

A Critical Perspective on Learning Outcomes and the Effectiveness of Experiential Approaches in Entrepreneurship Education: Do we innovate or implement?

Dr Jonathan M. Scott, Teesside University

Professor Andy Penaluna, University of Wales Trinity St David

Emeritus Professor John L. Thompson, University of Huddersfield

Scott, J.M., Penaluna, A. and Thompson, J.L. (2016) 'A critical perspective on learning outcomes and the effectiveness of experiential approaches in entrepreneurship education: do we innovate or implement?', *Education + Training*, 58 (1): 82-93.

A Critical Perspective on Learning Outcomes and the Effectiveness of Experiential Approaches in Entrepreneurship Education: Do we innovate or implement?

Purpose: We conduct a critical appraisal of how experiential approaches can more effectively enhance the achievement of desired learning outcomes in entrepreneurship education. In particular, we critique whether actual learning outcomes can be profitably used to measure effectiveness; and consider how student performance can be evaluated through the twin lenses of implementation or innovation.

Design/methodology/approach: We undertook a review of both traditional and experiential approaches to entrepreneurship education. In addition to comparing these approaches, we critiqued a number of ‘taken for granted’ assumptions regarding the effectiveness of experiential approaches to entrepreneurship education and made recommendations.

Findings: Although there is a large body of research on experiential approaches towards entrepreneurship education, we know little about how these approaches contribute towards the effective achievement of desired learning outcomes. Whilst many authors claim that such approaches are effective, such assertions are not supported by sufficient robust evidence. Hence we need to establish more effective student performance evaluation metrics. In particular whether: (1) actual learning outcomes are appropriate measures of effectiveness; and (2) we should evaluate student performance through the lenses of the two ‘Is’ - implementation or innovation.

Practical implications: Whether actual learning outcomes are used as a measure of effectiveness at all needs to be critiqued further. Implementation involves doing things that are determined by others and matching against their expectations, whereas innovation comprises producing multiple and varied solutions that respond to change and often surprise.

Originality/value: Through revisiting the discussions on the art and the science of entrepreneurship education, this article represents an initial critical attempt – as part of an ongoing study – to fill a gap in entrepreneurship education research. The article, therefore, has significant value for students, entrepreneurship educators, and policy-makers.

Key words Experiential, entrepreneurship education, effectiveness, learning outcomes, implementation, innovation, student performance, UK

Article Classification: Conceptual paper

1. Introduction

Despite extensive research into entrepreneurship education¹ (e.g. Dainow, 1986; Gorman et al, 1997; Hannon et al, 2004; Pittaway and Cope, 2007b; Solomon et al, 1994; Blenker et al, 2014), many studies focus upon pedagogical “good practice”, rather than establishing its effectiveness. As well as achieving the social goals of any curriculum in terms of enabling students to fulfil their potential and ultimately to obtain gainful employment, entrepreneurship can also potentially be evaluated to establish whether it meets its desired objectives or learning outcomes. Our aim, therefore, is to conduct a critical appraisal of how experiential approaches can more effectively enhance the achievement of learning outcomes in entrepreneurship education. In particular, we critique whether actual learning outcomes can be profitably used to measure effectiveness; and consider how student performance can be evaluated through lenses of implementation or innovation.

Blenker et al (2008) argued that entrepreneurial skills cannot be taught properly or effectively within many universities due to their faculty’s inability to motivate students to innovate and the lack of the right type (i.e. experiential) of pedagogical approaches. Concomitantly, this paper does not attempt to analyse or assess students’ skills and “competencies” (Binks et al, 2006; Blenker et al, 2008) but rather more specifically whether desired learning outcomes are achieved. Whilst entrepreneurship education advocates have developed philosophical underpinnings (e.g. Hannon, 2005), the linkage between philosophical thinking on experiential education and entrepreneurship education (and its outcomes) remains tenuous. It appears to be expected that experiential approaches will lead to effective learning, but the authors question if realistic and constructively aligned learner performance evaluation metrics are in place. Further research upon this topic is necessitated by the paucity of ‘evaluations of effectiveness’, or ‘how learning strategies influence the development of entrepreneurial competences, and the ‘need to evaluate programmes’ (Henry et al, 2003; see also Henry et al, 2005a, b). This article focuses upon experiential approaches and their effectiveness in terms of learning outcomes. In doing so, we seek to address Pittaway and Edwards’ (2012: 794) call, in this journal, for

“more careful consideration of assessment practice in entrepreneurship education ... particular forms of assessment practice (e.g. reflective and peer assessment) more deeply with a need to explore what value they provide.”

