (Employment Database Analysis System). This system uses artificial intelligence techniques, namely text mining and machine learning, to analyze data from online job postings and identify labor market trends The detailed insights the system provides into in-demand skills are used to guide curriculum development and training efforts to help meet labor market needs effectively. (SENCE, no date; SABE, no date). This data could also be compiled into formats that provide learners with insights on likely labour market outcome, helping them to make more informed choices about future careers. It is crucial however to remember that not all jobs are advertised online (particularly in countries with significant informal economies), and such analysis therefore only provides a partial few of what is happening in the labour market (Pouliakas, 2021).



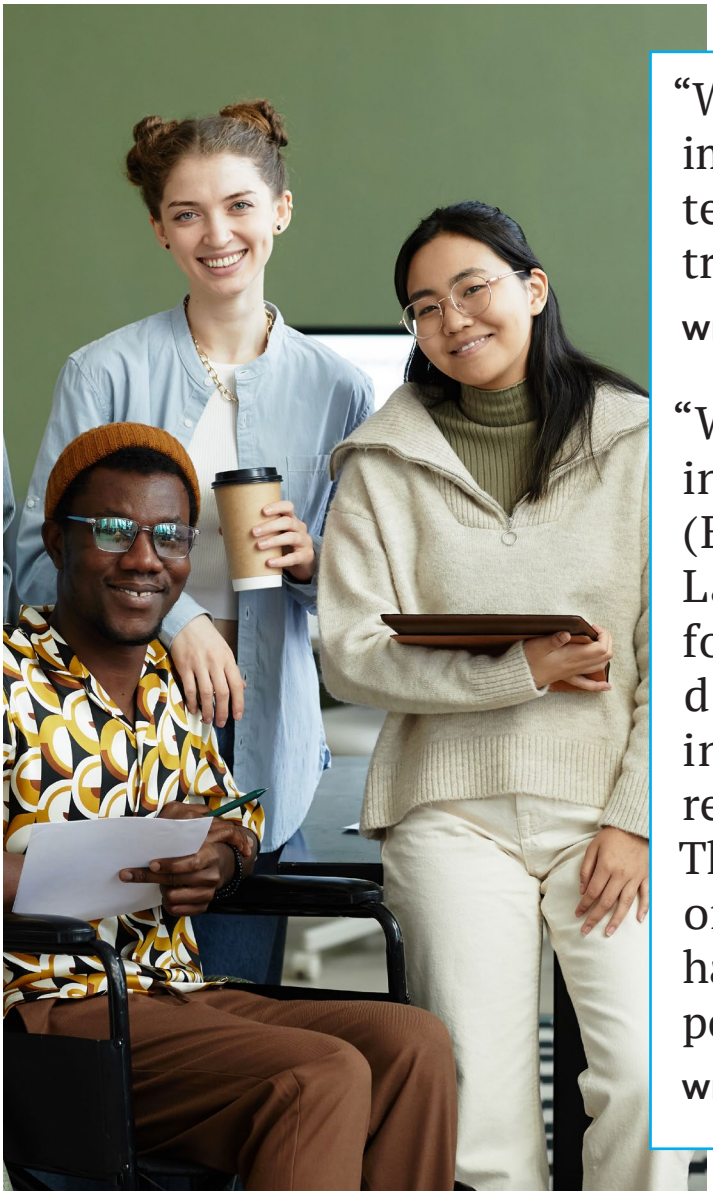
> “I think probably AI is going to help us have more and better predictive models on student retention, also picking up on mental health issues, which has post-pandemic been very, very big for us.”
>
> **WFCP Member Representative, South America**

04

Supporting learning inclusion through Assistive Technology

There is significant potential for AI to help improve the accessibility of PTET through powering improved assistive technologies. For visually impaired learners, AI-powered screen reader technology can convert text to audio. For hearing-impaired learners, transcription technologies can convert speech into text, with increasing levels of accuracy. Integration of machine learning into these solutions could enable greater personalisation – with algorithms learning the needs, preferences and usage patterns of the learner (UCL STEAPP, 2020). There is also strong potential for AI tools to be used to power interpretation and translation for learners who are not native speakers of the language of instruction, which is likely to lead to higher levels of comprehension and understanding among these learners.

Several WFCP members reported they were already using, or exploring the potential of these technologies to improve access.



"We are working to see whether we can improvise text to speech or speech to text and also an element of language translation"

WFCP Member Representative, Africa

"We're already seeing some really interesting use of it around ESOL (English for Speakers of Other Languages) learners... using it for interpreting induction videos, documents, resources, virtual interpreters in a classroom are relaying messages in their language... That can be really exciting in terms of supporting those students who have got additional needs, with some personalised learning support."

WFCP Member Representative, Europe

05

Supporting teachers and their professional development

One of the most promising areas in which AI in education could make a difference is around supporting teacher development and day-to-day teaching practice.

