Emerging Trends in Technology Applied to Academia and Education

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Drivers and trends

Opening learning and access
The need for continuous and LLL
Globalisation and mobility
Competing for students and funds
Integration with businesses
ICT and other technologies
• Mobile technology and devices
• LMS, course authoring and management systems
• Digital content repositories and services
• Social software
• Semantic and language technologies

• Cloud computing
• Augmented reality
• Artificial Intelligence (from analytics to companions)
• Smart environments and sensor networks (IoT, FI)

• 3D printing
• Intelligent/cognitive devices and embedded systems
• Nanotechnology
Technology is there I
Increasing market

- „691,000 students in the US, with an annual value estimated at around $20bn“. (BBC News)
- „340,000 students taking UK university courses in their home countries“. (Irish Times)
- „Indian public opinion was outraged after a series of attacks on Indian students in Australia in 2009. Applications from Indian students slumped by 50% - and threatened an industry which had grown to become Australia's third biggest export“. (Australian Technology Network)
• „The number of students around the globe enrolled in higher education is forecast to more than double to 262 million by 2025“. (University World News)

• „The number of students seeking study abroad from China and India alone could rise to 8 million – nearly three times more than today.“ (University World News)

• „The total number of universities in the world are counted to 17036“. (According to International Journal of Scientometrics, infometrics and bibliometrics)
The countries which play host to the most international students in absolute terms are:

- United States (18%),
- United Kingdom (10%),
- Australia (7%),
- Germany (7%),
- France (7%),
- Canada (5%),
- Japan (4%),
- Russia (4%), and
- Spain (2%)
Peers (Chronicle)
University hotspots - geographical distribution of highest impact institutions, 2009

Location of top-50 universities by main subject areas

Big players understand the market potential
Big players understand the market potential
Big players understand the market potential

<table>
<thead>
<tr>
<th>Company</th>
<th># of Partners</th>
<th>Non-Profit</th>
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<tbody>
<tr>
<td>Embanet-Compass</td>
<td>35</td>
<td>Boston University</td>
</tr>
<tr>
<td>Deltak</td>
<td>26</td>
<td>Purdue University</td>
</tr>
<tr>
<td>Academic Partnerships</td>
<td>14</td>
<td>FIU Florida International University</td>
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<tr>
<td>Bisk</td>
<td>12</td>
<td>University of Notre Dame</td>
</tr>
<tr>
<td>Pearson</td>
<td>10</td>
<td>Arizona State University</td>
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<tr>
<td>Educators Serving Educators</td>
<td>7</td>
<td>American International College</td>
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<td>Learning House</td>
<td>5</td>
<td>Albany State University</td>
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<tr>
<td>Colloquy</td>
<td>4</td>
<td>George Mason University</td>
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<td>USC University of Southern California</td>
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<td>Altius Ed</td>
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<td>Tiffin University</td>
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Figure 3: Which Universities Use Enablers?

- 4+ Million students since inception
- 300,000 Facebook fans, growing daily
- 110 Million online assessments since inception
- Statistics as of January 2012

10,000 Academies
165 Countries

100% of Worldwide Total
1,000 Number of Students in Thousands
1% 183
6% 63
7% 49
18% 189
14% 18
6% 77
5% 7
2% 23
1% 1
9% 171
17% 17
19% 6
8% 7

Communication
Big players understand the market potential
What is out there?

- Large scale reasoning
- Cognitive systems
- Interoperability models and solutions
- Self-awareness
- Language technologies
- Semantic and Context technologies
- Machine learning
- Multimodal interfaces
- Information retrieval
- Knowledge discovery
- Ubiquitous sensing
- Data collection and storage
- Internet of things (everything)
Mass data
Multimodal data
Some meta-information
Is it accurate?

Where to look?

How to cope with all the news?

How to file and categorize it?

How to select and filter?

What to do with it?
How do I find the right information?

Is it accurate?

Where to look?

Never have so many people written so much to be read by so few…”
- Katie Hafner

How to select it?

How to file and categorize it?

How do I find the right information?
Returning back to teaching - “blended approach”

- **Learning**
  - Technology driven
  - Self-learning
  - Open access

- **Teaching**
  - Does not work only with ICT
  - instructors engage in dialogue, develop critical thinking skills and spark passion about a discipline.
• The generations that are comming are different – ICT, videos, interactive games are embeeded in their mental models
• Serendipity: rapid development of new technologies
• Mass content, information
• Networking as a fundamental mechanism

• Learning machines
• It is not about competition it is about collaboration

We are ignoring...
The future of learning is...
The future of learning is...

- open
- social
- personal
- augmented
- mobile
- visual

Collaborative

Academia
### Status Quo

#### Customers
- Domestic students
- International students
- Industry

#### Product offerings
- Vocational and further education and training
- Higher education
- Research
- Arts
- Engineering
- Science
- Business
- Medicine/health
- Law
- IT
- Design
- Other
- Other
- Other
- Other

#### Education disciplines
- Schools
- Open days
- Agents
- Road-shows
- Digital
- Other
- Other

#### Sales
- On campus
- Digital
- Partnerships

#### Delivery
- Student administration
- Career centre
- Other
- Other
- Other

#### Student services
- HR
- IT
- Finance
- Legal
- Other

#### Back office
- Other

Source: Ernst & Young
### Customers
- Domestic students
- International students
- Industry professionals
- Other education providers
  - School leavers
  - Mature age
  - High-end
  - Mass market
  - B2B
  - Executive education
  - Parents
  - Content wholesalers
  - Content consumers
  - Service providers

### Product offerings
- Vocational and further education and training
- Higher education
- Research
- Mass distribution
- Entertainment
- Financial services
- Other

### Sales
- Other
- Digital

### Delivery
- Digital
- Partnerships

### Student services
- Student administration, career services, other (outsourced)
- Customer relationship management (cloud)
- Outsourced

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*Source: Ernst & Young*
The war of titans (network and globalisation)
  ◦ What is there for small nations, 3rd world countries?

New systems – old paradigms

Loosing quality by inflated programs
  ◦ Academia is not an industry

Polarisation:
  ◦ “Louis Vuitton on Fifth Avenue” type of universities at one side
  ◦ “Wal Mart” type universities at the other
  ◦ ... and nothing in between

Cross-accreditation is still a political incentive
  ◦ Bologna refform in Europe
“Other institutions will look at edX certificates – which, after all, are based on courses developed by Harvard, MIT and Berkeley – and say they might accept them as credit towards a course of study.” (Listener)

The ideal behind MOOCs courses is "the promise of scaling a university education to everyone... well everyone with an Internet connection, that is." (Hack Education)
• Open access, open knowledge, open education
  ◦ Videolectures.net
• SCI video scientific journal
  ◦ 2 scientific journal in operation
• Virtual scientific conferences
• Virtual Universities

• Web 2.5 for learning
• Innovation tube – entering businesses

K4A foundation