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Version: Version of Record

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## Knowledge Exchange Seminar Series (KESS)

### Delivering effective enterprise education – the role of learning design and technology

Professor Pauric McGowan (UU), Dr Richard Blundel (OU) and Dr Kristen Reid (OU)

#### Abstract

Public policy statements on enterprise and entrepreneurship education have emphasised its importance in relation to the promotion of economic growth, community development and resilience. However, there is continuing debate over the nature, scope and effectiveness of existing approaches. For example, a recent United Kingdom government study found that while there is evidence of an overall strengthening of provision, enterprise and entrepreneurship education is not yet widely embedded across the full range of vocational learning (BIS 2013). In a joint statement in 2003, the Department of Enterprise, Trade and Investment, the Department of Education and the Department of Employment and Learning stated that, 'The future prosperity of society depends on all our young people, including the brightest and the best and their parents coming to regard the business sector and in particular setting up their own business, as a valid and realistic career option', thus underlining their determination both to embed entrepreneurship skills across the curriculum and to promote awareness of entrepreneurship across the education system in Northern Ireland. This presentation will review developments in the field of enterprise education, with a particular focus on the potential contribution of new technologies and associated learning designs. It will also consider some key challenges in delivering effective educational opportunities for students, including the requirement for contextualised and experience-based learning, and encourage sharing of innovative practices among participants.

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## 1. Introduction

There is a complex but broadly accepted connection between rates of entrepreneurial activity and indicators of economic prosperity<sup>1</sup>. This observed effect is particularly strong in innovation-driven economies such as Northern Ireland (NI)<sup>2</sup>. There are also marked regional variations in observed measures of entrepreneurial activity, and evidence from around the world suggests that these differences can be persistent<sup>3</sup>. The underlying causes are complex but are often related to geography (e.g. access to remote rural areas) and history (e.g. the long-term impact of the decline of large-scale industries such as shipbuilding)<sup>4</sup>. Though it remains the subject of continuing debate, there is evidence that enterprise education, in various forms, has the potential to increase both the quantity and quality of entrepreneurial activity at an individual level<sup>5</sup>.

**Enterprise education** has been defined as defined as, ‘the process of equipping students (or graduates) with an enhanced capacity to generate ideas and the skills to make them happen’ while **entrepreneurship education** can be seen as equipping students with, ‘the additional knowledge, attributes and capabilities required to apply these abilities in the context of setting up a new venture or business’<sup>6</sup>. This briefing paper focuses on entrepreneurship and enterprise education in HEIs but we acknowledge and make some reference to the necessary inter-connections with enterprise education initiatives other settings, including further education colleges, schools and in the community. In order to reflect the main theme of the KESS session, the briefing also concentrates on **technology entrepreneurship**. This includes both formal and informal enterprise education for business and technology students, with additional reference to technology-related spin-outs and various forms of knowledge exchange/transfer, where HEIs collaborate with external technologists, scientists and entrepreneurs. However, it is important to emphasise that many of the arguments can be applied to other forms of entrepreneurship (e.g. regional foods, artisan products, social and community enterprises) that also have an important role to play in promoting NI’s economic, social and environmental progress.

The paper is structured as follows. In the next section we provide an overview of key policy reports and interventions in NI during the last 15 years in order to set the context, assess what has been achieved to date, and identify areas requiring further attention. This is followed by a review of recent developments in learning design and technology, with two case studies to illustrate their potential contribution to enterprise education. In the concluding section, we draw out the implications and propose an agenda for future discussions.

## 2. Overview: recent policy and practice

Public policy in NI in recent times has emphasised the importance of enterprise and entrepreneurship education in supporting regional economic growth and the development of communities. It is suggested that a crucial part of any strategy for achieving and maintaining the future prosperity of Northern Ireland is that

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<sup>1</sup> BIS (2013) *Enterprise education impact in higher education and further education: final report*. London: Department for Business, Innovation and Skills.