Potential case studies include:

- **Teaching analytics and insight.** AI systems could be used to provide teachers with insights on how they can improve their practice using analysis of classroom performance and student assessments (Holmes, 2023b, Felix and Webb, 2024). Given that institutions have only limited time and resources for lesson observation and peer coaching, this would allow far more feedback and coaching support to be given, particularly for newer teachers. This is an emerging use case, with current solutions able to analyse and measure the amount of classroom time taken up by a teacher speaking and by individual students speaking. Whilst this has potential, the machine learning algorithm would need significant training in order to be able to provide reliable insight and feedback. Some stakeholders, notably teaching unions, have also expressed concerns that such solutions could be used in disproportionate and inappropriate ways as a method of teacher surveillance and performance management. Learners themselves may also have some concerns about being monitored in this way.
- **AI-powered teacher professional development.** There are several promising applications of AI technologies related to teacher development, notably the development of classroom situation simulators. For example, the Teacher Development Trust has developed 'Teacherverse' a generative AI tool that allows teachers to work through immersive simulated classroom scenarios to develop their classroom skills – and receive advice and feedback from a virtual mentor on their responses [2]. There are also examples of Chatbots being used to coach teachers in low-income contexts.

Institutions should take care however to ensure that adoption of AI technologies does not lead to teaching staff becoming de-skilled or de-professionalised. Several experts and organisations have highlighted this as a risk. Felix and Webb (2024) note that "over-reliance on AI for lesson planning or marking risks de-skilling teachers" – and warn that this could lead to teaching being less rather than more personalised. The AI for Education initiative highlights that "the thinking involved in [a teacher] doing a task is helpful to their practice", citing the example of the process of lesson planning being used by teachers to think through how they will teach concepts. The innovation agency Nesta (Stupple-Harris et al, 2023) highlights emerging evidence from the human resources and professional services industries that professionals using AI can "fall asleep at the wheel" – negatively impacting performance, productivity and skill development.

[2] tdtrust.org/teacherverse-ai/

06

Assessing student performance

There is significant interest in finding ways to use AI systems to grade student work. Typically, AI solutions in this space use machine learning and natural language processing to learn from an initial set of answers that has been marked by a human marker, or from model answers. The AI system then either automatically grades the remaining answers, or recommends to the marker that the same feedback be given to students who have written similar content. This offers opportunities to reduce marking times for teachers, and to personalise feedback for learners to a greater extent than would otherwise be possible. Feedback can be provided more quickly, and the reduced time required for marking could allow for learners to be given more opportunities for formative assessment, or allow teachers to focus on other tasks.

However, there are also significant risks associated with automation of assessment. Firstly, there are concerns about reliability, notably including the challenges that systems face when presented with original or innovative answers that have not been anticipated by the teacher when the assessment was set (Hahn et al, 2021). PTET leaders and policymakers need to make a judgement, on what level of reliability is acceptable for different types of assessment. A higher level of reliability would be required for high-stakes terminal examinations, for example, than for low-stakes formative assessments.

Secondly, there are challenges around accountability and explainability. In high-stakes assessments, examiners can be asked to explain why an exam paper has been given a particular grade, and exam papers can be subjected to review and remark by a more senior examiner. It is unclear how this would be done with a large language model-based marking system (Hills and Henkel, 2023-24), although it would be possible to create an explainable AI marking system using other AI techniques.

A further risk is bias. On the one hand, AI can make marking more consistent, and eliminate human bias by ensuring that similar assignments are given similar marks. On the other hand, there is a risk that AI-powered marking will replicate biases contained within its training data. Finally, there is also a risk that the use of automated marking may lead to greater gaming of the assessment system, with learners and teachers identifying the factors that the algorithm puts greater weight on – potentially leading to more 'teaching to the test' and a narrowing of the curriculum.

RECOMMENDATION

Use of AI to assess learner performance. For the time being, due to concerns around reliability, transparency and accountability, PTET institutions, exam boards, and other stakeholders should be cautious about integrating AI into assessment processes. Until and unless these concerns are addressed, automated assessment should only be used in low-stakes formative assessment, not for high-stakes terminal assessment.

03 Managing the risks associated with AI in PTET

There are however significant risks surrounding the development and use of AI in PTET that institutions and other stakeholders will need to carefully manage.

01

Use of AI could deepen the digital divide

A significant proportion of the global population does not have sufficient access to the digital infrastructure required to benefit from applications of AI. Internet access remains a major issue. In 2022, one-third of the world's population still did not have access to the internet, including 3 in 4 people living in low-income countries. In some low-income countries internet speed has actually fallen (World Bank, 2024). Prospective users of AI solutions in low-income countries also face other resource barriers – including limited access to the devices and hardware required, and difficulty in meeting the cost of subscriptions to large language models (AI for Education, 2023).

There are also concerns about the capacity available in education systems in low-and-middle-income countries given a need to manage more immediate pressing concerns (Shiohira and Keevy, 2020). WFCP members reported challenges in finding the financial resources and technical expertise required to support them in implementing AI solutions within their institutions.

> "The challenge that we have, especially in Kenya, is the infrastructure to be able to have this, you need resources, you need expertise, you need trainings to be done."
>
> **WFCP Member Representative, Africa**

The combination of these factors creates a risk that only better-resourced countries will be able to properly harness the benefits of using AI in education, which could amplify and exacerbate existing inequalities in access to quality education. This strengthens the case for governments to invest in improving digital infrastructure – and suggests that governments and development agencies should accelerate their plans for the improvement of digital infrastructure so that communities that do not currently have sufficient access can benefit from applications of AI

Development of AI solutions should also include solutions that do not require constant internet access or high levels of device ownership – so that the benefits of AI are not confined to high-income communities, countries and groups. This could include developing mobile-first solutions aimed at teachers (who are more likely to have access to devices and connectivity) rather than learners, or building applications that can used in data-light or offline mode on less advanced devices. A good example of this would be the development of a solution that enabled teachers with only occasional internet access to generate and download AI-generated lesson plans or audio content that could be used to aid their teaching at a later date (AI for Education, 2023). Another example, recently highlighted by the Centre for Global Development (Chia, 2024) is the piloting of an AI-powered voice assistant to allow users of basic feature phones in areas without internet access to ask questions and get answers.

