Panel: Visions of the Future – Knowledge and Education 10 years from Now

Moderator:
Stephen White, University of Huddersfield, UK

Panelists:
Murtuza Ali Lakhani, Silicon Valley Scientist, USA
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22nd – 27th February 2015, Lisbon, Portugal
The Seventh International Conference on Mobile, Hybrid, and On-line Learning eLmL 2015
The Seventh International Conference on Information, Process, and Knowledge Management eKNOW 2015
Siri.
Your wish is its command.

Skyvi
Talk to Your Internet.
Learning Analytics
Panel: Visions of the Future – Knowledge and Education 10 years from Now

Over to the Panel...

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Images

Crystal ball in hand: [https://www.flickr.com/photos/valeriebb/3488188022/](https://www.flickr.com/photos/valeriebb/3488188022/)
2015 Calendar: [https://openclipart.org/image/300px/svg_to_png/202454/calendar-2015.png](https://openclipart.org/image/300px/svg_to_png/202454/calendar-2015.png)
Back to the Future Glasses: [http://img.gawkerassets.com/img/17kac0czf875jpg/original.jpg](http://img.gawkerassets.com/img/17kac0czf875jpg/original.jpg)
THE FUTURE
NEXT EXIT
EXIT 03
Interconnected Ecosystems

**DRIVERS**

Technology Changes
Globalization

Education/Learning
Industry
Society
Knowledge Creation (KC)
Sense of Community (SoC) -> Influence

Emotional Connection

Group Membership

Needs Fulfillment

Knowledge Creation (KC)
Knowledge Creation (KC)
Sense of Community (SoC)
Needs Fulfillment
Influence

Email

Text/Instant Messaging
Asynchronous (Blogs, social networking, online forums)

Telecommuting

Face-to-Face

Video Technologies
3D and Tactile (Haptic) Systems in Future Education

Felix Hamza-Lup, Ph.D.
Input/Output - Communication Channels

• 5 senses (or maybe more ...)
  • I hear (hearing), I see (vision), I do (haptic), taste, smell
  • Input: all 5
  • Output: tactile, auditory and olfactory stimuli

• History of Artificial Stimuli:
  1. Sounds (1900s – Nikola Tesla - Radio)
  2. Vision - Remote Vision (Tele+Visor)
     ➢ No sound, black/white, 2D
     ➢ + Color
     ➢ + 3D – Widespread by 2015
  3. Touch (Haptics) – 2010 (fast growth)
  4. Taste – do we want to simulate this?
  5. Smell – this is possible, interesting to explore?
Multimodal Interaction

• **Learning** is about **Knowledge** transfer:
  • People must learn more today than 50, even 10 years ago (specially in technical fields)
  • Same main methods for teaching & learning:
    • concept understanding
    • some level of memorization
    • “I hear and I forget. I see and I remember. I do and I understand” – Confucius

• Knowledge transfer occurs through (social) **interaction**
  • Engagement
  • Immediate feedback (Interactive speed ... seconds)
  • Real-world contexts (relate to real world contexts)
Reality-Virtuality Continuum

Mixed Reality

50%

Real  Augmented Reality (AR)  Augmented Virtuality (AV)  Virtual (VR)

Reality - Virtuality (RV) Continuum*

(*) Milgram, Takemura, Utsumi, Kishino. “Augmented Reality: A class of displays on the reality-virtuality continuum”
Haptic Interaction
One point of interaction – reference point – a linkage-based system

- Robotic arm that tracks position and orientation of user’s hand
- Updates position and orientation information every ms (1KHz)
- Visual representation of physical reference point within virtual application.

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X3D/Haptic Prototype Systems for Education

- X3D (Web 3D)
  - Engineering Education
    http://projects.felixlup.net/view/
  - Medical Education
    http://3drtt.org/
    http://neuro-pathways.projects.felixlup.net/
  - City Planning & Education
    http://projects.felixlup.net/s3d/S3D.x3db

- Haptic & X3D:
  - Framework for Electronic Enhancement of Laboratories (FEEL)
    http://projects.felixlup.net/feel/index.html
  - Haptic Environments for K12-16
    http://projects.felixlup.net/haptek16/


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