<sup>2</sup> GEM UK (2011) *Northern Ireland Report 2011* (Mark Hart and Jonathan Levie). Available at: [http://www.investni.com/gem\\_northern\\_ireland\\_report\\_2011.pdf](http://www.investni.com/gem_northern_ireland_report_2011.pdf)

<sup>3</sup> See, for example: Greene, F.J., Mole, K.F. and Storey, D.J. (2008) *Three Decades of the Enterprise Culture: Entrepreneurship, Economic Regeneration and Public Policy*. Basingstoke: Palgrave Macmillan.

<sup>4</sup> See, for example: Checkland, S.G. (1976) *The Upas Tree, Glasgow, 1875–1975: A Study in Growth and Contraction*. Glasgow: University of Glasgow Press.

<sup>5</sup> Recent examples of research on the effects of entrepreneurship education include: Pittaway L. and Cope J. (2007) ‘Entrepreneurship education: a systematic review of the evidence.’ *International Small Business Journal*, 25, 5: 479-510; von Graevenitz, G, Harhoffa, X and Weber, R. (2010) ‘The effects of entrepreneurship education.’ *Journal of Economic Behavior & Organization*, 76: 90–112.

<sup>6</sup> QAA (2012) *Enterprise and entrepreneurship education: guidance for UK higher education providers*. Gloucester: The Quality Assurance Agency for Higher Education. Available at: [www.qaa.ac.uk](http://www.qaa.ac.uk)

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students within the education system and indeed their parents are encouraged to view business, and entrepreneurial business venturing in particular, as a valid career option<sup>7</sup>.

There are some signs that NI has made progress in this area recently with respect to students in the further and higher education system. For example, in 2008 the proportion of 18-29 year olds who said they had received formal training in starting a business from a college or university (i.e. outside the formal curriculum) was 29%, well below the equivalent figure for Wales (58%) and somewhat lower than that for England (39%) and Scotland (35%). In 2011, responses to a similar question produced a much higher percentage for NI (51%)<sup>8</sup>. GEM studies have also suggested that a large HEI population may be associated with higher levels of early stage entrepreneurial activity<sup>9</sup>.

While there is evidence of an overall strengthening of provision, UK wide research also shows that the agenda for enterprise and entrepreneurship has not yet been widely enough embedded across the full spectrum of educational and vocational learning. In NI the challenge to promote the agenda for innovation and entrepreneurship within the education sector has become an increasingly important issue for policy makers. HEIs in particular are expected to prioritise their activity in this space<sup>10</sup>. A central part of this agenda is to see enterprise and entrepreneurship increasingly embedded within curricula across all faculties and for science, engineering and technology (SET) in particular. Between 2000 and 2009 the Northern Ireland Centre for Entrepreneurship (NICENT) was charged with promoting the entrepreneurship agenda within its partnership institutions, which included the University of Ulster, Queens University and Loughry College<sup>11</sup>.

There have been a number of policy initiatives in response to the challenge to promote the agenda for innovation and entrepreneurship within the higher education sector. Examples of the themes they have emphasised include:

- HEIs must be responsive to the needs of the economy and work towards meeting the skills needs of industry; maximising the potential of research and development (R&D); and promoting knowledge transfer<sup>12</sup>.
- HEIs need to prioritise their activity in terms of Innovation, R&D and Creativity and to contribute significantly to it. , pursuing ‘...excellence in this area and in supporting the translation of R&D into commercial opportunities and scientific breakthroughs’<sup>13</sup>.
- HEIs should develop innovative research in strategically important areas, and collaborate with and assist companies to engage in innovation<sup>14</sup>.

The draft Innovation Strategy for Northern Ireland 2013-2025 sees innovation as one of the primary drivers of economic growth in the best-performing regional and national economies. It emphasises the importance

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<sup>7</sup> DETI (2003) *Entrepreneurship and Education Plan*. Belfast: Department of Enterprise, Trade and Investment, the Department of Education and the Department of Employment and Learning, p.6.

<sup>8</sup> GEM (2011), pp. 14-15.

<sup>9</sup> *Ibid.*, p. 10. GEM’s indicator for early stage entrepreneurial activity across the UK was significantly higher for graduates (9.4%) as compared to non-graduates (6.5%). The equivalent figures for NI were broadly similar at 8.0% and 6.5% respectively.

