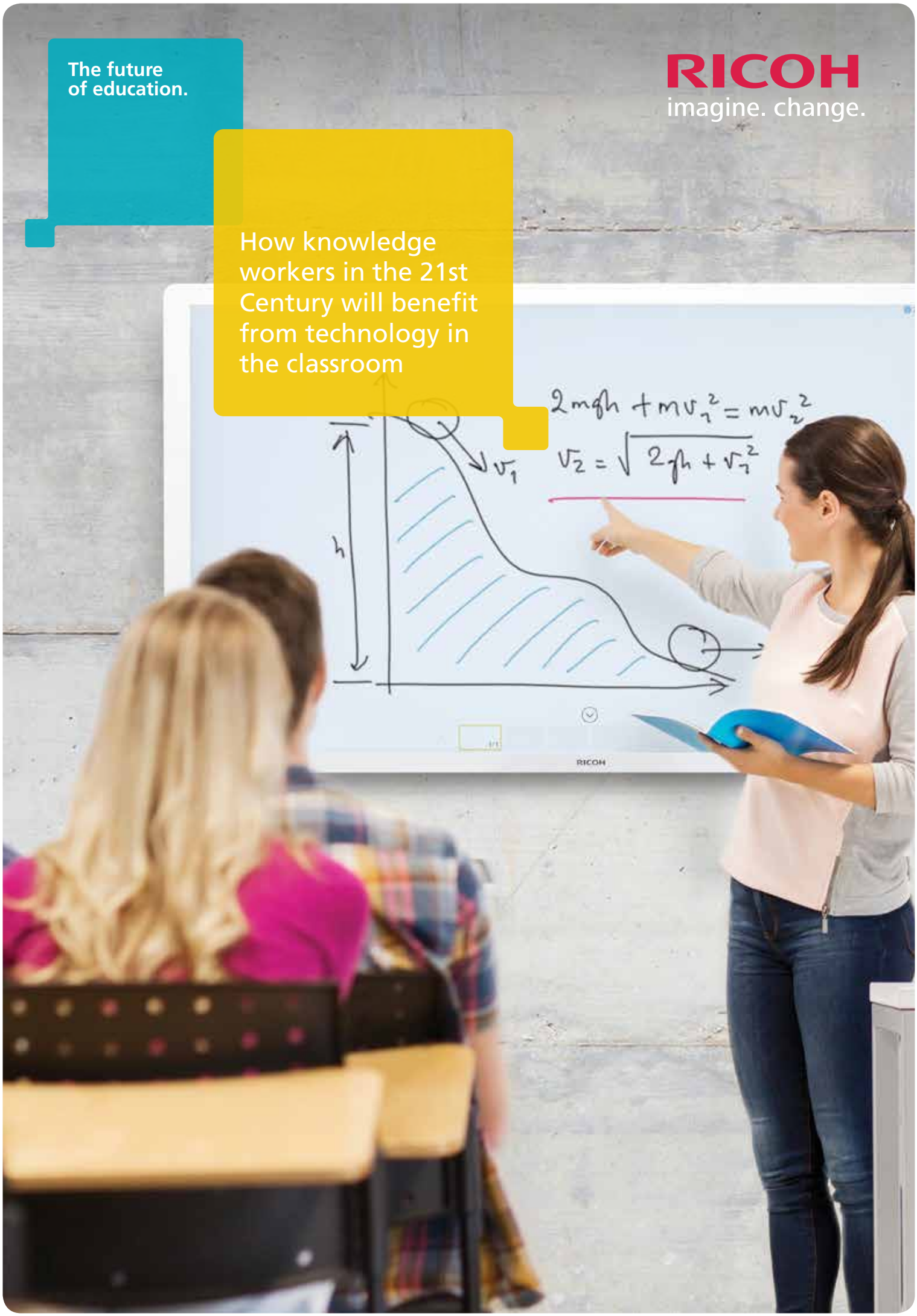
The future
of education.

RICOH
imagine. change.

How knowledge workers in the 21st Century will benefit from technology in the classroom



The evolution of education

Classrooms have changed dramatically over the past two decades, creating an almost-unrecognisable learning environment for parents and students who remember chalkboards and exercise books as the sole education tools. Now, devices including iPads and laptops are used prolifically across all levels of education, while collaborative technology like Interactive Large Format Touchscreens (LFTs) play a key role in daily learning.