¹ Defined as: “the process of providing individuals with the ability to recognise commercial opportunities and the insight, self-esteem, knowledge and skills to act on them” (Jones and English, 2004: 356).

We follow the following structure. In Section 2, we compare and contrast traditional approaches to entrepreneurship education with more recent experiential approaches. In Section 3, we consider the effectiveness of entrepreneurship education, especially in terms of learning outcomes. In Section 4, we focus particularly upon a number of implications for practice which relate to, first, whether we should use actual learning outcomes as a measure of effectiveness and, second, whether we should evaluate student performance through the lenses of implementation or innovation. Finally, in Section 5, we provide conclusions, recommendations and some suggestions for future research.

2. Entrepreneurship Education Approaches: Traditional versus Experiential

This section contrasts more traditional, lecture-based approaches to the more innovative experiential approaches to entrepreneurship education (which are heavily influenced by the seminal learning theories of Dewey, 1938; Lewin, 1942; Kolb, 1984). First, we examine the way in which competence-based approaches have helped to develop students' knowledge and expertise and thereby contribute to the achievement of learning outcomes (which we return to in Section 3). Studies have specifically documented how experiential approaches are viable for entrepreneurship education (Cooper et al, 2004; Heinonen and Poikkijoki, 2006). The 'entrepreneurial-directed approach' has been evaluated, including by analysis of learning diaries, by Heinonen and Poikkijoki (2006), noting that this approach not only imbues students with 'entrepreneurial skills and behaviours' (as defined above and explained below) but also widens their 'perspectives' (ibid: 80). Indeed, Heinonen and Poikkijoki (2006) focus upon the holistic individual, not just on his or her knowledge and – through 'learning by doing' and reflection – the student becomes more competent and skilled in the important elements of entrepreneurial practice, such as recognizing opportunities (ibid). Taatila (2010) describes experiential projects as the 'most effective' method of learning because they are 'pragmatic' and use an 'abductive', rather than deductive or inductive, approach (ibid). Both authors highlight how 'holistic' entrepreneurial (psychological) competencies, rather than just rote learning, may be gained through more effective experiential approaches. Cooper et al's (2004: 11) evaluation of an experiential entrepreneurship programme in a Scottish university concluded that: 'the traditional lecture-based, didactic methods of teaching and learning alone are insufficient'. Such experiential approaches, could – speculatively – increase the learning outcomes of students on entrepreneurship courses, and arguably these approaches are assumed to enable entrepreneurial competences to be learned through experience.

Second, we consider some exemplars of experiential entrepreneurship education approaches that have been highlighted to be more excellent than traditional approaches. Methods identified in the US included the rising utilisation of technology, business plan writing and guest lectures by entrepreneurs, and also class participation, rather than traditional lectures (Solomon, 2007). Although Solomon's (2007) review does not suggest particularly experiential approaches, it is supported by national reviews elsewhere (Ibrahim and Soufani, 2002; Lewis and Massey, 2003; Hannon et al, 2006; Rae et al, 2010). 'Action learning' has been posited as a better alternative than just delivering information to students (Leitch and Harrison, 1999). Meanwhile, this approach is supported by evidence that what entrepreneurs are taught 'in textbooks' varies from what they actually do in practice (Edelman et al, 2008), though that does not necessarily mean that they are doing the right thing, nor would textbook learning actually make them more competent entrepreneurs. Consequently, there are no real conclusions to these studies, as they are most tentative and suggest that experiential approaches 'might' improve entrepreneurial outcomes, while learning outcomes are proxied by some kind of learning and competency development. Various exemplars of 'innovative' approaches to entrepreneurship education have been offered (such as by Kuratko, 1989; Hindle, 2001; Desplaces et al, 2009; Mitchell and Chesteen, 1995). Experiential corporate entrepreneurship education (Heinonen, 2007; Tunstall and Lynch, 2010), problem-based learning (Tan and Ng, 2006), how students can learn from failure and deal with its emotional impact (Shepherd, 2004), and entrepreneurship education for social entrepreneurs (Tracey and Phillips, 2007) are some key exemplars of experiential approaches to entrepreneurship education. Finally, some recent thinking on experiential entrepreneurship education addresses cognition (for example, Krueger, 2007; Kickul et al, 2010) with evidence that creatively cognitive students are more likely to intend to start a business (Hamidi et al, 2008), with other studies on how one can simulate the process of starting a business (Robinson, 1996), and how understanding cognitive processes in creativity can help with the development of entrepreneurship education approaches (Penaluna et al, 2010). There remains limited knowledge on how these approaches contribute towards effective achievement of learning outcomes, nor that robustly appropriate learning outcomes are being employed. If we further consider that implementing previously agreed and anticipated norms and approaches aids the evaluation of learner performance, the question arises as to how this kind of assessment facilitates new discoveries and the kinds of unexpected outcomes that we associate with innovation and creativity. If we cannot foresee the outcome because the innovation is not yet known, how can we measure student performance?