<sup>10</sup> DEL (2013) *Graduating to Success: A Higher Education Strategy for Northern Ireland*. Belfast: Department of Employment and Learning.

<sup>11</sup> NICENT was funded by the UK Department for Trade and Industry and Invest Northern Ireland as part of the Science Enterprise Challenge (SEC) centres of excellence programme. Evaluations suggested that NICENT increased interest and positive attitudes towards entrepreneurship in Northern Ireland. See: Hegarty, C. (2006) ‘It’s not an exact science: teaching entrepreneurship in Northern Ireland.’ *Education + Training*, Vol. 48 No. 5, pp. 322-335.

<sup>12</sup> DEL (2013) *op cit*.

<sup>13</sup> *Ibid.*, p14.

<sup>14</sup> Skills Strategy for Northern Ireland: Consultation Document 2013-2025. Available at: <http://www.delni.gov.uk/index/successthroughskills.htm>

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of an innovation focus in the context of global challenges<sup>15</sup>. In common with other similar reports, it defines innovation as: **‘the successful generation and exploitation of new ideas’**<sup>16</sup>. Others view entrepreneurial people as those who are obsessively focused on the identification and exploitation of opportunities, they are people high in creativity and innovation and high in management ‘know-how’ and ‘know-who’<sup>17</sup>.

The vision to create a culture and environment within Northern Ireland by which it could prosper by using its knowledge, skills and capacity is a core theme in its regional innovation strategy. The strategy challenges the Northern Ireland Education system to adopt an enhanced role in developing a culture for innovation and creativity, enabling people to recognise opportunities in the emerging knowledge economy<sup>18</sup>. HEIs must therefore seek to provide students with opportunities to develop the skills, attributes and experiences that set them apart and that enhance their prospects for employment, including self-employment and an entrepreneurial new venturing career<sup>19</sup>. Any portfolio of skills, attributes and experiences including the development of ICT skills in particular, ‘...should include personal development, creative thinking allied to enterprise and innovation, international mobility opportunities and embedding employability skills within the curriculum’<sup>20</sup> In addition to creating an additional 300 PhD places in areas of economic relevance in the HEIs in NI, and to increasing the number of postgraduate places to 1000 by 2020, Government is also committed to increasing investment in other programmes in this space which support collaboration between HEIs and Colleges and the business sector such as KTPs, KTNs, Innovation Vouchers, Creative Credit Vouchers as well as Specialist Provision for Industry using College Expertise centres, (SPICE)<sup>21</sup>.

There is evidence to suggest that if the numbers of technology-based businesses emerging from HEIs are to rise, it will be necessary to increase the flow of entrepreneurial talent from within SET faculties in particular seeking to commercialise technological opportunities through venturing<sup>22</sup>. The career path of many technology entrepreneurs is characterised by a journey which comprises several years at university and ten to fifteen years in employment before the step up to entrepreneurship; few make the transition to entrepreneurship before the age of thirty. **The challenge is to increase numbers of students starting businesses whilst at college or university, on graduation, or soon thereafter.** If the present reality is that most entrepreneurs are not that young when they start, this raises the questions about what can be done to bring the entrepreneurial future forward. Entrepreneurship education and related enterprise activities, stimulated and supported via government programmes and other institutional initiatives, have the potential to influence the entrepreneurial career path of the future<sup>23</sup>.

## 2. Research review: enhancing entrepreneurial skills through online education

This section summarises selected literature, including some of our own research, at the intersection of enterprise education in HEIs and recent innovations in learning design and technology. This brief review cannot provide a comprehensive account of this diverse and rapidly-growing field of study. However, it does outline a number of approaches to learning that have proved effective in other contexts, while also offering scope for development in a NI context.

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<sup>15</sup> DETINI (2013) *Draft Innovation Strategy for Northern Ireland 2013-2025*. Available at: [http://www.detini.gov.uk/innovation\\_strategy.pdf](http://www.detini.gov.uk/innovation_strategy.pdf)

<sup>16</sup> *Ibid.*, p.6.

<sup>17</sup> Timmons and Spinelli (2009) *New Venture Creation: Entrepreneurship for the 21st Century*. Maidenhead: McGraw-Hill.