Today's school children are digital natives by default, and most know their way around an iPad by the time they start kindergarten. At the same time, most adults use a various array of technology as a matter of course in their daily lives. Schools and tertiary education institutions, as well as training organisations, can't ignore incorporating digital learning systems into their teaching environments.

Eliminating barriers

Overall, technology advances have led to an enriched learning environment that lets students explore topics more deeply. They can watch videos, listen to radio reports, and gain access to a far wider band of knowledge than the one provided by their own faculty.

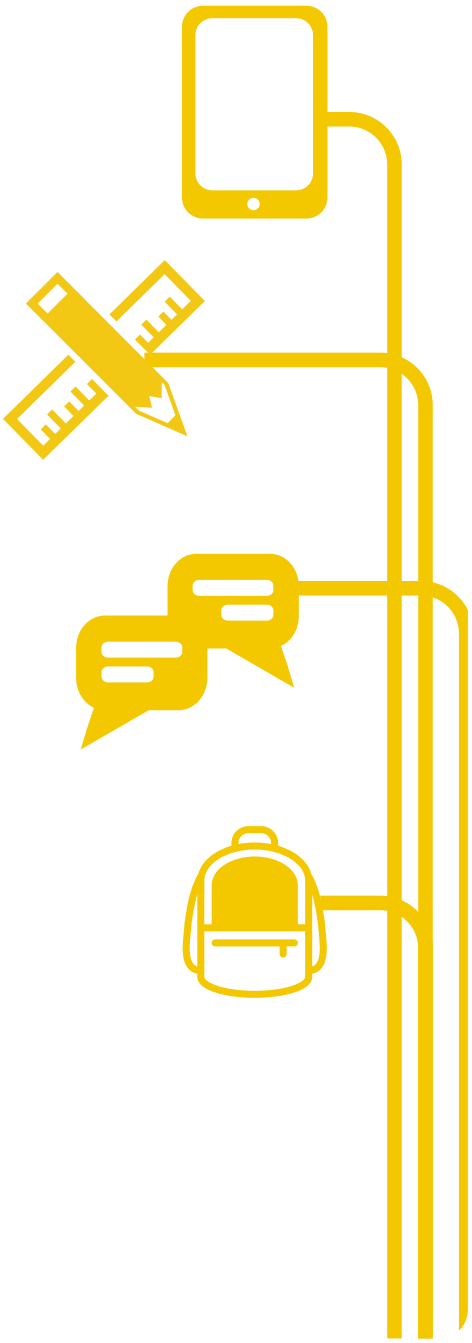
This new technologically-advanced approach to learning benefits all students equally, as long as the educational institution they attend has the right infrastructure in place. Gifted and talented students can access materials that extend and supplement their learning, while students needing more support can get the help and additional materials they need online.

As such, technology helps to overcome barriers to learning in positive ways regardless of the student's individual needs and challenges. It does this through providing access, engagement, and prevention. Access will ensure all students have equal opportunities to learn and address any barriers to learning. Engagement happens when learning materials are personalised to suit the interests and abilities of the individual student. And prevention helps identify areas where students are struggling before they fail.[1]

Technology has also helped teachers gain access to materials that augment their own education and experience. A quick check online can help them come up with new ways to teach the same material, and it can put them in touch with other teachers from around the world who can share their experiences.

Using the right kind of technology in certain classes can help with so-called flipped classrooms. In this environment, students are expected to absorb the materials before class, then come to class ready to participate in activities and discussions previously considered 'homework'.

It can also make distance learning far easier and less isolating for students.



1 *Examples of Using Interactive Technology.* Adelman & Taylor. UCLA, 2014.

