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Issue 45, March 2025

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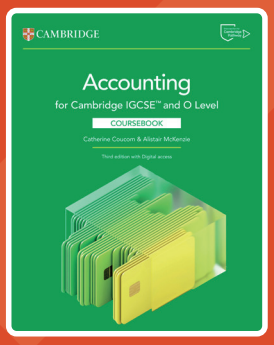

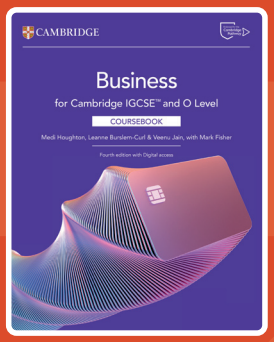

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Cambridge Pathway

Issue 45, March 2025

Using technology to enhance teaching and learning

Technology is rapidly reshaping every aspect of our lives – how we shop, connect, work and spend our leisure time. Education is no exception. From eBooks to personalised learning apps to online collaboration platforms, technology is redefining how we learn and teach.

This special issue of Cambridge Outlook magazine outlines how we are working with our community of schools around the world to prepare young people to thrive in an increasingly technological world.

In June 2026, we will introduce our first digital Cambridge IGCSE™ and International AS & A Level digital exams (page 6). We have been working with early adopters to create and test reliable and valid digital assessments while ensuring schools are supported in their implementation (pages 8 to 11). This collaborative approach reflects our belief that innovation should be guided by the needs of our community, ensuring that both the content and delivery of assessments remain effective and relevant.

It's clear that artificial intelligence (AI) will play a significant role in future jobs and society. However, at Cambridge, we believe that the conversation around AI's role in education should not be solely focused on AI. More important is the role of human intelligence and how the two can work together to enhance teaching and learning (pages 16 to 17 and 18 to 19).

Ultimately, our goal is to empower teachers and learners to harness the benefits of technology while preserving the irreplaceable value of human insight and creativity. This issue explores these exciting developments and showcases how Cambridge is helping shape the future of international education – preparing learners to be ready for the world.

Rod Smith, Group Managing Director, International Education

Ready for the world.

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Any feedback on this issue?

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Exams: why go digital?

Digital exams have the potential to deliver many benefits, from reducing paper-usage to improving security. However, crucially they will also unlock new opportunities for learners. We talked to some of our digital exam specialists to find out more.

One of the key benefits of digital exams is that students will gain more control over their exam experience. This will aid all students, but especially those who have additional needs and disabilities.

We currently offer a wide range of access arrangements and modifications for paper-based exams, such as the option to have enlarged text, different-coloured paper and extra time. However, digital exams allow for new ways to both replicate these modifications and enhance the exam, providing a more personalised and inclusive experience for students.

More accessible for all

Hannah Templeman, Digital Assessment Creation Specialist at Cambridge, is working on the development of an accessibility tool for digital exams. "It's about giving all candidates, not just those with access arrangements, the opportunity to be assessed in a way that works best for them. They will have the ability to increase the font size, as well as the line spacing and the character spacing to suit their preference. They can also change the background colour or contrast to make the text easier to read, or switch the whole exam to a dyslexia-friendly font.

> "Accessibility is a huge and important part of our work."

"There is so much potential with digital, and flexibility as the candidate can switch these modifications on and off. For example if a candidate just wants to view one question in a chemistry exam in a larger font, they can."

Hannah adds, "Our focus is on making digital exams the best experience for all students, and accessibility is a huge and important piece of that work."

Building the digital literacy of learners

Our learners are living and studying in a world where working digitally is part of everyday life. However, the move to digital exams is not just about creating a more familiar way of working for students – it will also support their digital literacy.

Before students take a digital exam they will need to become familiar with the platform so they know what to expect. "We're requiring learners to navigate online platforms and interact with digital interfaces," says Sanjay Mistry, Cambridge's Head of Digital Insight and Impact. "This helps build their overall confidence with technology."

> "We can embed tools into a digital exam that students can use to manipulate data."

Students' proficiency with keyboards, touchscreens and features such as uploading files or using applications or spreadsheets will be further developed and enhanced in different ways depending on the format of the digital exam they are taking.

Cambridge works closely with universities to ensure that Cambridge International AS & A Level qualifications develop the skills they look for in applicants, which in turn help students to succeed at university. As we develop new and existing qualifications where digital exam components are being considered, we will engage with both industry specialists and higher education institutions.

"If you think about science, technology, engineering and maths (STEM) subjects for example, students need to be able to interpret and interrogate data as they progress through higher education and the workplace," says Sanjay. "Digital exams have the potential to enhance these data literacy skills and close the gap between school and university. For example, we can embed tools into a digital exam that students can use to manipulate data that reflect real-world situations. We can capture what the students are doing and assess their competency."

More control, less stress

In the future, digital exams have the potential to improve the language testing experience for students by introducing new capabilities. For example, they could be in control of their audio – listening to a recording as often as they want, which also reduces the stress of language exams.

In our July 2025 series of digital mock exams we'll be offering schools the opportunity to take Cambridge IGCSE Spanish as a Foreign Language for the first time. So far, English as a second language has been the only language we've assessed in the digital mocks, but we want to give schools and learners experience of taking other languages in the digital environment in preparation for digital exams.

> "Students will be able to answer all the questions on-screen."

Hannah North, Digital Product Manager, is currently working on the development of Cambridge IGCSE Spanish as a Foreign Language as part of our rollout of digital exams. She explains that digital exams could improve the test experience for language learners: "Students will be able to answer all the questions on-screen during the listening exam and their responses will be saved automatically. This means candidates do not have to transcribe their responses onto a multiple-choice answer sheet at the end of the exam. It takes away this extra task for students and reduces the risk of error."