A different "digital divide" risk exists for disadvantaged groups within all countries, in that the costs of subscriptions to multiple AI tools could disadvantage learners from lower-income backgrounds if they are unable to afford the tools that are being used by their more affluent peers.

RECOMMENDATION

Digital infrastructure. Development of AI should include solutions that do not require constant internet access or high levels of device ownership – so that the benefits of AI are not confined to high-income communities, countries and groups. Governments, development agencies and the private sector should look to accelerate initiatives to improve digital infrastructure so that communities that do not currently have sufficient access can benefit from applications of AI

02

Outputs from AI systems may not be reliable

The content or insights generated by AI systems cannot be taken at face value, so it is crucial that users have a critical awareness of some of the limitations inherent in using AI tools.

Quality and accuracy of outputs

There is a risk that the content produced using large language models is factually incorrect, given that the LLM doesn't actually understand the content it produces, but rather generates it based on statistical probability (Felix and Webb, 2024). Generative AI regularly produces "hallucinations", i.e. content that is entirely made-up. Teaching staff should therefore only use generative AI for generating content for use in lessons, where they are sufficiently familiar with the content to be able to quality assure the outputs.

With predictive AI, the accuracy of algorithmic outputs is linked to an institution's ability to feed accurate input information into the model. For some potential case studies of predictive AI, this poses some difficulties – for example, classroom analytics requires learner performance to be "observable" (Hillman, 2024). This requires hardware to collect data on student performance and understanding (which understandably creates unease and introduces risks) as well as sufficient sophistication in the software to be able to observe complex classroom environments. Data input has also been a pain point with previous implementations of machine learning technologies: integrating data from other systems such as virtual learning environments has often been an expensive and challenging element of implementing learning analytics systems.

Cultural hegemony and algorithmic bias

The training data that large language models have been trained on is largely scraped from the internet. This means that content from the Global North where the training data primarily emanates from is over-represented – and that users from the Global South may find that the examples or cultural reference points generated by the LLM may not be as relevant to them and their learners (UNESCO, 2023).

For non-English speakers, there are additional concerns, with current generative AI tools performing better in English, and insufficient training data available for less used languages (Butler et al, 2023). This was highlighted by one of WFCP's members from South America, who noted that they had used platforms in both Spanish and English and observed that "if you put prompts in different languages, your result is completely different... so how are you going to discern, what's real, what isn't?".

To counteract these risks, it is necessary to look at how AI applications can be adapted to make them more relevant to different national cultures, and different education system requirements. In the context of South Africa, for example, McNulty (2024) has argued that the practical implications of this might include ensuring that student-facing services can engage with learners in their mother tongue (using large language models that have been trained on African languages), and training solutions on the national curriculum and on the pedagogical approaches that should be used. Meanwhile, the Nigerian government, has announced plans to develop a multi-lingual LLM which will be trained in five indigenous languages and accented English to improve language representation in the datasets being used for AI solutions in Nigeria (Ajibade, 2024).

A related issue is the risk that the LLMs amplify problematic societal biases contained within the training data – such as generating content that reinforces traditional gender roles and occupational segregation. Algorithmic bias is not just an issue with large language models – it is also a particularly acute risk using predictive analytics with more traditional AI techniques', where left unchecked, algorithms could automate differential treatment of learners based on historical patterns it identifies in datasets. In England, for example, an algorithm used to moderate assessment results during the COVID-19 pandemic was found to have reinforced inequalities which existed within the country's education system (USAID, 2023) leading to a number of "anomalous and discriminatory" results that the government was eventually forced to reverse (Freedman, 2021). In the United States, Georgia Tech

University has faced criticism for partially automating its graduate admissions process through the use of a machine learning system trained on past admissions data that predicts how likely it is that the admissions committee will admit each new applicant (Burke, 2020).

Pedagogical soundness

There is also a risk that material that content generated by teachers and learners is not pedagogically sound. Whilst it is possible to train AI solutions on pedagogy to mitigate much of this risk, through for example, the use of prompt engineering, there is a risk that AI embeds approaches that are not grounded in appropriate pedagogy – and that AI simply "scales up and automates bad pedagogical practices" (Attwell et al, 2020) or "embeds primitive approaches to pedagogy" (Holmes 2023b). The British Council's (2023) work on the use of AI in English Language Teaching has highlighted the pedagogy used in AI solutions as an area for further exploration – raising a question about whether new pedagogies will be developed around the use of AI (potentially creating new opportunities for learning), or whether AI for Education will simply be designed around existing pedagogies.