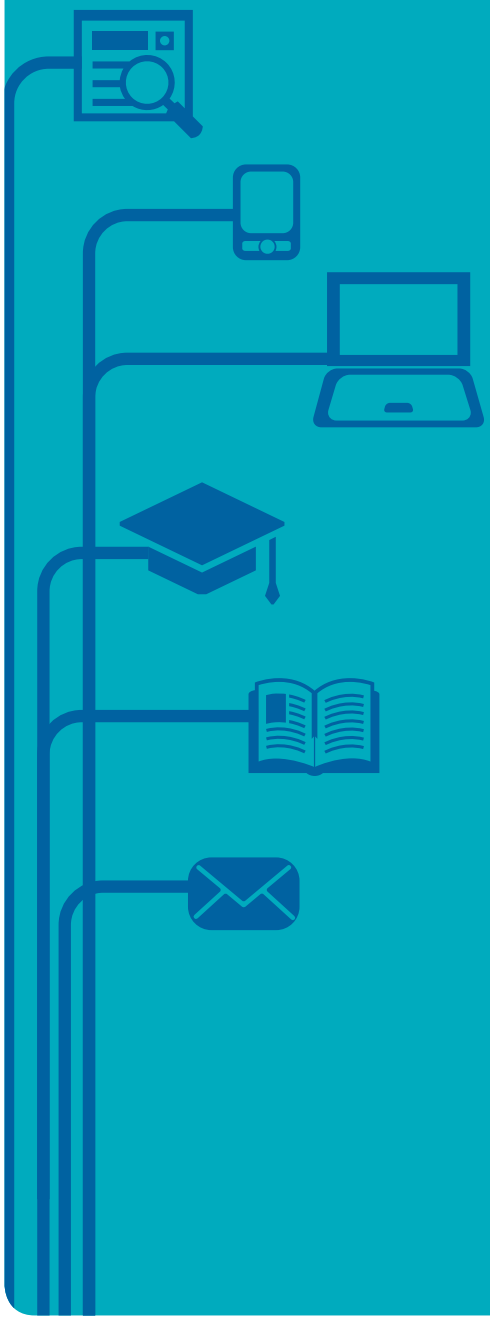
Does technology really affect learning outcomes?

Research shows that 47 per cent of teachers strongly agreed, and an additional 44 per cent somewhat agreed, that students need digital literacy courses to be successful academically and beyond.[2]

Two United States-based studies that separately followed fifth and eighth graders who used tablets for learning in class and at home found that learning experiences improved across the board. 35 per cent of the eighth graders said that they were more interested in their teachers' lessons or activities when they used their tablet, and the students exceeded teachers' academic expectations when using the devices. When self-reporting, 54 per cent of students say they get more involved in classes that use technology and 55 per cent say they wish instructors used more educational games or simulations to teach lessons.[3]

Technology opens up opportunities to enrich the classroom experience and promote student engagement. For example, guest lecturers can appear using video conferencing technology, and can interact with the class in ways that have never been possible in the past.[4]

Where there is no single textbook that adequately covers the materials that need to be covered, technology and the ability to access information from anywhere on the World Wide Web can bridge the gap.[5]



A caveat

It's essential to make sure technology is used for a clear purpose and not just for its own sake, or it could become a distraction, according to Vanderbilt University's Peabody Professor Margaret Smithey.[6] She says that when technology is used to flip the classroom, students come to class with a common context. This way, no time is wasted laying the groundwork: instead the class can dive straight into substantive discussions.

It is also important to ensure that the classroom's physical design supports the best possible use of technology.[7]

---

2 *How Teachers Are Using Technology at Home and in Their Classrooms.* Kristen Purcell, Alan Heaps, Judy Buchanan, and Linda Friedrich, Pew Research Centre, Washington, DC. 28 Feb 2013.

3 *Do mobile devices in the classroom really improve learning outcomes?* Matthew Lynch, dean, Syphax School of Education, Psychology & Interdisciplinary Studies, Virginia Union University. The Conversation, 31 March 2015.

4 *How Technology Enhances Teaching and Learning.* Ellen M. Granberg. Centre For Teaching, Vanderbilt University. Teaching Forum, Fall 2000 issue.

5 Ibid.

6 Ibid.

7 Ibid.

What kind of technology helps students learn?

Educational institutions tend to introduce technology with the aim of engaging students more deeply, and therefore helping them to learn.

Research into best practices for teaching and learning in higher education suggest students should take an active role in their learning through cooperating with peers to meet learning goals. The use of technically-oriented pedagogy has become a go-to method as instructors attempt to connect with and engage students in both small and large classrooms.[8]

Research has shown that the use of technology in the classroom produces positive results, especially regarding students' perceptions of teaching effectiveness, active collaborative learning, a sense of engagement with course content, academic activities, and increased academic achievement.[9]

Personalising the learning experience can be a good way to overcome larger class sizes, and technology provides a way to achieve this. [10]

Interactive technology

Interactive and collaborative technology can facilitate student engagement in a traditional classroom setting. It also lets teachers and students experience a full learning experience regardless of location.

