

CPHC LDG Enterprise & Entrepreneurship in the Computing Curriculum
Total length should not exceed 4 pages, 2-3 pages preferred

Digital Markets
Edinburgh Napier University
Tom McEwan
t.mcewan@napier.ac.uk

<http://www.modules.napier.ac.uk/Module.aspx?ID=IMD11108>

Where does the course fit in your curriculum?

This is a masters-level module taken by students on different one-year MSc courses (some compulsory, some optional) and compulsory for students in the final year of integrated masters. There are no prerequisites and it does not lead to any other courses, and has run twice for 7 and 8 students respectively.

What is covered in the course?

The module simulates a contemporary commercial innovation cycle for Digital Media. The module has a non-traditional contact pattern, emulating the nature of innovation for the digital marketplace.

The first few weeks provide a wide range of underpinning in human issues in technology innovation models - from Griliches (1957) through Gaines & Shaw (1986) and Moore (1999) to the current approaches in design innovation discussed by the Directorate General for Enterprise and Industry of the European Commission and euset.eu. The middle weeks involve lighter contact - principally group project supervision, in the course of planning and carrying out a group coursework based on industry standard methods in ISO 13407 (currently being amended to be ISO9241-210). A final 3-week phase prepares the learners and their groups to participate in pitches¹ to an audience including local entrepreneurs and focus on defining, protecting and exploiting digital media intellectual property, the market appeal and the business model. Thus learners will learn about defining, protecting and exploiting intellectual property, cost-modelling, business planning, concept development, pitching, and presentation. A final reflective phase will allow the learner to contrast their experience with past Edinburgh Napier commercial collaborations and spin-out activity, evaluating all of this in the context of both the MIT/Stanford approach to innovation in digital markets (eg Smith et al, 2001; Preston, 2004) and contrasting European human-centred approaches in (Mootee, 2007; McEwan et al, 2004, EUSSET.eu, 2008). This leads to being able to critique the effectiveness of state-initiatives (eg NESTA 2008) in Scotland to support digital markets in for example, Digital Media, ICT, Security and Sustainable Transport

Learning Outcomes for module:

On completion of the module you will be able to (references in parentheses refer to role definitions and levels in the Skills Framework for the Information Age)

LO1: Recommend potential strategic application of IT in the digital marketplace (INOV6)

LO2: Work in a group to exploit IT assets in an innovative way, to the benefit of organisations and/or the community. (INOV6)

LO3: Conceptualise ways to improve the interface between the business (or organisation) and IT. (INOV6)

¹ We used to use the term "dragon's den" type pitches until a local angel advised us how much the community despise that programme.

LO4 Monitor technology markets to gain knowledge and understanding of currently emerging technologies (EMRG5).

LO5: Identify new and emerging hardware and software technologies and products, assess their relevance and potential organisational value and brief staff, management and investors(EMRG5).

Indicative References and Reading List - URL:

T1: Gaines, B., & Shaw, M. (1986). A learning model for forecasting the future of information technology. *Future Computing Systems* , 31-69.

T2: Griliches, S. (1957). Hybrid Corn: An Exploration in the Economics of Technological Change. *Econometrica*. 25(4) 501-522.

T3: McEwan, T., Benyon, D., & Turner, S. (2003). Channelling expertise from Napier's HCI group - human-centred knowledge transfer. In Gray, P., Johnson, H., & O'Neill, E. (Eds) *Proceedings of HCI2003: designing for society* Volume 2. Bristol: Research Press. (nb developed for human-centred innovation and in submission for 2009/2010)

T4: Moore, G. (1999). *Crossing The Chasm*, 2nd Edn. Oxford: Capstone Publishing.

T5: Mootee, I. (2007, August 27). Human Centered Design (HCD) Is Innovation's New Secret Weapon. Retrieved February 27, 2009, from Marketing & Strategy Innovation Blog:

http://blog.futurelab.net/2007/08/human_centered_design_hcd_is_i.html

T6: NESTA Policy & Research Unit. (2007). *Science and Innovation Strategy for Scotland*. London: NESTA.

T7: Preston, J. (2003, June). Building success into a high-tech start-up. *The Industrial Physicist* , pp. 16-18

T8: Smith, Michael D., Bailey, Joseph and Brynjolfsson, Erik (2001). *Understanding Digital Markets: Review and Assessment*(October 2001). MIT Sloan School of Management Working Paper No. 4211-01. Available at SSRN: <http://ssrn.com/abstract=290326> or DOI: 10.2139/ssrn.290326

What is the format of the course?

Face-to-face, although we hope to offer online and blended variants in future. It is in transition – initially there were 12 hours of contact in the first two weeks, 18 in the last three, with one hour a week in the intervening 6 weeks. For a number of reasons this is changing to 3 a week, with 2 in the middle two weeks.

The initial classes are designed to supply the basic material for all five learning outcomes. This will involve active classroom participation and is essentially exploratory and sense-making of the technology innovation landscape (addressing LO3 and LO5). Several recent case studies will be used based on recent collaborations with industry or projects to commercialise the School of Computing's intellectual assets. Learners will be directed to a selected range of papers, drawn from the last 50 or so years, each of which models technology innovation (addressing LO4). Learners will be encouraged to challenge each of these and then to apply their understanding to a recent innovation in a digital market (one will be supplied by the module leader or learners may nominate their own topic by agreement) which results in the short paper (3000 words) coursework due early in the trimester.