Lack of transparency, explainability, auditability

These challenges are all compounded by the "black box" nature of many AI systems, which means that it is often not clear why AI systems have generated particular insights. This has important implications for potential case studies where explainability, transparency and auditability are important, such as high-stakes assessment or to support decision-making around admissions to courses. One WFCP member, from Europe, reported that "faculty and staff have expressed some concerns around the lack of transparency" and was keen to see a greater focus on "explainable AI". There may be trade-offs to be made between transparency and accuracy of AI solutions: Holmes et al (2021) has previously reported on one expert's view that a less accurate system that was transparent would be preferable to a more accurate but less transparent system.

Developing critical AI literacy

The risk that generative AI systems serve teachers and learners with inaccurate information means that it is vital that both teachers and learners develop information literacy skills and are able to assess the credibility of material produced using generative AI. UNESCO (2023:26) advocates for governments to develop AI curricula that cover "the impact of AI on our lives… the ethical issues it raises… age-appropriate understanding of algorithms and data, and skills for the proper and creative use of AI tools including GenAI". WFCP will play its part in supporting the development of AI literacy in the PTET sector through sharing best practice via its networks and events, and through the creation of new communities of practice.

> "There also has to be intelligence on how to use it and how to see what information is real, how to double check it and not just rely 100% on the platform."
>
> **WFCP Member Representative, South America Lack of transparency, explainability, auditability**

RECOMMENDATION

AI literacy. PTET institutions should develop AI literacy modules that provide learners with an understanding of the limitations of AI, and the knowledge and skills necessary to be able to critically assess the credibility of material produced using generative AI.

03

Learner safety and cyber-security risks

As with any solution that collects, accesses or stores learner data, there are substantial cybersecurity risks associated with the use of AI tools, with a risk that malignant actors will be able to obtain personal data. This is particularly a risk for predictive AI tools that may need to access data on learners' performance and characteristics. Risks including 'data poisoning', where Generative AI models are manipulated to influence the outputs they produce, or 'direct prompt injections', designed to expose sensitive data (Wiz, 2023). There is a need for robust cybersecurity protections and controls for any learner data stored within AI systems. Staff and students should also be made aware of the risks of entering personal data and information into AI tools.

RECOMMENDATION

Implementing AI solutions Cybersecurity. PTET institutions should pay close attention to cybersecurity, including robustly evaluating how AI systems will use and store learner data – ensuring compliance with legal requirements and best practices.

04

Uncertain legal framework for the use of AI technologies

The speed at which consumers and enterprises have started to use generative AI has left governments and regulators scrambling to review the adequacy of current legal frameworks to govern their use. Most significantly, there is considerable debate internationally on whether the use of copyrighted content to train large language models should be considered "fair use" or whether it is a breach of intellectual property laws. In the United States, for example, this is due to be tested in the courts in a legal case that the New York Times has brought against Open AI and Microsoft. In other areas, institutions deploying AI solutions will need to do proper legal due diligence to ensure that they comply with existing regulatory requirements – paying particular attention to laws on privacy and data protection. National legal frameworks underpinning the use of AI may also evolve – for example, the European Union has recently passed the EU AI Act which bans the use of emotion recognition in education institutions (which it deems to involve unacceptable risk) and places new obligations on suppliers of AI systems deemed to be high risk, and suppliers of general-purpose AI models (European Commission, 2023).

[3]See for example https://blogs.worldbank.org/en/education/worst-practice

05

Limited robust evidence that the use of AI in education will lead to better outcomes

Limited robust evidence that the use of AI in education will lead to better outcomes. At this point in time, there is limited robust evidence that the use of AI improves educational outcomes for learners. To some extent, this is to be expected given that the use of the latest generation of AI is still relatively nascent and much activity is still in the experimentation stage. Lessons must be learned however from previous unsuccessful large-scale attempts at implementing education technologies [3]. AI solutions should be piloted and should meet reasonable standards of evidence before they are implemented at scale.

06

Potential negative long-run impacts on learning and social interaction

Several experts have expressed concern that reliance on AI could result in a narrowing of the competencies developed by learners. If learners are able to turn to AI solutions as a first resort there is a risk that they will not develop key competencies such as critical thinking, reasoning, creativity and writing to the extent they do currently (Jisc, 2023; Felix and Webb, 2024).

Indeed, this risk is acknowledged by Microsoft, itself a major supplier of AI models, in its 2023 New World of Work Report (Bulter et al, 2023). It highlights that academic research suggests that "an increase in automation can result in deterioration of cognitive skills that are crucial when automation fails, and human needs to take control" and that "automation also limits opportunities to develop problem-solving skills needed to critically evaluate the output of the system".

Some of these competencies (critical thinking and creativity) are among the transversal and cognitive competencies that learners are likely to need to navigate churn in the labour market and adapt to new roles and occupations as AI adoption occurs. Webb (2024) reports that students are also concerned about this and wonder "what are they losing through not doing the work the traditional way".

Other experts have expressed concern that the use of AI in learning could lead to a reduction of opportunities for learners to have social interaction, for example with other learners or with teaching staff (Holmes, 2023b). This is less of a concern where technologies are being used to supplement face-to-face delivery, rather than replace it.

Conversely, some WFCP members thought that there was potential for AI to actually increase opportunities for human interaction with and among learners through automation of lower-value administrative tasks that currently take up teaching staff time.

[3]See for example https://blogs.worldbank.org/en/education/worst-practice

"It goes to efficiency, where it can help us and free us up a lot to do a lot of the things that might take us a lot of time. We can then go and focus on other things that allow us, as humans, to connect to other humans."