Interactive technology that uses connected devices and teaching aids, lets students provide individual responses via a tablet or app. Teachers can ask a question, to which the students respond; anonymously if preferred. This gives educators instant feedback regarding how well their materials is understood by students.[11]

One of the most ubiquitous forms of interactive technology is the interactive white board (IWB). In New South Wales, where IWBs have been used for a more than a decade, there is overwhelming support for their use by both teachers and students.[12]

IWBs and similar devices such as large format touchscreens (LFTs) provide a familiar way to present information to students, while also letting them interact with that information to help facilitate the learning process. For example, LFTs can transfer a computer's monitor onto a whiteboard where a touch screen can be manipulated. An LFT offers a collaborative learning experience that is engaging and inclusive.

To make the most of interactive technology, teachers must accept that a fundamental shift away from teacher-centred learning towards student-centred learning is inevitable. Ideally, interactive teaching and learning will be supported by tools that actively engage both teachers and students.[13]

It is therefore important to provide the necessary training, and the time required for professional development, to help teachers break free from traditional teaching models and embrace technology-led best practices.

---

8 *Examining the connection between classroom technology and student engagement.* R. C. Morris and Loran Carleton Parker in the Journal of Teaching and Learning with Technology, Vol 3, No 1, June 2014 pp 1-15.

9 Ibid.

10 *Building Innovation: Learning with Technologies.* Kathryn Moyle, Australian Council for Educational Research (ACER), Australian Education Review, 2010.

11 *Enhancing Classroom Communication With Interactive Technology: How Faculty Can Get Started.* Jacqueline K. Eastman, Valdosta State University. College Teaching Methods & Styles Journal, First Quarter 2007.

12 *Enhancing Student Learning with Interactive Whiteboards: Perspectives of Teachers and Students.* Sue Gregory, University of New England, New South Wales, Australia. December 2010.

13 *Interactive instruction: Creating interactive learning environments through tomorrow's teachers.* Sessoms, D. (2008), International Journal of Technology in Teaching and Learning, 4(2), 86-96.

The value of an education technology ecosystem

Like the end-to-end technology ecosystems that are used in the business world, the hardware and software used for elevating education work best when they are part of a larger technology ecosystem.

Many of the world's largest technology companies are seeing value in developing technology that works in an ecosystem, where multiple platforms can easily talk to each other. This includes mobile devices and the software applications designed for them, interactive presentation screens such as LFTs, IP phones, networked projectors, and even internet-connected multifunction devices that print and scan.

With this ecosystem in place, students, teachers, and administrative staff have access to not only to the benefits provided by standalone devices, but also every other connected piece of hardware or software within the learning ecosystem.

How a technology ecosystem benefits key stakeholders in the education sector:

Students:

A standalone device for students to complete work or do research online is useful. However, the value of such a device is magnified if it can be used to contribute to a broader discussion or receive feedback from a teacher.

An ecosystem that supports open, two-way, communication and collaboration between teachers, students, and resources, takes the learning process to the next level.

Teachers:

An education technology ecosystem that includes multifunction printer/scanner devices as well as networked tablets and interactive screens in the classroom can help teachers do away with the hassle of hardcopy printouts. Instead, teachers can simply send the latest version of a document to students electronically as a class begins.

An ecosystem that integrates students' portable devices with digital learning platforms and interactive classroom-based display boards lets teaches drive student participation and overcome traditional barriers to participation.

For example, students can contribute to the class discussion anonymously if they lack the confidence to speak up. Teachers can quickly and easily share students' comments or feedback without requiring students to leave their seats.

Administrative staff:

Administrative staff perform time consuming duties that can depend on class or student information to be sent back from the teaching staff or students themselves.