In groups of 4-5, the learners will develop a concept for a digital market (addressing LO2), meeting the module leader weekly in a mock briefing meeting, with a different deliverable due each week (eg PACT assessment, commercial assessment, development plan, risk management strategies). This leads to an intense period in the final teaching weeks where the class all come back together to develop an understanding of how to prepare an “elevator pitch” for their concepts (addressing LO1). The seminars will be a mix of each of the groups presenting their projects to each other and contributing criticisms, with further feedback from the module leader about their developing concepts

The above regime reflects a number of discussions with local employers and investors about employability. The development of concepts to potentially commercial viability, including each of the stages of presentation, involves considerable personal development. Scholarship skills are developed in the assessment of different approaches to innovation and in assessing competing trends in both the political and academic domains.

This module incorporates recently published research from within CiD and the DMID subject group, and also will access other innovation research from within the university (eg CSI and from NUBS) It is also intended that the students' papers would be potentially publishable as short papers at a conference (as has been the case with at least three separate level 11 group projects in recent years.)

Some innovation and commercialisation approaches commonly adopted are potentially exclusive – requiring for example long hours over a sustained time, disadvantaging those with responsibility for dependents. This module takes a more enlightened approach rooted in the alternative approaches found in Scandinavia and historically found in the UK.

Another common criticism of investment-led innovation is that it excludes those who do not “talk the same language” as investors, or worse, leads the naïve into disadvantageous contracts. This module seeks to provide the broadest possible insight into different business models, motivations and approaches.

This module benefits from active involvement in two key international efforts to improve the usefulness and acceptability of technology innovation throughout the world – UKInit.org and eusset.eu

Mode of activity	Learning & Teaching Activity	NESH (Study Hours)
FACE TO FACE	Lecture	10
FACE TO FACE	Tutorial / Seminar / Class Groupwork	24
Independent Learning	Other	2
Independent Learning	Groupwork	70
Independent Learning	Individual Learning Activities	94
	Total Study Hours	200
	Expected Total Study Hours for Module	200

How are students assessed?

[What type, and number, of assignments are students are expected to do?. How long do you expect students to spend on completing assessed work?]

Type of Assessment	Weighting %	LOs covered	Week due	Length in Hours/Words
Report	50	3,4,5	6	WORDS= 2500-3000
Report	25	1,2	12	HOURS= 15MINS
Report	25	1,3,5	13	WORDS= 1500

Formative: The intensive nature of the early classes will be designed to encourage self-reflection on learner's existing understanding of commercial innovation in digital media (LO 3,4). Learners will be encouraged to debate topical issues in class (LO 5) and in the VLE, and thus gain peer and tutor assessment (albeit not counting towards final marks) on the breadth and depth of their understanding.

A weekly “surgery” hour will allow all learners the chance to seek clarification and reinforcement of their understanding of the first assessment.

The group supervision meetings will support students to identify the strategic (LO1) and innovative (LO2) aspects of their group project

The subsequent classroom sessions leading to the presentation coursework, will incorporate

both immediate verbal feedback and more traditional written summative feedback.

Summative: Coursework 1 will specifically measure learner's abilities to monitor existing technology innovation in digital media (LO4), identify potential for further innovation, and how to fit this to the business need (LO 3,5). This will be marked and comments and marks will be returned to learners in advance of the "dragon's den" style pitches which will assess the suitability of the idea for the marketplace (LO 1,2).

The final paper will be an exercise in reflective practice, in which learners supply their own formative feedback in terms of how their proposition could be more strategically aligned to the market (LO1) and be more clearly relevant to the needs of individual businesses (LO3) and maximise advantage from emergent hardware and software (LO5). The marks and summative feedback for coursework three will be emailed to the student after the end of the semester.

Course textbooks and materials

- As well as the references listed above, a number of home-grown case studies based on knowledge transfer projects ([KTP](#)) and spin-out activity are provided. In some cases these were written up by government agencies eg [Video](#)
- [NCR](#), [Vibration Tech](#), [Canan](#), [DigMedia \(p26 formerly MemCorp\)](#)

Why do you teach the course this way?

Student response has been good, but still quite small. Some aspects of it are re-used in undergraduate teaching – a first year HCI course (ie A-level equivalent), a junior honours Creative Group Project, and an honours year Creative Computing module, both done by interaction design students.

We are interested in exploring the space between raw VC approaches to enterprise (1 massive success in every 20) and more user-centred socially-responsible innovation. We also emphasise student understanding of business/financial/market issues, and use conference-style anonymous peer review to build this.

The change from high contact at the start and end to more consistent contact is partly driven by room availability, and the late arrival of some (mainly overseas) students, but the intention remains to get individual and then group projects forming the basis for the learning

Integration

Students consider current funding mechanisms for university spin-outs eg Scottish Enterprise proof of concept. We have an incubator starting this term, with 24 workstations, meeting room, social space etc, and we hope to integrate with BCS Entrepreneurs SG and Informatics Ventures