WFCP Member Representative, Oceania

"Automating some of the processes and the things that they do all of the time [would] allow them [teachers] to focus on those relationships with the young people who they're teaching."

WFCP Member Representative, Europe

RECOMMENDATION

Intentionality. PTET institutions should be intentional about what they choose to automate using AI tools. There may be some functions that, on balance, institutions choose to continue to do using people rather than technology. This could include, for example, case studies, where institutions determine it is preferable to maintain human interaction, or case studies that are considered to be particularly high risk or sensitive.

07

Academic integrity and plagiarism

The impact of generative AI on assessment process was also a major area of concern for staff from WFCP member institutions participating in our workshops. AI is also undermining some forms of assessment currently used in PTET institutions in that it is possible for learners to use generative AI to produce essays without actually understanding the concepts – though WFCP members thought that PTET may be less exposed to gaming of assessments than more academic fields, as assessments are more likely to already include practical assessment of competencies.

Institutions participating in our workshops had generally acted fast to update their requirements and guidelines around academic integrity, with several institutions now looking at how their models of assessment may need to change in light of AI. Several institutions were considering shifting away from traditional forms of assessment such as coursework. At Hong Kong Metropolitan University, an assessment review, undertaken in 2023, has already resulted in a reduction in the amount of essay-based assessment. In Australia, it was reported that the regulator has asked institutions to do an assessment audit and to move towards a more applied practical type of assessment".

The use of AI in assessment is also a concern for learners – with practitioners reporting that learners are concerned about ambiguity in guidelines, simultaneously wanting to ensure that they don't inadvertently break the rules and that their classmates are not able to get an unfair advantage (Webb 2024).

Institutional guidelines should be clear on what use of generative AI is and is not acceptable in completing assessments, and how learners should declare any use of AI.

> "In some assessments, where it is permitted… they're asked to include the prompt that they put in because we're coaching students on how to develop that knowledge"
>
> **WFCP Member Representative, Oceania**

Whilst tools have been developed to help detect the use of AI-generated content, some WFCP members were not confident that these tools were mature enough to be able to accurately detect the use of AI materials in assessments.

RECOMMENDATION

Protecting the integrity of assessments. PTET institutions should review the approach they take to assessment of student performance – and look at changes which may be required to protect the integrity of assessments. Learners should be issued with clear guidance on permitted and prohibited uses of AI in any work being developed for assessment purposes.

04 Towards a practical ethical framework for AI in education

It is essential that PTET institutions have assurance and confidence that the way they deploy AI products with learners is ethical. USAID's (2023) Artificial Intelligence Ethics Guide recommends that detailed sector-specific guidelines are developed to provide relevant guidance for how AI should be used ethically in particular sectors arguing that simply "expecting actors in sectors like healthcare, e-commerce, and education to simply adhere to common principles of fairness and justice when using AI will generally not be a sufficient approach".

A number of different frameworks for ethical AI in education have been developed, such as those developed by the European Commission, the Institute for Ethical AI in Education and the Australian government (see Box below for more details). These frameworks generally cover similar areas, though differ slightly in how the proposed requirements are phrased and formulated.

Nguyen et al (2023) synthesise frameworks and guidelines produced by UNESCO, OECD, the European Commission and the European Parliament in an attempt to explore whether there is global consensus on the ethical use of AI in education. They identify 7 'General Principles' that should be included in a framework for ethical AI in education – covering governance and stewardship, transparency and accountability, sustainability and proportionality, privacy, security and safety, inclusiveness and human-centred AI. But as the British Council (2023) have pointed out, the challenge with developing ethical frameworks is not their formulation, but "ensuring take-up, that the principles are signed up to and then adhered to and 'that the process is not "owned" by one company, country or culture'".

It would be beneficial for education and training systems to develop standards for AI solution suppliers on what ethical use of AI in education requires, and, crucially what this means in practice. Standards could be used in several ways. They could be useful mechanisms for market shaping, with educational institutions integrating them into the procurement and contracting processes they use to purchase AI solutions, or as a basis for dialogue with potential suppliers. A different approach would be education systems using them to establish kitemarking schemes, which allow for suppliers to be audited and then accredited against standards, providing educational institutions, learners and other stakeholders with greater confidence and assurance that the AI solutions being used are appropriate and ethical. Development of standards could be led by governments, or by education sector organisations in each country, and will also need to include close engagement with the technology industry. It will also be crucial to ensure that the standards developed are adaptable to the future evolution of AI solutions.

Examples of ethical frameworks for the use of AI in education

The European Commission's "Ethical guidelines on the use of artificial intelligence (AI) and data in teaching and learning for Educators" proposes the following requirements for ethical AI in education – and sets out a series of questions for each requirement that educators could use to support dialogue with systems providers and other stakeholders.

Human agency and oversight
Including fundamental rights, children's rights, human agency, and human oversight.

Transparency
including traceability, explainability and communication.

Diversity, non-discrimination, & fairness
Including accessibility, universal design, the avoidance of unfair bias, and stakeholder participation.

Societal & environmental well-being
Including sustainability and environmental friendliness, social impact, society, and democracy.

Privacy and data governance
Including respect for privacy, quality and integrity of data, and access to data.

Technical robustness and safety
Including resilience to attack, security and general safety, accuracy, reliability, and reproducibility.