Our digital roadmap

The introduction of digital exams won't happen overnight. But with careful preparation through our Digital Mocks Service and Early Adopter Programme, schools can embrace the future of assessment with confidence.

In October last year, we shared our roadmap towards the launch of digital exams. From June 2026, students at some of our schools in Europe, Middle East and North Africa, Pakistan and the US will be the first to take digital exams through a limited launch programme covering six subjects to begin with (multiple-choice question papers in Cambridge IGCSE Accounting, Economics, Biology, Chemistry and Physics, and International AS Level English General Paper).

Our plan is to grow the digital exam offering to include more subjects and extend to other regions. By 2033, our ambition is for 85% of Cambridge IGCSE and International AS & A Level qualifications to have a digital option.

To prepare for these final digital exams, we have invited some schools to participate in an Early Adopter Programme (EAP). This includes a support package that helps familiarise teachers and learners with the digital platform, understand its features, and learn how to use it effectively, along with supporting tuition materials.

> "Our plan is to grow the digital exam offering to include other subjects and extend to other regions."

As we build digital exams together with our Cambridge community of teachers and learners, feedback from schools participating in this programme is continually being incorporated into our digital development programme.

Enhancing learning

The EAP also allows schools to take part in our Digital Mocks Service. Since it was launched in 2023, over 21 500 learners in more than 200 schools across 50 countries have taken part in the service, which has offered 16 subjects to date across Cambridge IGCSE and International AS & A Level.

Our digital mocks benefit from automated marking for the multiple-choice questions, which is completed within two hours. Cambridge examiner-marked components for the long-form answers are returned within 14 days, which means that digital mock exams help learners pinpoint knowledge gaps and adjust their revision strategies sooner.

Learners can also practise essential exam skills, such as typing extended responses, navigating an online interface and managing time effectively – skills that are increasingly valuable as more institutions move towards digital assessments. The Digital Mocks Service provides a like-for-like experience of a digital exam, but in a practice setting. This allows teachers and students to familiarise themselves with what is involved.

Reducing workload, enhancing insights

Beyond benefitting students, the Digital Mocks Service also relieves educators of one of their most time-consuming tasks: manual marking and grading. Teachers no longer need to mark hundreds of paper-based tests within short timeframes. By using our automated marking, or rapid Cambridge examiner marking, teachers can allocate more time to analysing student progress, identifying trends, and offering targeted interventions to those who need additional support.

Our Digital Products & Services team is also carrying out proof of concept studies to train AI on previous student answers to recognise key words, phrases and structures. "We want to understand how accurate an AI-generated mark is compared to the human examiner's mark when it comes to assessing subjective answers," says the team's Head of Digital Insight and Impact, Sanjay Mistry.

"Ultimately, a robust and reliable AI-assisted marking system, which is integrated as part of the Digital Mocks Service, would provide faster results and allow rapid expansion of the service to more learners. We will have an examiner involved in the marking process to provide rigorous quality assurance of any AI-assisted marking."

For schools, the digital mocks are a crucial tool in assessing technological readiness and preparing for the shift to digital exams. Schools can test their infrastructure and refine their exam processes in a low-risk environment before full digital adoption.

Transitioning from traditional paper-based assessments will not happen overnight and it can be daunting. Schools will likely operate in a paper and digital model for years to come, making it crucial to understand how different formats impact student performance. The digital mocks serve as a crucial bridge, helping learners and schools get comfortable with navigating a digital exam platform.

"Our digital mocks benefit from automated marking for the multiple-choice questions, which is completed within hours."

July 2025 Digital Mocks Service

Digital mock exams are available for a range of Cambridge IGCSE Accounting, Economics, Biology, Chemistry, Physics and Spanish papers in our July series.

Find out more at www.cambridgeinternational.org/digital-mocks-service

Early adopters: schools paving the way to digital

Since our Digital Mocks Service launched in 2023, over 21500 learners in 50 countries have taken a digital mock exam selected from 16 subjects across Cambridge IGCSE and International AS & A Level. Here, three exams officers share experiences of trialling digital.

Kenyi Valentina
Riviera High School, Rwanda

Kenyi Valentina is the Exams Officer and Physics Teacher at Riviera High School, Rwanda, East Africa. Students at the school sat Cambridge digital mock exams for the first time this January.

"We have entered a world where everything is about technology," says Kenyi. "Taking digital exams aligns perfectly with the 21st century, giving students an opportunity to improve their digital literacy."

When Kenyi consulted the school's principal and deputy principal about participating in digital mock exams, it was easy to get their agreement: "They completely welcomed Cambridge's proposal and agreed that it's the way to go."

The digital platform is easy to use for both students and staff: "Feedback was really positive. When there is change, there are those who feel tied to the previous ways of doing things, but once everyone started using the platform, they recommended it as a good way to go."

Key functionality for students

Students took digital mock exams for the multiple-choice question papers of Cambridge IGCSE Biology, Chemistry, Physics and Economics. "A really good feature was the tool for flagging a question," says Kenyi. "If a student wasn't sure of an answer, they could just flag the question for themselves and continue to the next one. At a glance, they could easily see where the flags were to go back and work on a question they hadn't answered."

Digital exams are also good for improving students' time management skills, he believes. "The platform starts a clock and when your time is done, the exam stops. In that way, it trains students to manage their time, and time is a resource that will be very beneficial to them."

> "Digital exams give students an opportunity to practise their digital literacy."

