Abstract
We live in a world where our lives are being transformed almost daily by technology. In the once hallowed sanctuary of the lecture theatre, a faint hum can now be heard as students busily type notes on their tablet computers. This IT revolution is pounding at the door of higher education across the globe.

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As we stand on the edge of a new dawn, I want to consider the issues surrounding the introduction of technology and their impact on teaching and learning. There is little doubt that the last decade has seen a significant rise in the adoption of unsupervised learning. Students are now openly encouraged to independently research the topics they are studying.

Today, the information gathered from their tablet, laptop and smartphone is shared and discussed at length during a lecture or seminar. This trend looks set to continue.

Meeting expectations

Students arrive from secondary school where they are encouraged to embrace technology in an effort to prepare them for the working world. This, coupled with their open approach to social media, means that they have a far higher expectation of their chosen university.

High-speed access to information across campus should be regarded as a staple of every university. So too the concept of bringing your own device. This is opening up many more opportunities for teaching staff to inspire, excite and engage students.

However, it can pose a challenge for universities too. Engagement is critical to academic success. So, as academics, we need to remove any barriers that might prevent a student from excelling in their studies and encourage them to remain in higher education. Anytime, anywhere access to information fulfils the appetite of today’s generation of students who want to be able to search for content whenever and wherever they may be on campus.

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We encourage students to bring their own devices to university. I supervise a number of PhD students, for example, and it has become commonplace for them to power up their laptop or tablet during discussions. This allows us to go through the findings of an initial piece of research they have just completed quickly and easily. It saves students having to remember to print out the document or copy it to a USB memory stick. Students often remark that they prefer to access information from a single source using a familiar device, so it is important for us to meet this expectation.

**Leap of faith**

We must be mindful that although technology moves on apace, pedagogy does not necessarily follow suit. There are a vast array of devices and IT that enable us to engage with students in new and different ways.

However, the experiences of many in the higher education sector tell us that we must proceed with caution. Take the virtual learning environment Second Life, for example. During its formative years, many in the higher education sector eagerly embraced this virtual world of teaching and learning.

It took a considerable amount of time and effort for institutions to convert learning resources and adapt delivery methods to incorporate this into their provision. Yet once the system owners started to charge participants, it became a less financially viable option.

What resources such as Second Life have taught us is that we must take a conservative leap of faith and not adopt technology for technology’s sake. It is much more prudent to step back and think about what we are trying to achieve. The wider use of technology also raises the issue of who controls content. Handing students the freedom to roam the internet wherever they are on campus might be considered a given. But there is a clear need to balance this desire for instant access to information with the need to manage the reputation of the university.

Consider also whether a university should introduce the widespread use of tablets. Encouraging students to work using their personal device would allow greater interaction with staff, enabling them to instantly mark work and provide feedback. The move to a paperless system can improve communication and provide a single, central source in which all marked work can be stored.

But there’s a cost involved. Moreover, we cannot assume that all students will have access to this technology. Students work in different ways and we must embrace this difference to ensure engagement and, ultimately, academic success.
Rules and regulations

We must also remember that although student expectation and available finance may well influence the widespread adoption of technology, the British education system is also bound by law. In the United Kingdom, there is a far higher level of regulation compared to the United States, for example. There, academics have more freedom over the delivery of content than we do here.

But I believe there is a trade-off between regulation and freedom. Too much of the latter can lead to inconsistencies from one institution to another. And in the US, there is no quality assurance of courses delivered by universities. In the UK, there is a clear validation process that provides quality assurance across the sector.

Today we live in a world beset by change. Technology is having an impact on every aspect of society. In my view, the higher education sector must cautiously embrace change as this is essential to motivating and inspiring a new generation of students to achieve academic success.

Today, it is the internet that is the true heart of the modern university, and Google is the omniscient librarian. Google Books already out-ranks most of the world’s print collections and is busy scanning the rest of the estimated 129,864,880 print books that now exist on Earth.

As Steve Coffman, himself a university librarian, puts it: “It was a great ride while it lasted,” but now the time of the library as a research centre, with specialist staff who alone could unlock its secrets “has come and gone”.

People no longer use libraries shaped and curated by librarians. The generation entering universities today is more comfortable with digital than traditional sources of information. For them, the difference between an e-book and a real one is that it is only the former anyone still reads. And that the difference between an e-book and a website is that the latter is better.

Real books academics are relics

Real books have become relics, fit for glass cases, as in the British Library at St Pancras. And the changes could leave many professors in a similar situation. For centuries, academics have been defined by their books – both the ones they teach by and the ones that they write. But for students, an amorphous electronic mass of websites is already replacing core and set texts. The paper published in the prestigious journal Nature, purporting to show that entries by Wikipedia’s anonymous editors were as reliable as those of the Encyclopaedia Britannica’s subject experts is a straw in the wind in this respect.

The fact that Cambridge University Press’ recent book, Who’s Bigger: Where historical figures really rank, on the most ‘influential’ people in history (Jesus just
pips Napoleon), was written, not by historians, but by two United States computer specialists (Steven Skiena and Charles Ward) and relied heavily on the relative length of nearly a million Wikipedia entries, is another.