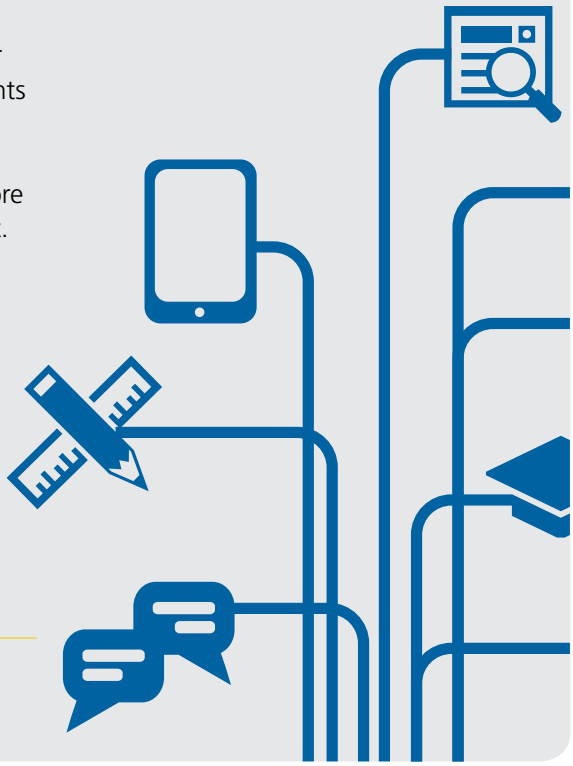
However, with an ecosystem that touches all facets of the institution's operation, the information needed for administrative tasks can be quickly and easily obtained, or even automated, saving time for everyone. Class attendance records, for example, can be recorded through mobile device log-in activity and feedback forms can be sent directly to students without requiring the teacher to act as an intermediary.

Adapting to change

While interactive technology can provide new ways in which to teach and learn, and the ecosystem underpinning such technology reduces traditional barriers, it is important for educators to understand that there is still a place for teacher-led instruction. The trick is to understand when to use that approach.

Much like an activity-led workplace approach, the classroom of the future must be flexible enough to allow for different types of interaction. Students need different environments for solo work, small group meetings, or online collaboration, as well as a more traditional instructional environment.

Creating spaces that can be used flexibly is a good start for schools looking to leverage technology to create an enriched learning environment.[14]



14 *Schools of the future must adjust to technology needs.* Stephen Heppell, Felipe Segovia Chair of Learning Innovation at Universidad Camilo José Cela, Madrid, and chair in New Media Environments at Bournemouth University. Sydney Morning Herald, 16 February 2015.

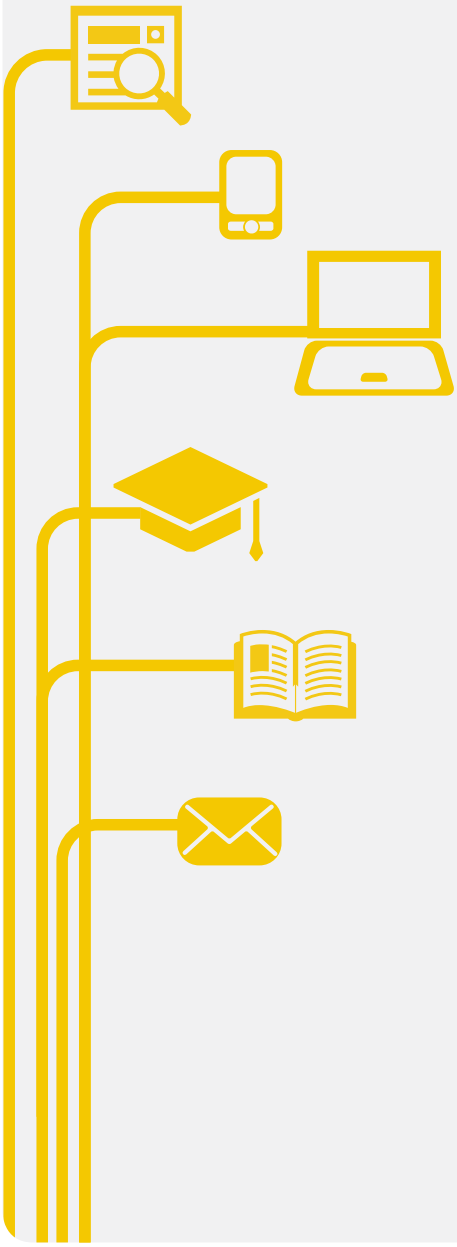
Ricoh's solutions for an education technology ecosystem

The best technology ecosystems are often those comprised of solutions designed by a single organisation to be integrated seamlessly with its entire solution portfolio. As a provider of products and solutions aimed at addressing a broad range of capabilities, Ricoh has developed a portfolio of solutions that can cover all the technology requirements in a comprehensive education ecosystem. Furthermore, from understanding your institution's practices to the implementation of a complete solution and beyond, Ricoh's team of education specialists are on hand to manage the entire process from the beginning.