More practice needed

Some students took digital mock exams in essay papers for two Cambridge International AS Levels – Global Perspectives and Psychology. Kenyi says: "I saw with Global Perspectives that if students were not used to typing at a good speed, this was obviously a disadvantage. They will need more practice so they can improve their typing speeds and more digital practice so that these exams don't come as a big surprise – that is the biggest fear they have."

Putting trust in technology

Before the mock exams, Kenyi had been concerned that the school might experience technical problems. "I worried that the internet might break down or a student's device might malfunction, or

the platform might encounter a problem, but the exams went smoothly. We didn't encounter any technical challenges. Every student was able to start the exam and submit it at the end without any issues. That really convinced me the system is technically sound."

The mocks experience supported Riviera High School's decision to take part in Cambridge's Early Adopter Programme as a training ground for the digital exams in June 2026.

Amro E Atabani
Excellence Junior School, Cairo, Egypt

Amro Atabani is the Principal and the Exams Officer at Excellence Junior School, Egypt, which opened in 2021. The school's 700 students are Sudanese.

"As a general rule, it's our policy to participate in new Cambridge initiatives," says Amro. "We immediately showed an interest in digital mocks and registered our intention to take the exams." Amro believes that going digital is good for the school's reputation: "It's very important to be up to date and not just use the old-school way of running exams."

Reassuring parents about going digital

Around 50 students at Amro's school sat one or more of the multiple-choice question papers available for five Cambridge IGCSE subjects in January 2025 (see page 6). Before these digital mock exams took place, some parents were concerned about introducing a new system, especially before the end of the academic year, says Amro.

> "It's about assessing the readiness of the school to run these tests."

"They were asking about the content of the mock exam. We told them, yes, it's going to cover the whole syllabus, but it is not about assessing the academic skills of the students. It is about assessing the mechanism and the readiness of the school to run these tests.

"We know our students, and when we analysed the results, we could confirm that they were a very good match for exactly what level each student was at."

Understanding the new process

Introducing the digital exams was easy, says Amro. "We had a preparation call with Cambridge and the instructions were clear. We didn't have any issues with how to manage or start the exam itself, and right after the exam, we had another call with Cambridge."

Amro says he felt confident that students would not have any difficulty adapting to the digital system. "It is user-friendly, and the majority of our students are experts in using computers," he says. He also found the platform easy to use. "Booking students onto the system and getting login details was straightforward. The best feature is the master checking system which allowed me to monitor the exam itself on my laptop, and that was crucial. If I saw any 'pendings', meaning that a student had not yet started their assigned test, I went to see exactly what was happening. That control tool was very powerful."

> "We didn't have any issues with how to manage the exam."

Tech plusses and minuses

"We're fully experienced with the logistics involved in running paper-based exams, and I think going digital is highly secure," says Amro.

One factor that schools in some parts of the world need to consider is the stability of the electricity supply. This is something that Amro says Excellence Junior School made sure it was prepared for. "We have two large power generators just in case anything happens with the electricity supply. The whole team was on standby mode, but we had a very good experience.

"In terms of disadvantages, the only issue we had was internet delays. When the students answered a question and moved to the next step, sometimes there was a delay. It's a 45-minute timed exam so you have to manage the time because of the delay. Because this was not the students' fault, I believe giving extra time is crucial here. We have a very

good technical team and we're working with them to eliminate the internet delays."

For the launch of the first digital exams, which will be taken by schools in the Early Adopter Programme in June 2026 and will be available worldwide from June 2027, Cambridge will have an 'offline resiliency' capacity. This will mean that a student will not have any pauses in exam progress if there are any drops in connectivity.

> "Logistically, digital exams are going to be easier."

Looking ahead to digital exams

The school is taking part in Cambridge's Early Adopter Programme to run digital exams in 2026, and Amro is confident about their ability to manage digital exams on a larger scale. "Right now, we are upgrading our computer labs to have 100 PCs, so we will be able to accommodate 200 students back-to-back. Logistically, digital exams are going to be easier. Long term, if we are talking about moving to digital for the whole operation, a lot of paper will be eliminated. There's a financial advantage to that too, as we won't be paying for courier charges."

Amro's final thoughts on the mock exams are positive. "Providing digital mock exams will prepare teachers, even if just psychologically, to be at ease with the system. The idea is brilliant, and we're ready."

Eric Chadambuka
CIS, Qatar

Eric Chadambuka is an Exams Officer and Biology Teacher at CIS, Qatar. He tells us why the school's students preferred digital exams.

"Our students found the digital mocks exciting," says Eric, who joined CIS, Qatar in 2019. "Paper exams are 'boring' for them – they don't like having to flip through the pages, for example. With the digital exams, they could easily review their answers at the end, get a summary of the questions they didn't answer, and go back to those."

Preparing students to go digital

The school took digital mock exams in the five available Cambridge IGCSE subjects in January 2025, and Cambridge provided support materials ahead of time. Eric says: "Cambridge sent us documents outlining all the procedures that students needed to follow. We then conducted a workshop for the students to guide them through the whole process of what to expect in the exams."

Cambridge also provided links to online practice resources, says Eric. "Before the digital mock exams, we uploaded the links to our school portal so students could practise how to do the digital mocks at home."

Students took on more responsibility when the exam was digital, says Eric. "They were more diligent in ensuring that they had answered all the questions and proceeded to submission at the end, so it made them responsible for the whole process."

> "The workload for teachers is going to be reduced as everything is computerised."

However, students' familiarity with using digital devices outside the classroom for social media meant they tended to answer too quickly. "We found that students were responding more quickly to the questions on the computer compared to when they were doing paper exams," says Eric. "They might rush to finish because they're just clicking with the mouse and not checking properly."