**Benefits vs pitfalls of online learning**

Free online courses have been seen as a way to „democratize” education by allowing more people in the developing world to gain access to expensive, ivory tower teaching and learning. On the other hand there are concerns that MOOCs may create an unequal global education system, in which most students in affluent countries will continue to receive face-to-face instruction while many students elsewhere take classes only on the internet. Instead of reducing inequality in higher education, MOOCs have the potential to “reconsolidate” it.

It is important to note that to date, MOOCs have been reported to be successful in affluent countries where they have been used to complement face-to-face teaching especially in distance education.

Many seem to agree that while we continue to uphold the benefits we must not forget the dangers and pitfalls of online learning, such as a possible reduction in the quality of learning and lack of access to the internet by students, especially in developing nations.

**Algorithms**

On the internet, instead of subject experts, information is presented according to esoteric algorithms which are quite novel. For Amazon, the best book on a topic is the one that has sold most copies in the last few weeks; for Google the best website is the one with the highest „PageRank”.

Precisely how either is determined is a secret, but scholarship doesn’t come into it. In the academic history world many have a sense of déjà vu. Articles in journals worry us not only about the future of the great library collections, vide Alexandria, but also about scholarship itself.

Yet what is there to do but accept change? One strategy, exemplified by Hull University’s Brynmor Jones Library (the one Philip Larkin used to run), is to literally throw out many of the old books and instead create “a state-of-the-art place of learning for generations to come”.

According to its website (of course), in the new library, you can:

“Bring your online life with you. Our wireless network will let you use your mobile device wherever you go in the BJL. You will have more PCs, more printers, and upgraded self-service facilities using RFID technology… Silent study? Innovative teaching? Group projects? There will be a space for however you like to
work… Meet friends for coffee in the new cafeteria, take in an exhibition, catch the stunning view from the seventh floor, or even host a black tie event.”

Hull should be complimented on seeing the future coming. As should Maurice Line, sometime director general of the British Library, who foresaw the end of the library, in an article for Ariadne web magazine as long ago as 1998. He warned: “All libraries are affected by IT. At the same time it both poses threats particularly that of being bypassed in favour of direct access, and offers opportunities. The ultimate threat is non-existence, which some think is a real prospect: public libraries because there are other priorities for funding and other opportunities for enlightenment and entertainment; academic libraries because students and researchers will soon be getting everything online.”

The journalist, Sonny Yap, once described the library as “perhaps the best antidote to the insidious influence of the suburban shopping mall… a chance to browse in a marketplace of ideas instead of a marketplace of goods and services”.

But even if it was once, these days the antidote is no longer effective. Far from it! Amazon, which is today where the world goes for books, has carefully applied the Walmart model to every stage of publishing.

Its founder, Jeff Bezos, is proud of revolutionizing the means of book production and distribution, yet the old mechanisms by which academics did have at least the ‘potential’ to spread ideas are also disappearing, replaced by a much more ruthless market in intellectual property.

For the academic presses, the kind of books they can do has changed. The change is one way – from ‘trade’ towards reading lists. So the place of the presses and academic authors alike in intellectual and cultural life is shrinking, taken by attractively packaged, gossipy books from trade presses, who ‘pile ‘em high and sell ‘em cheap’.

Academic publishers used to take hardback library sales for granted, university bookshops were a big part of the equation, and so too were the big town centre bookstores. But now libraries are history and bookstores are a shadow of what they used to be.

The biggest losers are academic authors with books that, in the past, would have sold to many more than the set-reading-list people. These authors can’t sell to browsing readers because the stores do not carry a wide range of books, and indeed the readers are not entering the stores looking for them.

The Amazon revolution

It happened so fast, we hardly noticed. In 1995, the year Jeff Bezos, then 31, started Amazon, just 16 million people used the internet. Today, almost one out of
every four humans on the planet are online. In sum, the bookstore wars are long over, and Amazon won. Rarely do students and academics buy their books from the curated collections that were university bookshops; they buy them online where margins are shaved and prices are cheaper.

Where once university presses earnestly solicited academics for their research projects, promising readers' reports, copyediting and fastidious proof checking, now even the giant, transnational presses – like Taylor & Francis and Wiley-Blackwell – have had to drastically rethink their assumptions about profits from such books, in the absence of library sales, shrinking university bookshops and a public culture of book browsing for free on the internet.

Actually, we are not saying the changes are all black and white (that old ways are all good and new ways all bad), but they are profound and “out of control”. No one planned or thought through the change to what is rapidly becoming a “world without books”. And that we should be sceptical of talk of new forms of writing, new forms of learning – market forces normally result in the emergence of a few brands at the expense of choice and diversity.

The great thing about books, unlike, say TV, was that for any topic, there was always a choice. A choice between producers (authors and publishers) as well as a choice between products. The internet, for all its vastness, has a tendency towards monopoly and centralised control, the antithesis of the conditions in which learning and education can flourish.

REFERENCES