Accountability
Includes auditability, minimisation and reporting of negative impact, trade-offs, and redress.

The Institute for Ethical AI in Education's "Ethical Framework for AI in Education" was developed by a research centre at the University of Buckingham (UK) in close collaboration with industry partners. It sets out the following objectives for ethical AI – and suggests how these could be implemented and operationalised through procurement processes and through monitoring and evaluation activity.

Achieving Educational Goals: AI should be used to achieve well-defined educational goals based on strong societal, educational or scientific evidence that this is for the benefit of the learner

Forms of Assessment. AI should be used to assess and recognise a broader range of learners' talents.

Administration and Workload. AI should increase the capacity of organisations whilst respecting human relationships.

Equity. AI systems should be used in ways that promote equity between different groups of learners and not in ways that discriminate against any group of learners.

Autonomy. AI systems should be used to increase the level of control that learners have over their learning and development.

Privacy. A balance should be struck between privacy and the legitimate use of data for achieving well-defined and desirable educational goals.

Transparency and Accountability. Humans are ultimately responsible for educational outcomes and should therefore have an appropriate level of oversight of how AI systems operate.

Informed Participation. Learners, educators and other relevant practitioners should have a reasonable understanding of AI and its implications.

Ethical Design. AI resources should be designed by people who understand the impacts these resources will have.

The "Australian Framework for Generative Artificial Intelligence (AI) in Schools", developed by the Australian Government's Department for Education covers similar ground – identifying 6 principles (excerpted below) and 25 'Guiding Statements'. The Department plans to review the framework every six months to keep up with changes in the technology.

Teaching and Learning: Generative AI tools are used to support and enhance teaching and learning.

Human and Social Wellbeing: Generative AI tools are used to benefit all members of the school community.

Transparency: School communities understand how generative AI tools work, how they can be used, and when and how these tools are impacting them.

Fairness: Generative AI tools are used in ways that are accessible, fair, and respectful.

Accountability: Generative AI tools are used in ways that are open to challenge and retain human agency and accountability for decisions.

Privacy, Security and Safety: Students and others using generative AI tools have their privacy and data protected

At an institutional level, ethics must be hardwired into the processes through which AI technologies are implemented. PTET institutions should put in place robust governance arrangements to provide oversight of the selection and implementation of AI solutions. This should include ensuring that any uses of AI are consistent with the institution's mission, ensuring that risks have been appropriately mitigated, and ensuring that the AI solutions selected are ethical, responsible, and compliant with requirements set out in legislation and regulation. The UK edtech agency, Jisc (2021), has suggested a series of practical questions that institutions should work through before beginning an AI project. Institutions should also be transparent with students and staff about when and how AI is being used to support their teaching and learning

Teaching staff may however have legitimate concerns about aspects of AI technologies, such as data protection, the potential for misuse of the technology, and the potential displacement of their own role. Institutions should put in place a "concern mechanism" for both staff and students using AI solutions to share any concerns they develop about how the technology is being used – and take any concerns raised seriously.

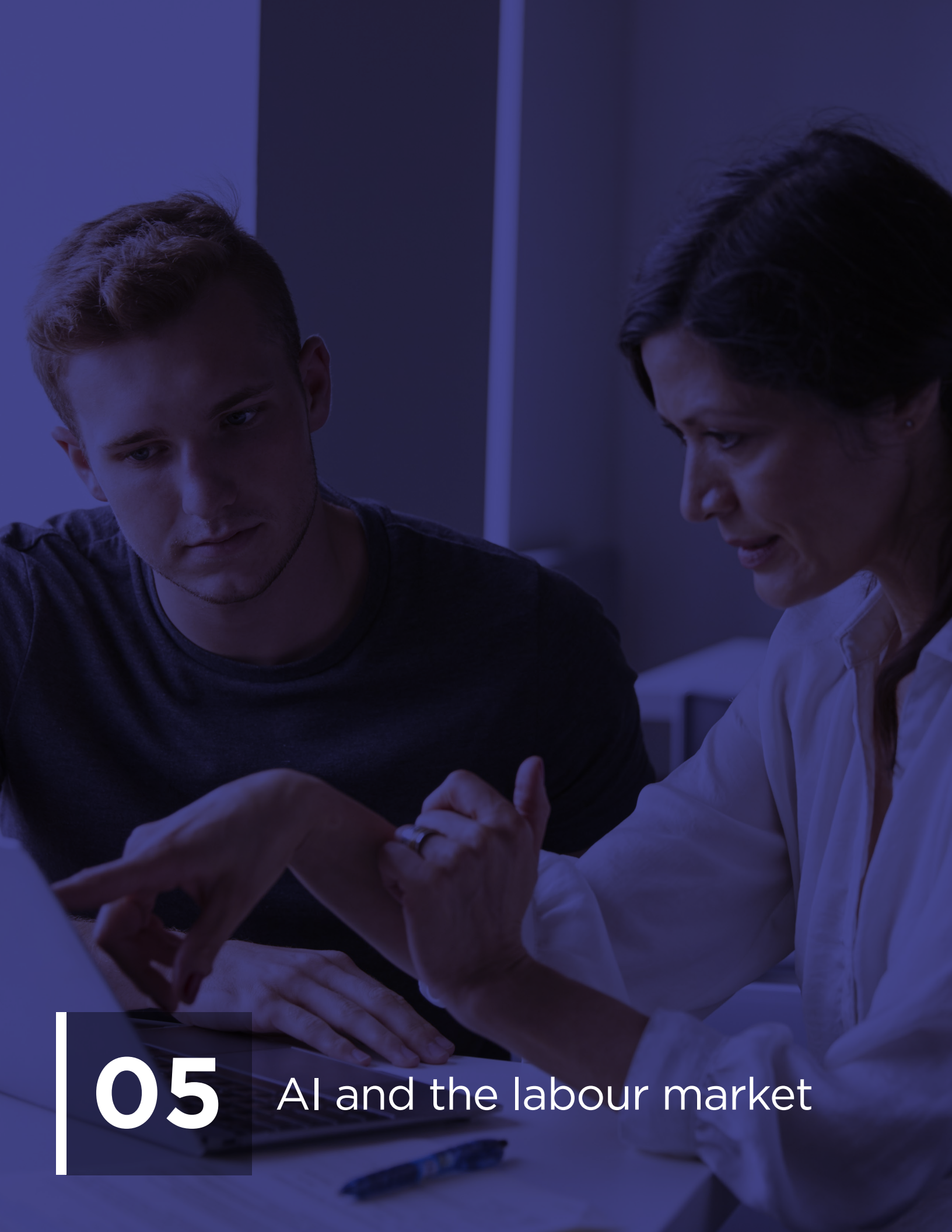
> "We've got to have safe spaces for questions to be asked... for those in strategic roles, those in national leadership roles, but also for the teacher in the classroom that's using it."
>
> **WFCP Member Representative, Europe**