Making sure learners are seated early

Something Eric advises is to make sure students are seated 15 minutes before the start of the exam. "This way, we could make sure everyone was logged in so they could start the exam at the exact time. Students could also go through the instructions to get ready before the exam started."

Students had been provided with their login details just before the exam, which Eric says is a good idea in terms of security. However, some students initially had a problem logging into the platform. "Fortunately, the master checking system made it easy for us to see what was happening," says Eric. "We could see that some students hadn't entered their details correctly because they

Eric Chadambuka, Exams Officer and Biology Teacher at CIS, Qatar.

thought the letter 'J' looked like it was lowercase, but actually it was uppercase. We had time to correct it, and then everything went smoothly."

The master checking system also made it easy to monitor students throughout the test, says Eric. "It was user-friendly for teacher-invigilators. They used it to check how students were progressing and didn't need to move around the room physically to do that."

Reducing the administrative burden

"Teachers have a lot of work and are overloaded at times. With paper-based mock exams, there is a lot of work involved in preparing the question papers, whereas in digital exams, the questions are set and marking is automated, so the workload for teachers is reduced as everything is computerised," says Eric.

Eric notes that a positive for him as an Exams Officer is the reduced paperwork involved in managing digital exams. "After a paper exam, I make sure that the envelopes are packed. I cross-check before I seal everything to ensure all materials are there. But with digital, it is just students clicking the submit button, and then it's done. My stress levels were much lower because the administrative part was much easier," he says.

Boosting confidence in digital

CIS, Qatar is the first in its group of schools to use digital exams. "Our partner schools that are running digital mocks after us have been able to raise various questions with me," says Eric. "This has been a good experience and boosted my confidence through knowledge of the digital exam process. Once they've completed their digital mocks, we're planning to meet and discuss the exams together."

> "My stress levels were much lower because the administrative part was much easier."

Getting ready for digital exams

The school is looking forward to the introduction of digital exams in 2026. "When you start something new, people can have a fear of what is coming," says Eric. "After going through the whole process, any doubts were eased, and we found the digital exams to be more efficient than paper exams.

"This is an exciting opportunity for us. We learned a lot from the digital mocks, and I'm sure it will mean we are well prepared for the digital exams."

From paper to pixels: how research drives our digital development

Our digital development programme is underpinned by research from teams across Cambridge University Press & Assessment and our partners at the University of Cambridge. Here we share insights into some of our ongoing research studies into the impact of going digital.

A change in the delivery mode of an exam, such as a shift from paper-based to digital screen-based, will also require a change in both the curriculum, and the teaching and learning of a course. If the change creates negative washback (washback is the impact of testing on curriculum design, teaching practices and learning behaviours), this can be harmful to students' learning.

We carried out research to help us develop a framework that would evaluate the impact of digital exams as a new testing format.[1] According to the framework, data should be gathered in three phases:

1. Anticipated phase: Combines benchmarking and forward-looking data to assess teachers' expectations before implementation.

2. Observed phase: Collects formative data during the exam, allowing for real-time adjustments.

3. Evaluated phase: Provides a summative assessment of the exam's impact by comparing initial benchmarks with final outcomes.

Through these phases, the framework focuses on four dimensions: content, resources, interaction and affect, which help to assess changes in teaching practices, resource quality, interaction depth and learner engagement. The ultimate goal is to link these dimensions to performance outcomes, offering a comprehensive view of how the change in exam format influences learning environments.

More research is needed but initial feedback is positive. In a pilot of the framework within the development of digital exams for our Cambridge IGCSE Computer Science curriculum, teachers found the digital format fostered persistence, enthusiasm, strategic learning and initiative in problem-solving among students. They noted that students felt encouraged to collaborate and the qualification introduced unique skills, particularly through the practical programming project.

> "Together with our community of schools, we will continue to test the framework as we develop digital exams."

Together with our community of schools, we will continue to test the framework as we develop digital exams for the new Cambridge Computer Science curriculum and other subjects.

Handwriting versus typing exam scripts

Unequal access to digital tools persists both globally and within countries. Therefore, as we introduce digital exams, we will use a model so that schools can choose between paper and digital formats.

Exams in these two formats must be equivalent. One element that affects equivalency is the 'mode effect' – students responding differently to the same question depending on the mode in which it is presented and consequently receiving different scores.

We reviewed 47 studies (1990 to 2021) to examine whether handwriting versus typing answers affected the score of an otherwise equivalent exam.[2]

1. Scores: Most studies found little difference between scores from handwritten and typed exams, although some noted that English language ability and computer familiarity could influence performance. Students less familiar with computers generally did better when writing their answers by hand.

2. Marking: Handwritten essays often received higher scores than identical typed versions, possibly because typed text appears shorter, and errors are more noticeable. However, many studies on marking comparability are dated and so we need to be cautious when drawing conclusions here.

3. Text characteristics: Typed answers were generally longer and more varied in length than handwritten ones, likely due to differences in typing skills. Other differences, like language complexity, were minor.

4. Composing processes: Students generally followed similar writing processes, but those less comfortable with computers planned more when handwriting to avoid messy edits.

This research supports our combined approach of offering both digital and paper-based exams. Schools moving to digital exams should provide opportunities for students to familiarise themselves with the platform before the exam, as with our Digital Mocks Service (page 6).

> "As we introduce digital exams, we will use a model so that schools can choose between paper and digital formats."

