The Cyber Security Knowledge Exchange: Working with Employers to produce authentic PBL scenarios and enhance employability.

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Agenda

1. Context
2. CSKE Aims
3. PBL Scenarios
4. Knowledge Exchange Placements
5. Engaging with Employers
6. PBL/ Consulting Model
7. Lessons Learned
Context

• Cybersecurity: the problem – why bother?
• UK faces devastating cyber security skills crisis
• Cyber Security Ranked Third in Lloyd’s of London Risk Index
• SMEs are putting a third of their revenue at risk
Sources of malicious Spam
Jul-Sept 2015

- USA, 15.34%
- Vietnam, 8.42%
- China, 7.15%
- Russia, 5.79%
- Germany, 4.39%
- France, 3.32%
- India, 3.10%
- Brazil, 2.81%
- Argentina, 2.77%
- Japan, 2.41%
- Ukraine, 2.40%
- Turkey, 2.18%
- Mexico, 2.06%
- Great Britain, 2.01%
- Netherlands, 1.93%
- Spain, 1.84%
- Romania, 1.74%
- South Korea, 1.78%
- Indonesia, 1.19%
- Other countries, 25.73%
Cybersecurity: aims of the Edge Hill project

Responds directly to the UK government’s National Cyber Strategy by:

- Creating widely available **leading-edge educational resources** for industry and HE which **develop employability**
- Increasing **SMEs’ cybersecurity expertise**.
- Increasing the **supply and expertise of graduates**.
- Maximising **impact** through active dissemination/promotion
Cybersecurity: components of the project

- **PBL scenarios:**
  - Flexible and re-usable Cyber-security scenarios aligned with current best practice. Developed with Industry partners.

- **MOOC**

- **Knowledge Exchange**
  - MSc InfoSec Students undertake activities to promote Cyber-Security during a placement within an SME.

- **Model of Engagement**
  - the evidence-based model, derived from evaluation, enables other HEIs to adopt or adapt it.
How does PBL develop Employability?

**People related skills:** Communication, Interpersonal, influencing, Negotiation, Team-working, Leadership, Business & customer awareness

**Conceptualising / thinking skills:** Managing information, Problem solving, Planning & organization, Learning skills, Thinking innovatively & creatively, Reflective skills

**Skills related to the community:** Citizenship skills

**Personal skills & attributes:** Professionalism and Ethical behaviour, Enthusiasm & positive attitude, Adaptability, Motivation, Reliability, Responsibility, Honesty, Resourcefulness / Determination, Commitment, Flexibility, Time management and working under pressure
Cybersecurity: progress to date

- 9 paper based PBL Scenarios in Draft form
- TEL resources for 6 created
- 3 x SME placements identified, 2 completed
  - Risk Assessment x 2; Penetration test
- MOOC created
- Project web site: www.cske.org.uk
The CSKE Model:

- Employers,
- Integrating PBL
- and Placements
PBL Scenario development

- Recruit industry partners
- Workshop to elicit knowledge for scenario
- Create paper scenario, facilitator guide + resources.
- Students develop scripts, video & TEL resources.
- Guided by TEL developer
Examples

www.cske.org.uk
The CSKE Model:

- Employers,
- Integrating PBL
- and Placements
Knowledge Transfer Model

- Recruit SMEs
- Initial visit to scope the work (student/ Academic/ Project Manager)
- Project overview + contract
- 2 x Students 10 days placement
- Deliverables - handover
E.g. Lancaster based SME

- XXX train teachers to deliver literacy teaching using phonics. The company has expanded rapidly over the last 18 months, now delivering in 17 states within Nigeria together with numerous other African states and India

- Share data in Dropbox
- No policies/ security controls
- Laptops/ mobiles/ tablets
- Risk assessment required
- Recommendations
Originally an alternative to PBL scenarios,

Pedagogy of MOOCs…

- Transmission model
- Individual
- MCQ assessment
- Not messy, collaborative, or alternative solutions

- PBL & MOOC don’t mix
Lessons learned and future potential

Students’ confidence:
1. Professionalism
2. Learning skills/knowledge
3. Creativity
4. Reliability
5. Ownership

..and value as partners
Evaluation of Edge Hill Cybersecurity project

Main outcomes
- MOOC
- User and workshop guides
- PBL Scenarios
- New and improved partnerships
- Learning and Teaching model
- Knowledge Exchange Model
- Updates to MSc

Main impact
- Students' professional development
- CyberSecurity placements with SMEs
- Project team development
- Use by SMEs
- Adoption of resources by other institutions
- Use of model(s) by other institutions

Project delivered on...
- Effective CyberSecurity placements

Plans for embedding and sustainability
- Basis for further HEA project
- Further development of MSc
- Template for further scenarios
- MOOC

Main issues and resolutions
- Developing student skills
- Responding to changes in environment
- Identifying most relevant scenarios
- Project timescale and expectations
- Access to SMEs
- Technical platform

Edition
Evaluation overview v3 This map summarises progress on the main project outcomes at end of January 2016
Successes

► Effective collaboration across roles (academics, technologists etc.)
► Increasing student engagement and involvement in curriculum development.
► Curriculum model encourages student exploration and creativity.
► Flexible curriculum model so we can extend the application.
  ► Cater for current and likely mobile environments.
Difficulties: working with industry partners

- Challenging in timescale
- Knowledge elicitation was difficult,
  - Different partner perspectives and expectations
  - Differing levels of knowledge of the proposed cases
- Some scenarios not possible. Alternatives created through follow-up meetings with partners.

Lesson: Specify more fully in advance with partner and further discussion with prospective partners to clarify their expectations and assumptions
Difficulties: limited response from SMEs

- The response from SMEs has not been as strong as we expected
  - seems to be due to the economic pressures they are facing and the complexity of the sector.

- Lesson: Need to spend more time building relationships with SMEs in the next stages of the project
Difficulties: Flexibility of PBL scenarios

- Draft PBL scenarios were not in consistent format, reflecting the variety of situations and different partner perspectives.

- Lesson: A more detailed learning model had to be developed by the project team.
  - now been applied to the PBL scenarios to ensure both consistency and flexibility.
Summary: How does it stack up?

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Questions, Comments, Insults?

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Help spread the word!

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