RECOMMENDATION

Implementing AI solutions transparency. PTET institutions should be transparent with students and staff about when and how AI is being used to support their teaching and learning.

Implementing AI solutions concern mechanism. PTET institutions should put in place a "concern mechanism" for both staff and students using AI solutions to share any concerns they develop about how the technology is being used. PTET institutions should review any concerns raised and consider whether they require changes to be made to their use of AI.

Implementing AI solutions governance and ethics. PTET institutions should put in place robust governance arrangements to sign off and oversee the introduction of AI solutions in their institution, including responsibility for ensuring AI case studies are ethical, responsible, and compliant with regulatory and legal requirements.



05 AI and the labour market

AI is also expected to drive substantial change in labour markets – with the adoption of AI technologies leading to change in occupations. The take-up of AI technologies by employers will be determined by a range of factors. These include technical factors such as the reliability and capability of the technology, as well as cultural factors, around, for example, the social acceptability of automation.

Changes are likely to include:

Job replacement/loss: AI taking on occupations previously done by humans

Job augmentation: The content of occupations changing, requiring humans to work with AI tools and technologies in order to perform their jobs

Job creation: New occupations created – for example, related to the development and maintenance of AI systems. These jobs are however likely to require more advanced skills than the jobs lost (Shiohira, 2021)

The International Monetary Fund (Cazzinga et al, 2024) projects that circa 40% of global employment is exposed to AI (ranging from 60% in high-income economies to 26% in low-income countries). It projects that labour market impacts will be mixed, with new labour market demand in sectors where human oversight of AI is needed, and significant job displacement in other sectors. The report's recommendations for governments include providing safety nets and retraining for workers whose roles are at risk of being displaced, particularly for older workers who may face additional challenges in securing alternative employment. It also recommends that low- and middle-income countries focus on developing digital infrastructure and digital skills in order to be in a position to benefit from AI technologies.

The International Labour Organisation (Gmyrek et al, 2023), estimates that 75 million jobs (constituting 2.3% of world employment) have the potential to be automated and lost, with a further 427 million jobs (13% of world employment) having the potential to be augmented by AI. It is uncertain about a further 299 million jobs, which could fit into either category. They recommend that countries support redeployment, retraining and social protection for at-risk workers, focusing on the most exposed sectors, as well as supporting the development of the digital skills that workers will need for AI-augmented jobs.

These changes in the labour market will impact the types of skills likely to be in demand. This will require an updating of the curriculums being delivered in PTET institutions. In our workshops, one WFCP member observed that it would be important to "align what what young people are doing and learning in colleges to the skills that they're going to require in the future", but noted that lots of businesses were unable to project what skills for AI they expected to need. Another member highlighted the risk of offering AI curricula that were too narrow, and risked being made obsolete by future developments in AI technology.

> "With the emergence of generative AI, there was an initial move towards the idea that we should all learn to become prompt engineers. Yet it seems like the direction of travel is that generative AI will become embedded into tools and the technology will gradually become invisible to us. I think we have to be cautious about leaping into the idea that we want to make everyone a prompt engineer, for example."
>
> **WFCP Member Representative, Europe**

Workers who are working with AI applications are likely to need cognitive skills (such as problem-solving, and critical thinking), transversal skills (such as creativity, communication and teamwork) as well as digital skills, and at least a basic understanding of AI (OECD, 2023). Cognitive and transversal skills are also likely to be valuable in boosting the adaptability of learners – helping them to be able to navigate changes in the labour market in the years ahead. Such skills are also likely to be of enduring value, providing learners with a foundation for lifelong learning rather than a detailed understanding of one particular technology.

PTET institutions may need to respond to demand from employers, and develop specialised courses providing opportunities for learners to develop occupational skills for AI-related disciplines.