A vision of educational assessment in 2050

How much has the world changed in the last 25 years? And how much will it change in the next 25 years do you think? At the end of 2023, together with our partners at the Digital Education Futures Initiative at the University of Cambridge, we conducted research into what exams might look like in 2050. The resulting paper, 'The Futures of Assessments: Navigating Uncertainties through the Lenses of Anticipatory Thinking',[3] highlights several factors that may drive innovation in future exams, including:

- augmented, virtual and hybrid technologies
- human flourishing and wellbeing
- climate change
- AI tutors and personalised learning.

These factors will change what, how and why we learn, and together paint a future of more immersive, personalised and holistic exams. AI in particular has the potential to accelerate learning and challenge traditional views of what classrooms

"AI in particular has the potential to accelerate learning and challenge traditional views of what classrooms and assessments look like."

and assessments look like. Anticipating such change requires a willingness to consider radical departures from established thinking and practice. This study anticipates that high-stakes exams will no longer dominate the educational landscape. More continuous, adaptive AI models of assessment will emerge, which prioritise students' wellbeing. Stress around exams will reduce and models pivot from wholly academic evaluation to more holistic approaches that include emotional, social and creative metrics.

"Stress around exams will reduce and models pivot from wholly academic evaluation to more holistic approaches."

For this vision of the future to become a reality, there is a need to ensure that the integrated systems of assessment in personalised AI tutors and new assessment models using immersive technologies have assessment integrity. Just like our paper and emerging digital assessments, we need to ensure reliability, fairness and validity.

This study further suggests that digital exams will become the norm and will be complemented with virtual reality for more immersive and augmented testing environments for hands-on subjects.

While these outcomes are only an anticipation of what the future might look like, adaptable, low-stress, holistic assessments that prepare learners to be ready for the world have always been a goal for Cambridge. Our digital high-stakes exams are a clear step along this journey.

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Teaching with AI: an assistant not a replacement

There has been a rapid move towards acceptance of artificial intelligence (AI) in the classroom. With new guidelines and resources, Cambridge is helping teachers navigate this shift and stay centre stage.

"I remember my first and second years of teaching – lesson planning took me so many hours. Even just structuring a lesson would take a lot of time because it typically requires a lot of thinking, writing and reflecting. AI will help with that."

> "AI is an assistant rather than a replacement; the role of teachers remains as crucial as ever."

Views like this, from Portuguese maths teacher Hamit Özonur, illustrate how teachers are beginning to embrace AI, rather than be wary of the technology which is transforming our lives. This shift signals a growing acceptance of AI as an assistant rather than a replacement, reinforcing the idea that while technology is advancing, the role of teachers remains as crucial as ever.

Hamit's mindset mirrors findings through focus groups, surveys and school visits where we have explored teachers' perspectives on AI in education. Initially, many were concerned about its impact on their jobs and students. However, many teachers now recognise AI's potential to save time, assist with lesson planning, marking and feedback, and administrative tasks like writing emails and reports. Rather than seeing AI as their replacement, they see it as a useful tool in their daily work.

New AI guide for teachers

The new guide on our website, Getting Started with AI in the Classroom, is a testament to growing teacher confidence[1] (see page 20). It offers practical ideas for AI use. For example:

- AI should complement, not replace, traditional teaching methods
- teachers should verify AI-generated content for accuracy and biases before sharing it with students
- students must be taught to critically evaluate AI outputs against reliable sources
- schools must have clear AI policies and avoid uploading student data, ensuring compliance with regulations like GDPR, POPIA and COPPA.[2]

Recommendations from the guide also featured in an AI session at our recent Cambridge Schools Conference Online.[3] To ensure AI enhances rather than disrupts education, Cambridge has established guiding principles (see box on next page).

References

[1]Cambridge Getting Started with AI in the Classroom guide: www.cambridgeinternational.org/gswaic

[2]GDPR (EU General Data Protection Regulation), POPIA (South Africa Protection of Personal Information Act), COPPA (US Children's Online Privacy Protection Act).

[3]Cambridge Schools Conference Session 3, Getting Started with AI in the Classroom: https://bit.ly/GSWAI_conference

Critical thinking

In addition to teaching with AI (to lesson plan and use in administration) educators must also teach about AI in terms of helping students understand AI concepts, its real-world applications and ethical considerations. The 'Cambridge learner attributes,' combined with our trusted and rigorous Cambridge Pathway, equip learners with the skills to critically engage with, and safely explore, new technologies. This was demonstrated in the recent November 2024 series through our Cambridge International Project Qualification, where students asked questions like, "How could machine-learning algorithms improve understanding of human emotions?" – showing they are already embracing AI with an evaluative and inquisitive mindset.

> "Our shared goal is to balance AI's potential with meaningful human connections, ensuring the teacher remains at the heart of education."

Using AI consciously as a tool to enhance education, rather than just depending on it passively, will help teachers integrate AI effectively. Our shared goal is to ensure that AI supports rather than competes with teachers, working alongside them to improve students' educational experience.

For more on generative AI in the classroom, listen to the Brighter Thinking Pod, episode 50: Teachers' Changing Perceptions of AI.

Key principles of AI in the classroom

Much like our approach to any classroom tool, our focus with AI is always on empowering teachers and learners in order to provide the best learning opportunities possible. We therefore define our principles as:

People first

In everything we do with AI, we put people first, ensuring AI is used responsibly, ethically and sustainably. We believe that teachers are key in delivering a rounded education. We work with our education community to understand their needs and develop solutions that empower teachers and learners.

Learning-focused

Learning about AI

We support teachers and learners to develop the skills, knowledge and understanding to embrace the opportunities and navigate the challenges of AI for both now and the future.

Increasing educational impact with AI

We carefully use technology in teaching, learning and assessment support, to empower teachers and learners to elevate learning opportunities.