<sup>18</sup> Regional Innovation Strategy for NI-Action Plan (2008/11), DETI.

<sup>19</sup> DEL (2013)

<sup>20</sup> *Ibid.*, p.18.

<sup>21</sup> Skills Strategy for Northern Ireland: Consultation Document 2013-2025.

<sup>22</sup> McGowan, P. and Cooper, S. (2012) Taking technological opportunities to the market: the role of university-based business plan competitions in supporting high technology commercialisation. *New Technology-Based Firms in the New Millennium*. Edited by A. Groen., R. Oakey., P. Van der Sijde and G. Cook, (Vol. IX), pp. 23-38. Bradford: Emerald.

<sup>23</sup> *Ibid.*

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Online education programmes offered through HEIs have the potential to support and encourage creative thinking and develop the courage to take risks – two important attributes that are seen to underpin entrepreneurial innovation. Simply getting students to use technology effectively will not accomplish this goal as the latest thinking about online education (and, indeed, all types of education) emphasises a collaborative and interactive process of learning. Effective online education is facilitated and social, which engenders the development of learning communities and peer learning<sup>24</sup>.

As e-learning approaches mature, the underlying pedagogy has received greater attention with technology seen to enhance and enable the learning experience. The term ‘online learning’ refers to learning materials accessed in an online environment, but it is usually limited to describing online-only learning experiences.

**Technology-enhanced learning**, on the other hand, can include a mix of approaches. These include ‘**blended learning**’, which may use both online (and/or distance) learning materials, face-to-face classes, and self-study<sup>25</sup>. The maturing of these technologies opens up new ways of engaging with learners and challenging the teaching and learning process. Yet despite ubiquitous use of social media and other technology in today’s world, skills in digital literacy for educational purposes are lacking in many of today’s learners. Technology-enhanced curricula, therefore, require a purposeful use of technological tools, combined with activities that build student skills in working with peers, that encourage self-directed learning, that build on core skill development and experiential learning. These emerging characteristics of enterprise education are also developing in more traditional, ‘brick-and-mortar’ educational environments. However, new technological tools have enabled educators to develop effective learning experiences in the online virtual space and at a distance. In the following points we summarise **three key themes** emerging from this work:

- 1. Learning needs to be active:** Whether the context is **formal** (e.g. a structured programme in an HEI), or **informal** (e.g. an extra-curricular activity or a social media interaction), learning is an **active** process. Successful learning designs provide for more than just the simple delivery of content. A good example of how active learning is seen as more effective than passive learning can be seen with the recent emergence of MOOCs (Massively Open Online Courses), in which media-rich, online curricula provide free access to learning materials. The scale of MOOCs can certainly be seen as an achievement with some courses regularly surpassing 100,000 participants worldwide, though with far fewer completions<sup>26</sup>. However, not all MOOCs operate in the same way. Some MOOCs are simply ‘conventional’ courses offered in a limited fashion online with little scope for interaction or active learning. As the MOOCs trend develops, HEIs are beginning to recognise that while some of these content-rich, informal courses are very popular, they may be less effective as vehicles for promoting learning. A different MOOCs approach is one that utilises a more **interactive** experience through **collaborative and peer learning**<sup>27</sup>. Here, participants contribute to the content and learn from one another. The learning is collaborative and ‘co-created’, and therefore relevant to the student. Perhaps more so than in other types of professional learning, entrepreneurship requires an active learning approach, especially if it is to support active thinking and risk-taking, yet such approaches remain relatively rare in formal higher education<sup>28</sup>.

<sup>24</sup> JISC (2009) *Effective practice in a digital age*. Available at:

<http://www.jisc.ac.uk/publications/programmerelated/2009/effectivepracticeditalage.aspx>

<sup>25</sup> For example, enterprise educators are using ‘digital storytelling’ techniques (i.e. short, often self-produced video narratives) to examine and share diverse experiences of entrepreneurship. Simulation games have also become a popular technology-based tool in enterprise education, which can be used in face-to-face, online-only and blended learning.