Ricoh Connect & Collaborate

Ricoh Connect & Collaborate enables education institutions to simplify the management and support for their visual communications infrastructure, thanks to Ricoh's consistent future-focused solutions, global delivery and service network. Ricoh has developed Connect & Collaborate from its proven range of unique visual communications products, including video conferencing for distance learning, wireless and network projectors, large format touch screen LCD panel for collaboration and smart mobile technologies for activity based learning. Ricoh's fully interactive solutions take the teaching and learning concepts to the next level. This collaborative solution transforms the classroom into a powerful interactive learning environment for students and teachers alike. The solution can even digitally capture handwritten notes to retrieve and share later, helping teachers engage students while encouraging interaction and exchange ideas.

As part of Ricoh's service, all the communications equipment and infrastructure required to support fluent, productive collaboration among teachers and students, including Ricoh's unique, industry-leading hardware, software and services and integrating additional technologies. Ricoh can even provide a turn-key solution that includes furnishing meeting rooms with fixed video conferencing and visual communications equipment. As a result, Institutions can ensure they have the right tools in place to meet their specific visual communication needs while maintaining tight control over operating costs.



IT services

An education technology ecosystem needs the right IT solution to integrate various business systems. IT departments in all sectors depend on a reliable network with systems designed to cope with the growing demands placed on them including the security of information, and all its users. It is no different for learning centres.

Ricoh works closely with educational institutions to design information technology solutions that support their educational, administrative, and security objectives, providing the appropriate technology backbone needed to integrate numerous devices such as LFTs and students' tablets

Document Services

Ricoh's vision is to play a key role in transforming the education and learning experience for both students and faculty, and turning spaces – including Classrooms, Libraries, Lounges and legacy Print Rooms – into areas where employees and students alike can collaborate and develop their skills and experience. Our approach is based on Ricoh's adaptive model methodology and begins with a detailed audit linked to campus collaboration, document management and learning services. Getting the right information to the right person at the right time is fundamental to growth. Ricoh works with Institutions to optimise their infrastructure, apply print management technologies that eliminate waste and govern information, and adapt processes to make them more efficient and effective.

Print

With Ricoh's long history in print and document workflow systems, it is well-primed to provide the know-how and technology needed to help schools and universities transition from a print-heavy teaching environment to a multimedia information-sharing posture to better engage students.

Ricoh's print technology is a central key to the development of an end-to-end educational technology ecosystem that does not favour one medium over another, but can combine all potential media in a way that drives the greatest amount of engagement from students.

Conclusion

Implementing digital technology in educational institutions and training organisations is inevitable. Learning outcomes and student engagement levels benefit from technology like Ricoh's LFT solution, delivering a world-class learning environment. Organisations that hold off introducing these technologies are likely to suffer in comparison to savvier institutions.

It is, however, vital for educators to thoroughly understand the benefits and limitations of technology, and appreciate the ongoing necessity of good pedagogy. Teaching methods must change significantly to match the capabilities new technology can offer.

With much of the technology underpinning the educational ecosystem also used in the business world, using such solutions in schools, universities, and other training organisations also gives students knowledge and skills that remain relevant and useful.

Introducing new collaborative technology in classrooms doesn't have to be prohibitively complex or expensive. Market leaders like Ricoh offer affordable, flexible solutions that let educational institutions make strong inroads into the digital learning environment with minimal risk.

About Ricoh.

Ricoh is a global technology company specialising in office imaging equipment, production print solutions, document management systems and IT services. Headquartered in Tokyo, Ricoh Group operates in about 200 countries and regions. In the financial year ending March 2015, Ricoh Group had worldwide sales of 2,231 billion yen (approx. 18.5 billion USD).

The majority of the company's revenue comes from products, solutions and services that improve the interaction between people and information. Ricoh also produces award-winning digital cameras and specialised industrial products. It is known for the quality of its technology, the exceptional standard of its customer service and sustainability initiatives.

Under its corporate tagline, *imagine. change.* Ricoh helps companies transform the way they work and harness the collective imagination of their employees.

For further information, please visit **ricoh.com.au**

RICOH
imagine. change.

Ricoh Australia Pty. Ltd. 2 Richardson Place, North Ryde, NSW 2113. Phone: 13 RICOH (13 74264)