Steve Watson, Associate Professor at the University of Cambridge

Co-creation in the classroom with AI

Artificial intelligence (AI) isn't just about automation – it's about communication. By acting as a 'meaning mediator', generative AI tools can help teachers reframe concepts, adapt explanations and support diverse learning needs. **Steven Watson** explains how.

AI is here to stay and it's beginning to have a large impact on education. When its features are well understood and applied based on solid research and testing, it will enhance learning while keeping education focused on human interaction, inclusivity, and empowerment. Are you using it in your classroom?

Rather than viewing AI as a tool only for automation – grading papers, generating answers, or acting like a tutor – teachers can see it as a powerful 'meaning-mediation' tool. This means harnessing its ability to simplify complex topics, reword questions, translate ideas across different learning levels and personalise explanations for students, all while preserving the essence of the information. Teachers already adjust explanations to suit different learners; AI simply extends this ability, providing additional support.

Supporting learners with AI

AI can help learners engage with content in different ways. For those from non-traditional academic backgrounds or with learning difficulties, generative AI can simplify complex concepts, provide alternative explanations, or generate personalised study guides. It acts as a bridge between the curriculum and learners' unique ways of understanding information.

For example, a learner struggling with mathematics can use generative AI for support. By pasting the quadratic formula into a generative AI prompt, they can ask questions about its meaning and applications, such as making the perfect basketball shot by calculating projectile motion or setting prices for a business to maximise profits and avoid losses. AI can provide step-by-step explanations, making the concept more accessible. Through iterative interactions, the student refines their understanding, reducing anxiety and fostering confidence in mathematics.

> "AI can provide step-by-step explanations, making the concept more accessible."

However, not all AI-generated content is accurate. Although it can present real-world uses for the above equation, for example, it may not always give the correct, absolute mathematical solution. Educators play a vital role in teaching students to think critically about AI-generated information rather than accepting it at face value.

For instance, teachers can encourage learners to fact-check generative AI responses. Ask the generative AI a historical question, then challenge students to verify its claims using reliable sources. Where is the AI accurate? Where does it fall short? Why might it have generated a particular response? This helps learners develop research and reasoning skills while reinforcing the idea that AI is a tool, not an authority.

Similarly, generative AI can help learners explore different perspectives. If a student asks generative AI to summarise a political event, they can compare the response to various news sources and discuss how meaning is shaped by context, bias and language. These exercises turn AI from a passive answer-generator into an active participant in meaning-making.

> "AI can also produce practice questions, helping students prepare more effectively."

AI in exams: a pedagogical shift

One of the biggest concerns in education is AI's role in assessments. While AI-generated tests and automated grading are being explored, these tools still require human oversight. Instead of fearing AI's involvement in exams, educators can focus on how it can be used effectively. For instance, generative AI can rephrase exam questions to make assessments more inclusive. A history question like "Explain the causes of the Industrial Revolution" could be rewritten as "What were the key factors that led to the Industrial Revolution?" or "Describe the main reasons the Industrial Revolution began". This helps learners with different comprehension levels while keeping the core meaning intact.

AI can also produce practice questions, helping students prepare more effectively. With proper guidelines, AI can enhance assessments rather than undermine them, providing insights into student performance and highlighting learning gaps. Instead of replacing human judgement, AI can offer data-driven insights, helping educators tailor their support.

Breaking down barriers to adoption

In higher education, research suggests that a far greater percentage of students use generative AI compared with staff. In schools, adoption rates are even lower. If we are to improve AI literacy, we must remove misconceptions – such as the belief that generative AI retains and learns from prompts – that can contribute to this reluctance. Addressing these concerns with clear, practical explanations is crucial.

A key mindset shift is recognising that generative AI is a collaborative tool, not a replacement for creativity or critical thinking. Just as calculators didn't eliminate the need for mathematical reasoning, AI won't replace human intelligence – it can enhance it.

Schools can support generative AI integration by providing hands-on opportunities for teachers to experiment with it. Small, practical uses – like generating lesson ideas, drafting emails, or developing informal assessments – can build confidence. A headteacher I know found AI particularly helpful in drafting responses to complaints, saving time while ensuring fairness and thoroughness.

> "AI won't replace human intelligence, it can enhance it."

Moving forward

At its core, generative AI in education should empower teachers rather than replace them. Whether generating learning materials, offering personalised student support, or streamlining administrative tasks, AI has the potential to enhance teaching in meaningful ways. For educators unsure where to start, the best approach is simple: try it.

Further reading

Watson, S. (2025). Cambridge Elements: Emergent discourses in generative AI in education https://doi.org/10.13140/RG.2.2.29773.14562

Our Getting Started with AI in the Classroom guide helps you understand AI, its benefits, and how you can use it practically in the classroom, regardless of your level of technological expertise: cambridgeinternational.org/gswaic

Take a course

An Introduction to Generative AI for Human-Centred Integration and Organisational Literacy www.educ.cam.ac.uk/courses/ppd/practice/generative-ai-hci/

Support for schools

The latest resources and developments to support you and your learners

Getting started with AI

Cambridge teachers have told us they want more support with how to use AI in the classroom, so we've just published a new interactive guide that includes practical tips and advice.

Getting Started with AI in the Classroom gives ideas on how to use AI tools in many ways to save time and enhance teaching and learning, including:

- providing language support in multilingual classrooms
- personalising learning
- encouraging collaboration
- gamifying traditional lessons.

The guide also suggests prompts that students can use with generative AI learning assistants to help develop their own skills in using AI effectively. For example, students can use self-assessment tools to get feedback on a task they have completed in class and then work in groups to evaluate and improve their responses.