3. Effectiveness and Actual Learning Outcomes in Entrepreneurship Education

Accordingly, this section explores some of the literature on the effectiveness of entrepreneurship education, particularly in terms of learning outcomes. Prior studies, though limited and being most prevalent in recent years, have attempted to assess the effectiveness of entrepreneurship education, despite an apparent ‘mismatch’ between what entrepreneurs need and ‘actual outcomes’ (Matlay, 2008) and perceptions “not matching students’ skill expectations with skill acquisition” (Cheng et al, 2009). Although outcomes are influenced by ‘underpinning philosophy’ (Hannon, 2005), that does not necessarily link objectives with actual learning outcomes and these need to be fully understood (Hytti and O’Gorman, 2004). Whilst graduates not having sufficient ‘work experience’ is likely to militate against successful start up (Edwards and Muir, 2005), key weaknesses of entrepreneurship education included a lack of focus upon ‘competence’ (rather on ‘knowledge’) (Garavan and O’Cinneide, 1994: 3). Indeed, many established entrepreneurship education approaches are not experiential as such, but tend to involve traditional lectures and also business planning assessment (Honig, 2004; Pittaway and Edwards, 2012). First, we group together different measures of effectiveness that have been identified. These have included those which suggested that learners’ ‘propensity and intentionality’ is increased, but it is unknown whether they are thus ‘more effective entrepreneurs’ (Pittaway and Cope, 2007a), or their ‘perceptions of the desirability and feasibility of starting a business’ alters (Peterman and Kennedy, 2003), while other studies (e.g. McMullan and Gillin, 1998; Vij and Ball, 2010; Vij, 2014) found that entrepreneurship education programmes encourage students to consider starting their own business.

Second, we contemplate how actual learning outcomes of experiential entrepreneurship education can be more effectively evaluated. Experiential approaches can potentially improve the creative capacity of students (Gundry and Kickul, 1996), which could thereby enhance their ability to discover and exploit opportunities. This is important, because assessing student performance on their ability to make discoveries for themselves, becomes an essential aspect of the learning journey. For example, students may to work alongside, and learn from, actual entrepreneurs and thus build their competencies (Collins et al, 2006) but where, we question, is the associated learning and performance enhancement effectively evaluated? The argument could also be posited: are the entrepreneurs appropriately informed to assess and evaluate the learner? If not, as we would suggest, the role falls back on those with enhanced understanding of the learning journey and what could have been achieved.