<sup>26</sup> For a recent review of the field, see: BIS (2013) *The Maturing of the MOOC* (BIS research paper number 130). Available at: <https://www.gov.uk/government/publications/massive-open-online-courses-and-online-distance-learning-review>

<sup>27</sup> There are at least two types of MOOCs. One offers more conventional content via online media, such as video lectures; another (termed ‘c-MOOCs’) offers less defined content and is participant-driven. See: Osvaldo Rodriguez, C. (2012) ‘MOOCs and the AI-Stanford like courses: two successful and distinct course formats for Massive Open Online Courses.’ *European Journal of Open, Distance and E-Learning*. Available at: <http://www.eurodl.org/index.php?article=516>.

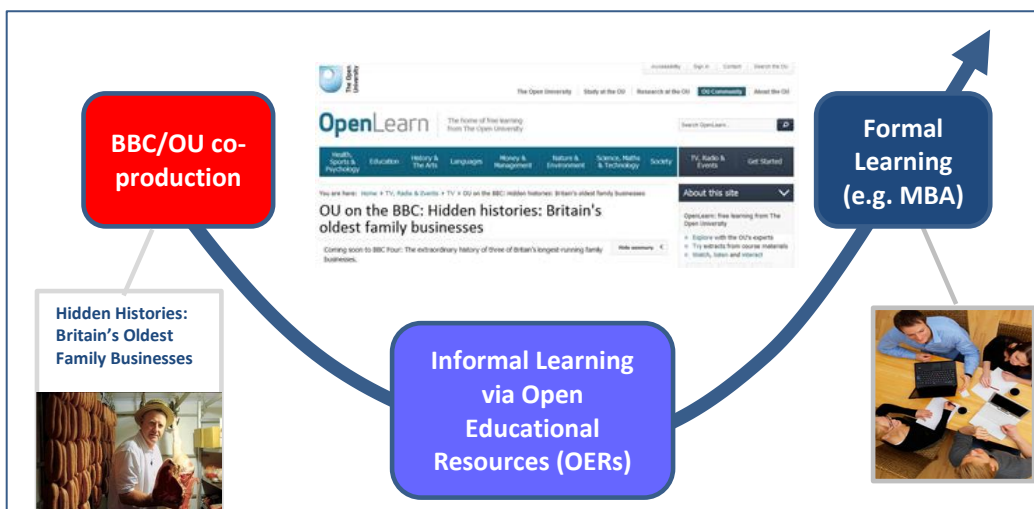
<sup>28</sup> For example, a recent review of the field argues that, ‘learning environments that encourage the development of creativity and innovation together with business acumen are rare, even though combining these elements is a key aspect of enterprise education.’ (QAA 2012: 7).



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- 2. Learning is a lifelong endeavour:** While this briefing focuses on enterprise education within HEIs, we also need to recognise that entrepreneurs (including those active in technology-based ventures) are influenced by their earlier patterns of learning as well as other life experiences<sup>29</sup>. This is exemplified by The Open University's **'learning journey'** approach, which incorporate popular broadcast and online programming. Examples include: BBC/OU co-productions (e.g. 'Hidden Histories: Britain's Oldest Family Businesses'), iTunesU tracks, and online citizen science initiatives (e.g. 'Open Science Laboratory', an OU/Wolfson Foundation initiative). They can generate interest amongst large audiences of potential learners, with a proportion following through to informal learning opportunities via the OU's *OpenLearn* website and formal university courses (Figure 1)<sup>30</sup>. This multi-platform approach could be readily adapted to promote interest in, and further engagement with, technology entrepreneurship in NI.

Figure 1: Example of a multi-platform 'learning journey'



- 3. Learning is contingent:** The latest thinking in online education tells us that there are many types of learning experiences, which confer different benefits. For example, **'associative' learning** (often based on mastering content) builds competences. On the other hand, **'constructive' learning**, encourages learners to generate new ideas and test these individually or collaboratively. Another type, **'situative' learning**, focuses on how relationships and communities of practice can facilitate knowledge-creation<sup>31</sup>. Here, the focus is on the development of a 'community of practice' and where learning is peer-based and collaborative and seeped in practice<sup>32</sup>. A finely-tuned technology-enhanced learning design will often incorporate a mix of these approaches, depending on the requirements of the learner and intended outcomes of the activity. For example, if the aim is to develop creativity in a group of people, a mix of all of these types of learning would be ideal in order to build competences, inspire creative ideas and collaboration and supporting sharing among peers.