As well as the benefits, the guide covers some of the concerns around the use of AI in education and includes a checklist to help schools identify where AI can add value. Find the guide at: www.cambridgeinternational.org/gswaic

You can also watch a recording of the 'Getting started with AI in the classroom' webinar from our recent Cambridge Schools Conference Online. Go to www.cambridgeinternational.org/csc

A fun way to teach maths

Minecraft Education and our colleagues at Cambridge Mathematics have come together again to create a new mathematical adventure!

In Ratio Riddles, players enter a school of magic where they work with ratios, fractions and scale factors to complete fantastical challenges, establish foundations of proportional reasoning and graduate with high honours.

Ratio Riddles, which is accessible to learners from primary ages onwards, is available in 29 languages in Minecraft Education. Find out more at www.cambridgemaths.org/for-teachers-and-practitioners/games/ratio-riddles

Helping you to plan ahead

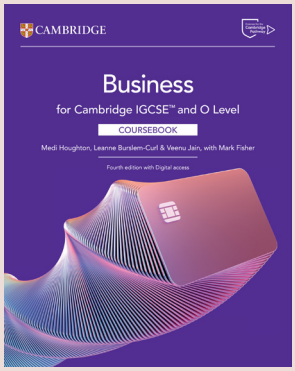
Visit the What's New area of our website to find out about our latest developments, including changes to Cambridge Checkpoint tests in 2026, new Cambridge IGCSEs in Arabic and Japanese as a Foreign Language and updates to syllabuses. Go to www.cambridgeinternational.org/new

US hosts next Cambridge Schools Conference

Booking is now open for our next in-person Cambridge Schools Conference, which will take place in Miami, Florida from 17 to 18 June 2025. Learn more at www.cambridgeinternational.org/csc

Endorsed resources

Our subject experts thoroughly evaluate each of these titles to make sure that they are highly appropriate for Cambridge programmes.



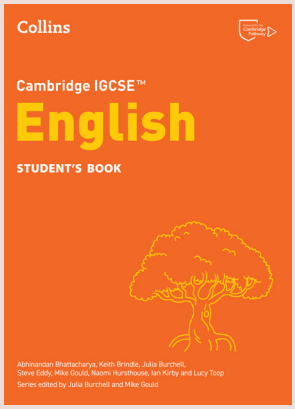
Cambridge IGCSE™ and O Level Business (Fourth edition)

Resource: Coursebook with digital access, Digital Coursebook, Workbook with digital access, Digital Teacher's Resource

Published by: Cambridge University Press & Assessment

Support your students as they build an understanding of key business concepts, with engaging activities and real-life examples to ensure topics are accessible for all. Case studies with questions encourage students to explore roles and operations within real businesses. Access additional activities and teaching support in the workbook and teacher's resource.

Website: www.cambridge.org/education/subject/business-and-economics/business-studies/cambridge-igcse-and-o-level-business-4th-edition



Cambridge IGCSE™ English (Fourth edition)

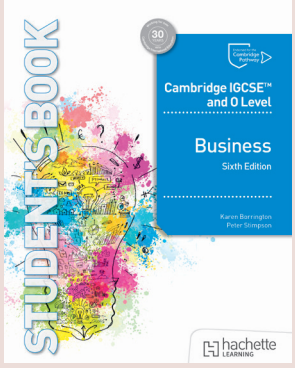
Resource: Student's Book, Workbook and Teacher's Guide (Print, Ebook)

Published by: Collins

The new fourth edition focuses on developing essential skills in reading, writing and language analysis while offering multiple speaking and listening opportunities. It features rich and diverse international texts, showcasing varied writing forms and purposes. These resources have been developed for the updated syllabuses for examination from 2027.

Website: www.collins.co.uk/igcseenglish

Email: collins.international@harpercollins.co.uk



Cambridge IGCSE™ and O Level Business

Resource: Student's Book: Print and eBook, Teacher's Guide: Digital teaching and learning resources, Workbook: Print

Publisher: Hachette Learning (formerly Hodder Education)

Discover business theory beyond the classroom by exploring real-world international business case studies. This new edition of our tried-and-tested Student's Book ensures full coverage of the latest Cambridge IGCSE, IGCSE (9–1) and O Level Business Studies syllabuses (0264/0774/7081) for examination from 2027. An updated Workbook and Teacher's Guide are also available.

Website: www.hachettelearning.com/Cambridge

Student voices – what it's like to sit digital mocks

As part of our digital journey, our development team has been conducting research with students around the world who have taken digital mock exams. Here are some of their views.

Benjamin Hertz, 16

Lemon Bay High School, Florida, USA

Benjamin was positive about the ease of completing his digital mock: "I prefer to use a computer and type if there is an essay. My main reasons are the fact that you can go back anywhere in your response and add or remove words. I write really slowly because it hurts my hand, so it's easier for me to type faster and finish the essay in time."

When we asked Benjamin about the features of the Cambridge digital mock exam, it was something simple and often overlooked that helped him the most. "I think the word count feature was very useful, as it lets us compare our word count to what the prompt says our word count should be." This saved Benjamin time counting words and meant he wasn't worried he'd written too much or too little.

We asked Benjamin: If you had a magic wand, what would you like to change about sitting your Cambridge International AS & A Level exams? His response was to take them all online!

Akanska Ganesh, 16

UIA International School, Japan

Psychology is Akanska's favourite subject and she feels like she always has a lot to write. "It helped me doing the mock digitally because usually there wouldn't be enough space to fully write down the answer I want to. But during the digital test I was able to expand on my answer and it was also less time consuming."