Third, we consider assessment practice in light of the clear distinction between the ‘art’ and the ‘science’ of entrepreneurship (Jack and Anderson, 1999; Anderson and Jack, 2008). Whilst other authors consider the ‘art’ and ‘science’ (Jones and English, 2004; Henry et al, 2005b), part of the ‘art’ includes methods of assessing ideas generation within the ‘creative disciplines’ that can be adapted to entrepreneurship education courses (Carey and Matlay, 2010), which is relevant to this article given that both the ‘art’ and ‘science’ must be inculcated in students. Within entrepreneurship education programmes, therefore, students can be introduced to the ‘science’ relating to management and functional specialisms within businesses, which are perhaps best tackled through more traditional teaching and assessment methods that require the implementation of known theories and practices. It is clearly the ‘art’ that experiential approaches can be most effective in improving students’ competencies in (as proxied by learning outcomes) – and we focus on opportunity identification (in many ways, primarily the ‘art’) and exploitation (for example, through strategy and marketing, which is the ‘science’) and, consequently, the former would be more likely to be even more enhanced by experiential approaches. Moreover, assessing against known and well-defined outcomes with easily forecastable targets, differs significantly from scenarios where students may be required to demonstrate adaptability and resilience alongside abilities to pivot and change direction – as is the norm within ever changing circumstances and innovative ideas generation / opportunity recognition. Here, iteration and acceptance of change becomes a more appropriate goal. Hannon et al (2005) highlight that ‘traditional’ learning and teaching approaches within business schools are less effective, such that ‘entrepreneurial skills, knowledge and behaviour’ are more likely to be developed through ‘co-learning’, confirming Daly’s (2001) analysis of satisfaction surveys and ‘reflection papers’, and the finding that experiential approaches enabled students to enhance the levels of finance that they were able to obtain for student societies, as well as increasing their community engagement. However, the literature appears to rely upon conceptual papers as there is still a lack of empirical studies, and some that are ostensibly empirical (for example, Hartshorn and Hannon, 2005) rely upon a single case. Finally, evidence from Finland suggests that students’ motivations affect their ability to develop ideas for entrepreneurial contexts (Hytti et al, 2010). Pittaway et al (2009) highlighted the importance of linking learning outcomes and assessment methods, and that one way of assessing the effectiveness of experiential entrepreneurship education lies in the analysis of such assessment, for example reflective diaries. In the next section we focus upon the appropriateness of using learning outcomes to assess the effectiveness of entrepreneurship education, and contrast the two lenses of implementation and innovation.

4. Effectiveness, Learning Outcomes and Student Assessment: implement or innovate?

First, why use actual learning outcomes as a measure of effectiveness at all? Effectiveness relates to purpose and also to creating perceived value for people who care – and the implication is all the people who care. So we have to ask: why are we teaching this module (or paper), for whom and what is it they are looking for? It is the answers to these questions that should drive the learning outcomes if they are to be used to measure effectiveness. But are they really outcome driven and value related – or rather more likely to be based on academic assumptions and preferences. It can also be argued that creativity and innovation can only be evidenced in contexts, and that a student's learning environment will impact on the essential ingredient of newness. What may be new to one individual, group or society, may well be well-trodden ground to another. Learning outcomes might also relate more readily to measures of efficacy (are the stated learning objectives or desired learning outcomes being delivered?) and efficiency (can the learning objectives or desired outcomes be achieved with the resources available basically?). It is also an interesting question as to whether the relevant learning objectives (desired outcomes) are generic and relevant for experiential entrepreneurship 'anywhere' or whether (and how much) they are location-specific and thus vary from programme to programme depending on local needs. Is there any risk that a module or paper is really valuable for students in developing entrepreneurial orientation or entrepreneurship skills (which are both laudable and relevant outcomes), and it is delivered well by capable staff, but it fails to meet poorly specified desired learning outcomes. So it is not judged effective? The nature of experiential entrepreneurship approaches is that there is broad purpose and direction but an unclear route – participants (educators as well as students) learn as they go along about the value and relevance of particular choices and actions. There are therefore two themes – learning about specific cause and effect themes within the context of the purpose – and a broader purpose of refining behaviour and judgement capabilities. The educator's role is fundamentally to provide opportunities for students to experience and to learn. How specific can we realistically be about just what they learn however? They all start from different starting points, so we have to query how well we are setting the desired learning outcomes if we are using them as a measure of effectiveness. We could consider what we believe experiential approaches to entrepreneurship are really about and whether the desired learning outcomes we traditionally employ truly 'stack up'.

Second, when developing desired learning outcomes to differentiate more effectively between the art and the science elements, should we evaluate specific aspects of student performance through the lenses of implementation or innovation? Recalling that, a new idea or new initiative that takes advantage of complex or confusing environments will be by its very nature, unpredictable, utilising performance measures that are reliant on ‘known knowns’ becomes problematic. Conversely, skills relating to the generation of alternative ideas and the ability to see multiple solutions, so as to become adaptable flexible thinkers who demonstrate initiative, independence and innovation, become the imperative. This is not to say that retaining knowledge that is measurable against accepted norms and knowns should be discarded, far from it, however making distinctions between learning for ‘Innovation’ and learning for ‘Implementation’ help to define the dissimilar nature of these learning requirements.