The implication for technology-enhanced enterprise education, therefore, is that a broad range of approaches are needed rather than a single solution. If we are to be inspired, therefore, by the latest thinking on technology-enhanced education, we need to develop solutions that:

<sup>29</sup> See, for example: Cooper, S. (2006) 'Exploring the pre-entrepreneurial careers of high-technology entrepreneurs.' *International Journal of Continuing Engineering Education and Life-Long Learning*, Vol. 16, No. 5, pp. 341-354.

<sup>30</sup> For example, over the period June 2008 to November 2013, there have been more than 65 million downloads from the OU's iTunesU site. Over 9 million visitors have downloaded files, the current average rate being 87,500 downloads a week. For details, see: <http://projects.kmi.open.ac.uk/itunesu/impact/>

<sup>31</sup> JISC (2009), p. 11.

<sup>32</sup> Lave, J. and Wenger, E. (1991) *Situated learning: Legitimate peripheral participation*. Cambridge: University of Cambridge Press.

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- **Actively engage students in their learning** – making it contextualised and collaborative
- **Recognise the many different entry points for learning journeys** – and therefore offer different learning opportunities for different points in an entrepreneurial career
- **Develop learning experiences that offer multiple benefits and support different types of learning** – to reflect the diversity within student cohorts

The following cases illustrate these three characteristics and offer brief examples of how technology and learning design can enhance enterprise education.

## **Case 1: Developing entrepreneurial potential at the University of Ulster**

On-line learning resources in 'Entrepreneurship Awareness' were developed during the NICENT project (2000 to 2009). They were initially designed to build the level of awareness of students within science, engineering and technology (SET) faculties of entrepreneurship in all its guises, including enterprise development, new business venturing and social enterprise. The emphasis was very much on learning 'about' entrepreneurship rather than 'for' entrepreneurship, such was the level of ignorance about the nature of entrepreneurship and the size of the constituency that needed to be introduced to the subject. In the lifetime of the project over 20,000 students across all the partner institutions of NICENT learnt about 'entrepreneurship'. A further, more bespoke on-line module was developed, which focused on 'Entrepreneurship in Practice'. Here, the emphasis was on encouraging students to develop entrepreneurial attitudes as well as competencies to act entrepreneurially. These on-line learning resources in enterprise development were further refined and have been utilised by several cohorts of students at the University of Ulster to support their learning over the past decade. More recently the University of Ulster has, in collaboration with external providers, launched the 'Business Launch Pad' programme, supported by an on-line learning portal and community. This is a pilot project supported by Invest NI, designed to guide students as they explore their self-employment ambitions. Key foci of the project are to develop participants' attitudes towards entrepreneurial new venturing as well as key competencies in terms of teamwork, market research, sales development and business plan development. The development of an on-line community is an important part of the learning portal allowing student to access specific on-line tools to support learning, work collaboratively, share ideas and find events to meet with other like-minded entrepreneurial people. In addition, the University is developing the 'Open Ulster Knowledge Portal' managed by the University's Office of Innovation. Supported by the Higher Education Innovation Fund, (HEIF), it is planned to promote technology transfer and to develop a community of activists at the interface between business practitioners and the University who are interested in leveraging value from research activity.

## **Case 2: The Open University's U101 Design Thinking: Creativity for the 21st Century**

The OU launched a wholly-online, introductory undergraduate design course in 2010. Fundamental to its purpose was the underlying belief that 'design thinking' was applicable to many more disciplines and professions than just the creative arts. In the words of its co-developer, 'When everyday problems are understood as design problems, many possibilities open up in engaging people in areas where design is often desperately needed and can really help to improve the quality of people's lives.' Design thinking is appropriate for developing problem-solving skills that 'go beyond business'<sup>33</sup>. The course aims to develop students into '**reflective practitioners**' – a pedagogical approach developed by Donald Schön<sup>34</sup> and used widely in business schools around the world. Students post photos of their work to a virtual design studio wherein their peers will evaluate and feedback on the work. There is a diverse student body: their ages

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<sup>33</sup> Lloyd, P. (2013) 'Embedded creativity: teaching design thinking via distance education.' *International Journal of Technology and Design Education*, Vol 23, No. 3, pp. 749-765.