In the near future, more Cambridge qualifications will have the option of a digital exam, but we understand that paper exams will still have an important place.

"I would definitely prefer to have the majority of my exams for subjects digitally, except for maths. In maths, we have a lot of drawing or graph questions and I think, at least for me, it'll take a long time to get used to plotting graphs digitally."

Akanska is not alone in this view. We have spoken to many students during our research, and although the majority have been enthusiastic about taking digital exams, there is still a strong vote for paper exams to remain for specific subjects.

Sruthi Venkatesh, 17

Heartfulness International School, Omega Branch, India

Sruthi's feedback highlighted how digital exams can help students with time management and organisation. "The exam felt very organised as each part was divided into sections. This was convenient for me when revisiting a question I had previously left behind. The timer allowed me to keep track of the duration with ease and I could track my progress clearly."

However, Sruthi admitted that when she first started the digital mock, it took her a little while to get used to. "It was quite different from a paper exam, typing was hard to adjust to, but as I began answering the questions it got easier. It was a little stressful initially, but I got the hang of it quickly."

Sruthi's initial experience highlights the important role that digital mocks play in giving students practice typing out answers. Building typing speeds and overall confidence with technology is not just important for further education, but also the world of work.

Lindsay Nadin, Education Digital Products and Services Director
International Education

How tech could change what we measure

As the teaching and learning landscape evolves to meet new workplace demands, we must rethink not just how we assess, but what we measure. **Lindsay Nadin** looks at the potential of digital exams to offer a solution.

Imagine a science exam where candidates step virtually into a lab and use costly chemicals to design new treatments which must be shown to kill dangerous microorganisms. Or a business exam where students build a new company and lead an executive team through augmented reality to deliver products in a challenging global supply chain. Through such exams, students will be moving beyond theoretical understanding and demonstrating applied knowledge aligned with the real-world skills sought by employers. All this may one day be possible through digital exams.

Digitisation is changing the world of assessment. In time, digital exams will enable new ways to examine what students know and can do. This change will bring new opportunities to align curriculum and assessment with evolving teaching and learning practices and to prepare students for the future.

Continuous, skills-based testing

As more exams become available in digital formats and their administration simpler, we could see more opportunity for ongoing, skills-based assessment of a student's knowledge, with dynamic progress tracked throughout their education. This type of continuous assessment approach, recorded through digital credentials, could bring benefits such as allowing for better adjustment of a student's study as areas for development are surfaced.

Continuous testing to create a holistic profile of a student's capabilities could also strengthen resilience against disruptions to their education caused by personal circumstances or large-scale events, such as pandemics or climate crises. As with any form of assessment, we will still need verification processes, including reliability and validity measures, to ensure the integrity of digital credentials, preventing cheating and ensuring that they accurately reflect students' abilities.

AI in exams

In addition to supporting faster examiner marking, AI will help digital exams of the future in terms of accessibility and personalisation. Digital exams, supported by AI advancements in auto-marking, quality assurance, and remote proctoring technology, also create the possibility of on-demand testing.

> "In time, digital exams will enable new ways to examine what students know and can do."

An ever-changing world

Today, an estimated third of the world's population lacks internet access. As such, countries vary in their readiness for digital transformation. Aware of this digital divide, Cambridge continues to support and listen to schools to make sure that students everywhere can take exams, whether on paper or in digital format, that allow them to demonstrate their knowledge and skills. Ultimately, the future of assessment is about more than just digitisation – it's about rethinking what we assess and how we assess it. The goal should be to prepare students not just for tests, but to thrive in an ever-changing world.

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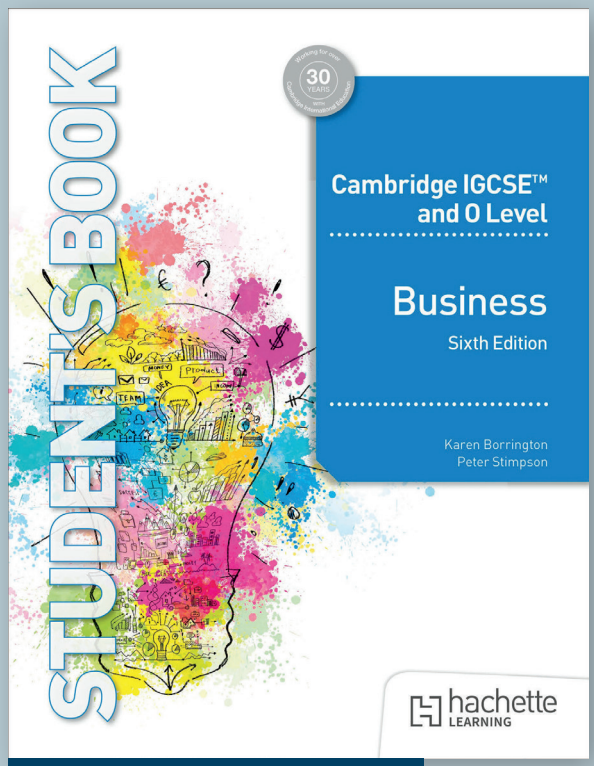
Revised and updated by our experienced author team, this Sixth Edition provides accessible content for all learners, with enhanced author-written practice questions, updated global examples and an improved structure.

The Student's Book is endorsed for the Cambridge Pathway to support the revised Cambridge IGCSE™, IGCSE (9-1) and O Level Business Studies syllabuses (0264/0774/7081) for examination from 2027.



Available from March 2025

Also available

Third Edition Workbook* and Digital Teacher's Guide*

hachettelearning.com/cambridge

*These titles have not been through the endorsement process for the Cambridge Pathway.

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