Further articulated as the two I’s – Implementation (of predictable outcomes) and Innovation (of the process of being innovative), these evaluations can also be seen to relate to alternative thinking styles, those of divergent thinking (broad wide, interdisciplinary and tentative), with those of convergent thinking (eliminating aspects that are perceived to lack value and focusing on implementation through the use of existing knowledge and strategic approaches). To further simplify this, the two lenses could be seen as follows. First, implementation involves doing things that are determined by others and matching against their expectations. Second, innovation comprises producing multiple and varied solutions that respond to change and often surprise. The following list is tentative and based on practical approaches that are being developed in response to calls for more effective evaluation of both educator and student performance (ANONYMIZED)², and Table 1 presents indicators of the kinds of distinctions that may be made.

<INSERT TABLE 1 ABOUT HERE>

² ANONYMIZED

The appropriateness of assessment could also be aligned to the type and nature of learning opportunity being targeted. Whenever there is a high degree of uncertainty, for example in technological environments where the requirement for newness and change is constant, the innovation-based learning activities and associated performance evaluations become more pertinent, whereas student responses that are intended to relate to known knowledge, rules, standards and norms are implementation. Our article's main contribution is the elaborations we offer on our evolving perception that educators need to make these distinctions, and are based on the literature and associated discussions surrounding the art and the science of entrepreneurial education.

4. Conclusions and Implications

In terms of articulating the rationale for this research: first, we need to establish the effectiveness of experiential approaches so that investment in these by Government and universities may be justified; and, second, in the literature review we have identified that the argument for experiential entrepreneurship approaches is under-developed in that it launches well, continues to rise impressively, but then fails to “land” because of a lack of evidence of its effectiveness. Thus the argument for experiential approaches is two-fold but with a missing third fold. First, ‘traditional’ programmes, which rely upon lectures or other directed, non-experiential approaches to entrepreneurship education, are not effectively achieving their objectives, or these objectives are not ambitious enough to achieve effective outcomes. Second, experiential approaches are an interactive, participative, realistic, viable, and potentially more effective, alternative to these ‘traditional’ approaches and include, for example, simulation and other experiential approaches. Third, there is a lack of evidence on their effectiveness. The literature on entrepreneurship education, therefore, provides much argumentation – and ‘good practice’ documentation – on experiential approaches. These are assumed to be more effective than ‘traditional’ approaches. However, the underlying philosophy behind these approaches is not constructed upon how effective they are. In particular, we do not know enough about whether these approaches more effectively enable students to achieve desired learning outcomes, because these are ‘proving elusive’ (Matlay and Carey, 2007: 252).

The above research rationale leads, consequently, to the research aim and objectives outlined in the introduction, i.e. how experiential approaches can more effectively enhance the achievement of desired learning outcomes in entrepreneurship education. Inevitably, its major focus is upon opportunity discovery and exploitation, often within team-based assessments (Hytti et al, 2010) and how these experiential approaches can make students more competent in generating and implementing business ideas, which is how the learning outcomes are measured. That led us to ask why we should use actual learning outcomes as a measure of effectiveness at all? And to consider in some depth the two Is – Implementation (of predictable outcomes) and Innovation (of the process of being innovative). In this article, in seeking to address Pittaway and Edwards’ (2012: 794) call for “more careful consideration of assessment practice in entrepreneurship education ... particular forms of assessment practice (e.g. reflective and peer assessment) more deeply with a need to explore what value they provide”, our other subsequent research in progress has also conducted analysis of students’ reflective diaries to match desired learning outcomes to the actual learning outcomes achieved (ANONYMISED). While there is still little evidence from that subsequent research that experiential entrepreneurship education is more effective than other approaches that have traditionally been adopted, a large-scale longitudinal quantitative study would provide generalizable results to explore further this topic.

