



Richard Naish

About the future

A few things we should know about where we may go next

It's not often you meet someone who calls himself a futurist, but Chris Barnatt, Associate Professor of Computing and Future Studies at the University of Nottingham, is one such person. His book *25 Things We Should Know About The Future* comes out on 19th January 2012 and is a follow up to his well-received *Brief Guide to Cloud Computing*. But what is the potential impact for the technology-based learning industry in 5-10 years time?

His theme 'The end of the age of plenty', is characterised by the planet's population increasing dramatically at the same time as we run out of oil, water and other natural resources. So a first observation is that rather than using oil-based transport to travel large distances to attend training courses, a more efficient use of resources is likely to be local-delivered face-to-face training or technology-based training.

However, a more positive theme is 'The next industrial wave', where new high-tech solutions give us hope that we can 'do more with less'. For example, three-dimensional printing means that a solid object can be 'printed' from a computer file, using a printer that sprays material to form a solid shape. So if you want to show a product to someone on the other side of the world, you can email them your 3D file and they print it out at their end using their 3D printer. This technique could change product training dramatically; the learner can also learn by handling the product itself. There are also 3D printers that can print in metal, so it is currently possible to print out a working battery from a 3D file. Soon you will be able to print out a working gearbox.

The changes to computing that will affect the industry are: cloud computing, quantum computing, artificial intelligence and augmented reality.

The e-learning industry has enthusiastically embraced cloud computing and has come up with ingenious ways to get round the often poor bandwidth issues that can prevent the learner having

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a rich media experience. However, quantum computing is about giving us a massive increase in computer processing power.

In May 2011 Lockheed Martin bought a \$10m D-Wave computer that uses the science of quantum physics to work. Its additional processing power means that learning applications will no longer be limited by the existing processing power of modern PCs and will be able to provide more advanced functions such as augmented reality and artificial intelligence. Access to such computers in 5-10 years is likely to be via cloud services rather than 'a quantum computer in every home'.

Artificial intelligence (AI) has been worrying us ever since a computer called HAL made up its own mind that it was the appropriate action to kill crew members in Stanley Kubrick's film '2001: A Space Odyssey'. So it is a relief that the AI personal assistant, Siri, that comes with the new Apple iPhone 4S is far more benign. That said, he does get a bit tetchy if you keep asking him about HAL, his evil predecessor. With Siri, people can use more natural human speech instead of having to use specific pre-set phrases to get the computer to perform tasks. So instead of asking 'what is today's weather forecast?', you can ask the more practical question of 'Do I need to bring an umbrella today?' and get a sensible answer. AI delivered by the power of quantum computing has great potential to improve the support and learning for software users. The learner could ask questions like 'what am I meant to do now?' and

get helpful replies. And if learners have a webcam, the programme could also start interpreting their facial expressions and offer help when they start to look confused.

Augmented reality (AR) is where the normal view of the world through a human eye is supplemented with additional information supplied by computing devices. AR also has great potential as a learning tool. BMW research labs are designing a system where engineers fix your car while wearing special eyeglasses that can recognise what part of the engine they are looking at and then display overlay diagrams on the inside of their glasses. These overlays show them how to disassemble the part and which tool to use and the earpiece on the glasses also gives audio tips on the processes being performed. In the future, learning how to do something new will be just a matter of downloading the AR information to your glasses so the computer can 'see' what you are doing and tell you how to work through a new process or technique. If it is also combined with AI, you could also have a natural dialogue with your glasses when you don't understand something.

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25 Things You Need to Know About the Future by Christopher Barnatt is published 19 January 2012 by Constable & Robinson, London. For more, see www.explainingthefuture.com