Learning for Life

Grand Challenges for Computer Research (GC 8)

The Open University

Dr. Jan Rae
Institute of Educational Technology
The Open University

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Chair of GC8 Steering Committee

- Josie Taylor
  Professor of Learning Technology,
  Institute of Educational Technology,
  The Open University

The big idea

- The idea of the grand challenge is to re-engage computer scientists to drive progress towards computing machinery and devices, networks, software that are actually up to the job so that every learner who wants to learn can learn what they want, in the way they want, whoever they are, wherever they are in the world, and whatever their age or literacy level … (Taylor)

Why and how

- The challenge is to conceptualise learning environments and understand how people will engage with learning, and what learning for life will be like.
- Clearly this is a highly interdisciplinary initiative, involving computer science, learning sciences and social sciences. (Taylor)

Background to the Learning for Life challenge

- Consulted with a cross section of the UK academic community.
- To explore and illuminate e-learning research priorities.
- Held an interdisciplinary workshop at Bletchley Park, June 2004.
- Which supported an initial articulation of the Learning for Life agenda.

The Learning for Life Grand Challenge proposal

- Those involved in the consultation to create the proposal included:
  - A cross section of the UK Academic community
  - funding agencies and government departments: EPSRC, ESRC, E Science, JISC, BECTA, HEFCE, DfES.
- The articulation of the challenge - supported and steered by a broadly constituted consultation panel

The Learning for Life challenge -

- With mobile and ubiquitous computing, the semantic web and an e-research infrastructure, new possibilities open up for e-learning and learning for life that take us beyond what has been conceived in this area before.
- New possibilities need to be understood in the context of our developing understanding of the co-evolutionary nature of learning and computing systems.
- This is our challenge.

Themes:

- ***Modelling and Dynamic evaluation***

- How do we best model and represent learners within e-learning facilities and how might we assess these over time?

Themes:

- ***Informal and Lifelong Learning***

- How might we develop facilities that support learning outside formal educational settings over a learner's lifetime?

Themes:

- ***Creativity and Problem Solving***

- How might we encourage and support creativity and problems solving with and through e-learning facilities?

Themes:

- ***Inclusion and Accessibility***

- How do we ensure that learning for life is a viable option for all, and that the facilities provided reflect the diversity of learners?

Underpinning these themes are ***two multidisciplinary challenges*** in e-learning

- ***Technological challenges***
  - How do we exploit the potential that emerges from new technological advances to best support learning for life?
- ***Economic, Social and Cultural challenges***
  - How do we ensure that the benefits to emerge from e-learning are exploited to their best potential and how do we best understand and manage the social and cultural impact of e-learning research and practice?

New Horizons – new technologies

- Can support new forms of teaching, learning and creative expression, through e.g.
  - Collaboration webs
  - Mobile broadband
  - Data mashups
  - Collective intelligence
  - Social operating systems
    (The Horizon Report 2008 Edition)

Characteristics of the challenge

- **Scientific curiosity**
  - a revolutionary approach to the understanding of people engaged in learning
- **Engineering ambition**
  - building possibilities for Learning for Life that have never been seen before
- **Research community support**
  - representing the concerns of over 200 researchers
- **International scope**
  - recognising, harnessing, exploiting and exporting talent

Characteristics of the challenge

- **Captures the imagination**
  - general public and scientific community experience e-learning maturity
- **Goes beyond what is initially possible**
  - creating new understanding, techniques and tools
- **Real benefits**
  - scientific, learning and economic
- **Leads to radical paradigm shift**
  - move forward from dubious assumptions about e-learning

BCS Grand Challenges Workshops – March 2008

- Learning for Life workshop well attended, but not representative of a range of science disciplines
- Included thinking related to:
  - Social inclusion; accessibility; older learners
  - Work-based learning; modelling learners
  - Informal learning; engagement
  - Standards; constructive meaning making
  - Openness; feedback; teaching; profound empthy

Reflection on the workshop

- **Insufficient representation from the computer science community**
  - Need to clarify barriers to your involvement
- **The challenge demands interdisciplinarity**
  - The challenge requires active participation and negotiation to take place across disciplinary boundaries in order to arrive at shared representations of significant milestones for this challenge, i.e. appropriate engagement with computational thinking (Bundy, Wing etc.)

Reflection on the workshop

- **What is at stake?**
  - The opportunity to determine positively directed action set in a framework of jointly considered requirements.
  - A utopian realisation of technological promise coupled with hitherto unrealised opportunities for human learning potential to flourish (Taylor, Cliff et al)

Barriers to interdisciplinarity

- Disciplinary integrity and the conundrums of cross-cultural communication (Sillitoe)
- Cultures, methods, languages, trust and respect, institutional impedimenta, professional impedimenta (Brewer)

Ways of progressing the challenge

- Orchestrating interdisciplinary groups
  - Charismatic or Heuristic (Lengwiler)
- Developing shared terms
- Achieving joint publication of a roadmap
- Permeating computational thinking across disciplines
- Supporting validation strategies for e-learning platforms

2009 - Invigorating the challenge

- 2009 will involve more meetings – more effort and determination focused on moving the challenge forward
  - Josie Taylor (Open University)
  - Hugh Davis (Southampton University)
  - Mike Sharples (Nottingham University)
  - Tom Boyle (London Metropolitan University)
- Meeting in the new year - planning a new series of events and ways and means of involving the computer science community in the realisation of Learning for Life

Finally – posing success criteria for the challenge

- When all computers, whatever their form, can talk to all others through communication channels that let people pursue their interests and goals without obstacles.
- When all computers can talk with all other computers without the use of cables – organising themselves into sensible networks.
- And when educational institutions exist solely for their social function.

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Institute of Educational Technology
The Open University
Walton Hall
Milton Keynes
MK7 6AA

http://www.open.ac.uk/iet
http://ukgrandchallenge8.open.ac.uk/