Although there is a large body of research on experiential approaches towards entrepreneurship education, we know little about how these approaches can potentially contribute towards the effective achievement of desired learning outcomes, or if the learning outcomes are appropriately aligned to the learning. Indeed, whilst it is argued in the literature that such approaches are effective because they are experiential, such assertions are not supported by sufficient robust evidence of student performance. We must also consider the role of the educator in terms of their projected or desired learning outcomes. For example, are their primary intentions and subsequent interventions intended to develop knowledge or to develop and enhance behaviour? Within this context, we make two main recommendations for future research. First, there needs to be greater clarity made in terms of definitions in future research. Specifically, does the educational practice look to the art or the science paradigms, and in what measure do these approaches impact on the learning journey? Second, longitudinal studies should to be undertaken that map the ongoing career paths of students to their educational experience. These should aim to ascertain what levels of transferability can be attributed to the two differing pedagogical styles.

In addition, future research avenues might include the dichotomy between non-entrepreneurially-oriented people and entrepreneurially-oriented people and the extent to which learning outcomes in experiential entrepreneurship education are effective for either group. Building upon calls for more ‘mixed methods’ research in entrepreneurship education (Blenker et al, 2014), in this journal, future research avenues could include robust in-depth qualitative interpretive analyses, but also need to be supported by equally rigorous and more generalizable quantitative methods. Combining these methods in one study would help to address some of the still unanswered questions in this theme that have been identified by various prior studies.

References

Anderson, A.R. and Jack, S.L. (2008), “Role typologies for enterprising education: the professional artisan?”, *Journal of Small Business and Enterprise Development*, Vol. 15, No. 2, pp. 259-273.

Binks, M., Starkey, K. and Mahon, C.L. (2006), “Entrepreneurship education and the business school”, *Technology Analysis & Strategic Management*, Vol. 18, No. 1, pp. 1-18.

Blenker, P., Dreisler, P. Meibom Faergemann, H. and Kjeldsen, J. (2008), “A framework for developing entrepreneurship education in a university context”, *International Journal of Entrepreneurship and Small Business*, Vol. 5, No. 1, p. 45-63.

Blenker, P., Elmholdt, S.T., Frederiksen, S.H., Korsgaard, S. and Wagner, K. (2014), “Methods in entrepreneurship education research: a review and integrative framework”, *Education + Training*, Vol. 56, No 8/9, pp. 697-715.

Carey, C. and Matlay, H. (2010), “Creative disciplines education: a model for assessing ideas in entrepreneurship education?”, *Education + Training*, Vol. 52, No. 8/9, pp. 694-709.

Cheng, M.Y., Chan, W.S. and Mahmood, A. (2009), “The effectiveness of entrepreneurship education in Malaysia”, *Education + Training*, Vol. 51, No. 7, pp. 555-566.

Collins, L.A., Smith, A.J. and Hannon, P.D. (2006), “Applying a synergistic learning approach in entrepreneurship education”, *Management Learning*, Vol. 37, No. 3, pp. 335-354.

Cooper, S., Bottomley, C. and Gordon, J. (2004), "Stepping out of the classroom and up the ladder of learning: An experiential learning approach to entrepreneurship education", *Industry and Higher Education*, Vol. 18, No. 1, pp. 11-22.

Dainow, W. (1986), "Training and Education of Entrepreneurs: The Current State of the Literature", *Journal of Small Business and Entrepreneurship*, Vol, 3, No. 4., pp. 10-23.

Daly, S.P. (2001), "Student-Operated Internet Businesses: True Experiential Learning in Entrepreneurship and Retail Management", *Journal of Marketing Education*, Vol. 23, No. 3, pp. 204-215.

Desplaces, D.E., Wergeles, F. And McGuigan, P. (2009), "Economic gardening through entrepreneurship education: A service-learning approach", *Industry and Higher Education*, Vol. 23, No. 6, pp. 473-484.

Dewey, J. (1938), *Experience and Education*, Collier, New York.

Edelman, L.F., Manolova, T.S. and Brush, C.G. (2008), "Entrepreneurship Education: Correspondence Between Practices of Nascent Entrepreneurs and Textbook Prescriptions for Success", *The Academy of Management Learning and Education*, Vol. 7, No. 1, pp. 56-70.

Edwards, L-J. and Muir, E.J. (2005), "Promoting entrepreneurship at the University of Glamorgan through formal and informal learning", *Journal of Small Business and Enterprise Development*, Vol. 12, No. 4, pp. 613-626.