Reflect developments in industry and labour market demand. PTET institutions should actively monitor (including through skills anticipation, labour market analysis and engagement with employers) how AI is being adopted in the occupations that they are training learners for. Institutions should update courses, where necessary, to include exposure to the AI approaches likely to be used in industry. All learners should be given the opportunities, through their programmes of study, to develop:

- The transversal and cognitive skills (problem-solving, critical thinking, communication, teamwork) they will need to use AI applications, and to navigate labour market shifts caused by automation
- Digital literacy
- Basic critical understanding of AI

RECOMMENDATION

Reflect developments in industry and labour market demand. PTET institutions should actively monitor (including through skills anticipation, labour market analysis and engagement with employers) how AI is being adopted in the occupations that they are training learners for. Institutions should update courses, where necessary, to include exposure to the AI approaches likely to be used in industry. All learners should be given the opportunities, through their programmes of study, to develop:

- the transversal and cognitive skills (problem-solving, critical thinking, communication, teamwork) they will need to use AI applications, and to navigate labour market shifts caused by automation
- digital literacy
- basic critical understanding of AI

Recommendation: Retraining opportunities for workers impacted by AI. Governments and employers should partner with PTET institutions to help citizens navigate the implications of AI on their careers. PTET institutions should support citizens whose jobs will be changed or replaced by automation through the development of upskilling and retraining programmes. Such programmes will need to be inclusive, targeted to learners' needs and as accessible as possible, including where necessary changes to modes of delivery, outreach, and content.

06 Workforce implications and professional development

To harness the benefits of AI, PTET institutions will need to develop a workforce with knowledge and understanding of how to integrate AI into various functions – including learning and teaching, and institutional management. Attracting external staff with AI expertise may be difficult, due to competition from employers in other industries who are able to offer higher remuneration. Upskilling existing staff is therefore likely to be of importance. There is a need to engage teachers on how AI could be usefully integrated into their practice. WFCP members reported that the potential for AI to lighten workloads had been a good way to get teaching staff to buy in and engage with exploring case studies for AI.

WFCP members reported that they were already offering training to staff on generative AI tools (what they are and how to use them). Some member institutions (those using general-purpose LLMs rather than solutions developed specifically for education case studies) were also offering training on prompt writing. One institution was planning to offer professional development on assessment design and generative AI, ahead of a planned review of how the institution assessed learner competencies. Several members stated they had explicitly encouraged staff to experiment with tools. Some had set up working groups through which staff could collaboratively think about how AI could be used to enhance teaching and learning practice. Another had identified AI champions to encourage colleagues to engage with AI tools.

A near-term CPD offer for teaching staff on AI in education could include:

- opportunities to learn about AI, and explore/ evaluate AI products (Nixon, 2023, Holmes 2023b)
- critical awareness of AI, being aware of the limitations of generative AI, and having the ability to critically evaluate the content it produces (Holmes 2023b)
- training and support to make sense of data insights generated by AI solutions (AI for Education, 2023)
- support with the implementation of any "unfamiliar practices" required by AI solutions being implemented (AI for Education 2023)

In the longer term, the CPD required will depend on the impact that the adoption of AI has on the everyday practice of teachers. Educause (2023) notes, for example, that using AI to move teachers 'up the value chain', to a point where they are "spending more time on higher order thinking and collaborating" has implications for both how they are trained and how they are supported to develop their practice.

Digital leadership will also be important. Senior leadership in institutions will need to be AI literate, scanning the landscape to identify the opportunities to use AI to improve institutional performance. Drawing on their experience in the universities sector, Husbands and Kay (2024) recommend that institutions allow for a "mix of bottom-up and top-down" approaches in managing the adoption of AI, combining institution-wide "strategic prioritising and resource decisions" with scale-up of successful innovations developed by educators. Coleg Sir Gar and Coleg Ceredigion in Wales provided a real-life example of this approach – with the college identifying four areas where they would invest in utilising AI and offering training to staff, but then allowing dispersed teams to experiment with how the technology could be used in practice - "rather than telling people what they can do with it, it's more about working with them to find out how it'll improve their practises".

RECOMMENDATION

PTET institutions should develop CPD offerings for their staff – covering how AI works, its risks and limitations, legal requirements, and the institution's approach to AI.

Conclusion

Ultimately, AI is not an innately positive or negative technological development – it all depends on how the technology is used. In sporting terms, as Hoffman et al (2023) recently put it, the use of AI tools can be analogous to either an athlete's use of a coach (helping them to improve their capability with net positive long-term results), use of better running shoes (helping them to do things faster) or use of a performance-enhancing drug (providing a shortcut with net negative results).

AI presents significant opportunities for PTET institutions to enhance outcomes for learners, and provides potential new mechanisms to tackle some of the big challenges that institutions face. It has particular potential in areas with fewer human and financial resources, where technology could be used to provide learning and coaching opportunities that are not currently possible. However, using AI also involves taking on substantial risks that it is crucial that institutions are aware of and actively managing. Applied in the wrong way it could result in a degradation of learning experiences, or expose learners

PTET institutions and other sector stakeholders should therefore 'proceed with caution' – exploring applications of AI to learner challenges and institutional challenges – but grounding their decision-making in the interests of learners, and considerations of equity, fairness and human-centredness.

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