<sup>34</sup> It is interesting to note that although Donald Schön is widely known among business academics for his reflective practice approach, not so widely known is that he was firstly an influential design educator. The link, therefore between creativity and business acumen is implicit in the approach. See: Waks, L.J. (2001) 'Donald Schon's philosophy of design and design education.' *International Journal of Technology and Design Education*, Vol. 11, pp. 37-51.



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range from under 25 to over 65 years, over half are in full-time employment and they come from a wide range of professional backgrounds – all of which creates additional learning potential. The course relies heavily on peer interaction (e.g. students share their expertise and provide critiques in the virtual design studio and online discussions). Local tutors facilitate student learning (e.g. moderating discussions and marking assignments) and a theme of ‘quiet design’ is used to emphasise the universal applicability of design thinking (e.g. in one assignment students design a game based on a familiar local product or service)<sup>35</sup>.

### 3. Conclusion and implications

This paper has highlighted a number of interesting developments in enterprise education. In this briefing, our primary focus has been on promoting technology entrepreneurship in the higher education sector, but many of the conclusions are applicable to other educational levels and types of entrepreneurship. While there has been considerable progress in promoting the enterprise education agenda, there is scope for further work, building on the best practice examples from within NI and internationally. The GEM study concluded that the picture in NI in 2011 suggested an apparent paradox in which: ‘entrepreneurial activity and intention were rising, yet attitudes were becoming more negative among the non-entrepreneurially active population.’ The authors explained this in terms of current economic conditions and argued that as a result: ‘the existence of training and signposting to resources for first time entrepreneurs is particularly important at this time.’<sup>36</sup> Our review of the evidence, coupled with our own experience as educators and researchers, lends support to this contention. Furthermore, we suggest that the following issues merit particular attention and could contribute to future discussions and agenda-setting in this area:

- **Clarify the focus of existing enterprise education initiatives and future investments in NI:** what are the main aims and priorities?; who are the learners?; and what are their learning needs?
- **Engage relevant stakeholders in framing interventions:** which individuals and organisations are best placed to identify appropriate learning outcomes, to design and develop interventions; and to provide both financial and non-financial support?
- **Address pedagogic, organisational and infrastructure issues:** how can emerging technologies and insights from technology-enhanced learning be incorporated into specific educational programmes?; what are the main technical and organisational barriers to delivering multi-platform and inter-organisational collaborations?; how can the potential benefits of such collaborations be communicated?
- **Build effective monitoring and evaluation from the outset:** what are the key components of an effective enterprise education intervention in this context?; what qualitative and quantitative indicators should be adopted in order to track progress?

There is a considerable emphasis in many of the policies reviewed above (Section 2) on the need for HEIs to engage in more innovation and R&D. We know that entrepreneurial people are the ones who take calculated risks to exploit these innovations and to leverage value from them. However, recent GEM reports on NI have cited fear of failure, a perceived lack of skills and low self-belief amongst the population as the key influences preventing more of them from engaging in entrepreneurial activity. A concrete commitment to encouraging more and more people in NI to behave entrepreneurially – and to actually *build* new ventures around innovative ideas identified here – may well be a next step in this programme of development. Learning design and technology could have an important role to play in bringing such changes about, by supporting student learning within HEIs, building a more effective interface between academia and the business sector, and promoting real changes in attitudes to enterprise and self-sufficiency in society<sup>37</sup>.

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<sup>35</sup> Another new online OU module, *BB846 Entrepreneurship: Experience and Perspective*, has a similarly diverse student body and shares several of these design features. It incorporates a virtual team-based new venture creation activity and has demonstrated the capacity of students to both collaborate online on a practical entrepreneurial activity and to reflect critically on their experiences.

<sup>36</sup> GEM (2011) *op cit.*, p. 16.

<sup>37</sup> See, for example: Bridge, S. (2010). *Rethinking Enterprise Policy: Can Failure Trigger New Understanding?* Basingstoke: Palgrave.