How has technology influenced the education sector?

Paul Wappett, CEO, Open Universities Australia
Australian Tertiary Education Technology Outlook

2008
- Virtual Worlds
- Cloud-Based Applications
- Geolocation
- Deep Tagging
- Alternative Input Devices

2009
- Mobile Internet Devices
- Private Clouds
- Open Content
- Location-Based Learning

2010
- Electronic Books
- Mobiles
- Augmented Reality
- Game-Based Computing
- Visual Data Analysis

2012
- Cloud Computing
- Learning Analytics
- Mobile Apps
- Tablet Computing

2013
- Learning Analytics
- Mobile Learning
- Massively Open Online Courses
- Social Media
Near-Term Horizon: One Year or Less
Learning Analytics
Mobile Learning
Massively Open Online Courses
Social Media

Mid-Term Horizon: Two to Three years
3D Printing
Information Visualization
Location-Based Services
Open Badges

Long-Term Horizon: Four to Five years
Flexible Displays
The Internet of Things
Virtual and Remote Laboratories
Wearable Technology
#1 Learning Analytics

*Trends Impacting Technology Decisions*

There is a growing interest in using new sources of data for personalising the learning experience and for performance measure.

*Most Significant Challenges*

The demand for personalised learning is not adequately supported by current technology or practices.
Personalised learning

**Tools**
- Desktop, Tablet, Mobile
- Tele-/Video conferencing
- Social media

**Individuals**
- Objectives
- Prior knowledge
- Competencies
- Life and work skills
- Motivation

**Spaces**
- University
- Home (office)
- Cafes
- Transport

**Content**
- Competencies rather than input
- Learning challenges rather than learning objectives
- Learning pathways instead of static curriculum

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Linear model – static curriculum and single learning path

- **Student A**:
  - Week 1: Lecture, Tutorial
  - Week 2: Lecture, Tutorial
  - Week 3: Lecture
  - Week 4: Lecture
  - Week 5: Lecture
  - Week 6: Lecture
  - Week 7: Lecture
  - Week 8: Lecture
  - Week 9: Lecture
  - Week 10: Lecture
  - Week 11: Lecture
  - Week 12: Lecture

- **Student B**:
  - Week 1: Lecture, Tutorial
  - Week 2: Lecture
  - Week 3: Lecture
  - Week 4: Lecture
  - Week 5: Lecture
  - Week 6: Lecture
  - Week 7: Lecture
  - Week 8: Lecture
  - Week 9: Lecture
  - Week 10: Lecture
  - Week 11: Lecture
  - Week 12: Lecture

- **Exams**:
  - **Pass Exam**: Student A
  - **Fail Exam**: Student B

**Notes**:
- Demonstrated knowledge in module
- Failed to demonstrate knowledge in module

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Australia
Dynamic model – personalised and adaptive learning path
PASS - Personalised Adaptive Study Success

INDIVIDUAL CHARACTERISTICS
- Prior knowledge
- Interest
- Motivation
- Online skills
- Socio-demographic data
- Competencies

SOCIAL WEB
- Peer influence
- Peer interaction
- Preferences

PHYSICAL DATA
- Emotional status
- Experiences
- Health
- Location

PERSONAL ONLINE LEARNING ENVIRONMENT
- Learning path
- Behaviour
- Discussion
- Content
- Performance
- Evaluation

LEARNING ANALYTICS ENGINE
- Data mining
- Semantic processing
- Comparison
- Validation
- Prediction

PERSONALISATION AND ADAPTATION ENGINE
- Dashboard
- Prompting
- Visualisation
- Scaffolding
- Feedback
- Recommendation
- Gamification

CURRICULUM
- Needs analysis
- Requirements
- Learning challenges
- Sequencing
- Design
- Assessment
- Evaluation

REPORTING ENGINE
- Dashboard
- Organisation
- Learning design
- Teacher / tutor
- Student

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Many research studies have clearly demonstrated the importance of cognitive structures as the building blocks of meaningful learning and retention of instructional materials. Identifying the learners' cognitive structures will help instructors to organize materials, identify knowledge gaps, and relate new materials to existing slots or anchors within the learners' cognitive structures. The purpose of our empirical investigation is to track the development of cognitive structures over time. Accordingly, we demonstrate how various indicators …
#2 Mobile Learning

*Trends Impacting Technology Decisions*

People expect to be able to work, learn and study whenever and wherever they want

*Most Significant Challenges*

Too often it is education’s own processes, practices and key individuals that limit broader uptake of new technologies
Mobile learning is evolving

- Community
- Apps
- Augmented
- Access
- Social media
- Authentic
- Gamification
- Cloud
- Location
Acceptance of mobile learning

In the context of learning and instruction I am quite critical about the use of mobile devices.

First of all I have to choose appropriate applications ... with 400,000 apps, it is difficult to keep an overview.

Positive. I think the students are excited ... the more variety in learning the more students are able to engage.

I hope that the quality of learning and instruction reaches a higher level... Yes, I expect it.
#3 Social Media

Trends Impacting Technology Decisions

Social media is changing the way people interact, present ideas and information, and judge the quality of content and contributions.

Most Significant Challenges

Faculty training and attitudes still do not acknowledge the fact that digital media literacy continues its rise in importance as a key skill in every discipline and profession.
Social media for building learning communities
Social media

- Importance of digital media literacy
- Training in the supporting skills and techniques is rare or non-existent
- Digital media literacy is less about tools and more about thinking
#4 Massive Open Online Courses

*Trends Impacting Technology Decisions*

MOOCs are being widely explored as alternatives and supplements to traditional university courses

*Most Significant Challenges*

New models of education are bringing unprecedented competition to the traditional models of tertiary education
Massive open online courses (MOOCs) offer course content all over the web at no cost. They do not have specific requirements and can attract from few hundred to several thousand learners. Classrooms often serve as hubs for social media interaction.
Production values

Podcast

Video

Udacity

Open2Study

Lower production values/student engagement

Higher production values/student engagement

PDF

Webcam

Khan Academy

Coursera
A subject…

Consists of 4 modules (weeks)

Each module has 1 hour of video

Each topic video has 1 MC quiz
What do we learn from the Technology Outlook for Australian Tertiary Education 2013 - 2018?

- Focus on recommendations to help the higher education sector prepare for, and harness new and emerging technologies
How has technology influenced the education sector?

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