Garavan, T.N. and O'Conneide, B. (1994), "Entrepreneurship education and training programmes:: a review and evaluation – Part 1", *Journal of European Industrial Training*, Vol. 18, No. 8, pp. 3-12.

Gorman, G., Hanlon, D. & King, W. (1997), "Some Research Perspectives on Entrepreneurial Education, Entrepreneurship education and Education for Small Business Management: a Ten Year Review", *International Small Business Journal*, Vol. 15, No. 3, pp. 56-77.

Gundry, L.K. and Kickul, J.R. (1996), "Flights of Imagination: Fostering Creativity through Experiential Learning", *Simulation & Gaming*, Vol. 27, No. 3, pp. 334-349.

Hamidi, D.Y., Wennberg, K. and Berglund, H. (2008), "Creativity in entrepreneurship education", *Journal of Small Business and Enterprise Development*, Vol. 15, No. 2, pp. 304-320.

Hannon, P., Brooksbank, D., Gray, C., Fuller, T., Jarvis, R., Keogh, B., Kirby, D. & Sear, L. (2004) *Making the Journey from Student to Entrepreneur: A Review of the Existing Research into Graduate Entrepreneurship*, National Council for Graduate Entrepreneurship: Birmingham.

Hannon, P., Scott, J.M., Martin, L., Reddy, S. & Millman, C. 2006. "The state of education provision for enterprise and entrepreneurship: A mapping study of England's HEIs", *International Journal of Entrepreneurship Education*, Vol. 4, pp. 41-72.

Hannon, P.D. (2005), "Philosophies of enterprise and entrepreneurship education and challenges for higher education in the UK", *International Journal of Entrepreneurship and Innovation*, Vol. 6, No. 2, pp. 105-114.

Hannon, P.D., Collins, L.A. and Smith, A.J. (2005), "Exploring graduate entrepreneurship: a collaborative, co-learning based approach for students, entrepreneurs and educators", *Industry and Higher Education*, Vol. 19, No. 1, pp. 11-23.

Hartshorn, C. and Hannon, P.D. (2005), "Paradoxes in entrepreneurship education: chalk and talk or chalk and cheese?: A case approach", *Education + Training*, Vol. 47, No. 8/9, pp. 616-627.

Heinonen, J. (2007), "An entrepreneurial-directed approach to teaching corporate entrepreneurship at university level", *Education + Training*, Vol. 49, No. 4, pp. 310-324.

Heinonen, J. and Poikkijoki, S-A. (2006), "An entrepreneurial-directed approach to entrepreneurship education: mission impossible?", *Journal of Management Development*, Vol. 25, No. 1, pp.80-94.

Henry, C., Hill, F. & Leitch, C. (2003), *Entrepreneurship Education and Training*, Ashgate, Aldershot.

Henry, C., Hill, F. and Leitch. C. (2005a), "Entrepreneurship Education and Training: Can Entrepreneurship Be Taught? Part I", *Education + Training*, Vol. 47, No. 2, pp. 98-111.

Henry, C., Hill, F. and Leitch, C. (2005b) "Entrepreneurship Education and Training: Can Entrepreneurship Be Taught? Part II", *Education + Training*, Vol. 47, No. 3, pp. 158-169.

Hindle, K. (2001), "Entrepreneurship education at university: The Plus Zone challenge", *Small Enterprise Research*, Vol. 9, No. 2, pp. 3-16.

Honig, B. (2004), "Entrepreneurship education: toward a model of contingency-based business planning", *Academy of Management Learning & Education*, Vol. 3, No. 3, pp. 258-273.

Hytti, U. and O'Gorman, C. (2004), "What is "enterprise education"? An analysis of the objectives and methods of enterprise education programmes in four European countries", *Education + Training*, Vol. 46, No. 1, pp. 11-23.

Hytti, U., Stenholm, P., Heinonen, J. and Seikkula-Leino, J. (2010), "Perceived learning outcomes in entrepreneurship education: The impact of student motivation and team behaviour", *Education + Training*, Vol. 52, No. 8/9, pp. 587-606.

Ibrahim, A.B. and Soufani, K. (2002), "Entrepreneurship education and training in Canada: a critical assessment", *Education + Training*, Vol. 44, No. 8/9, pp. 421-430.

Jack, S.L. and Anderson, A.R. (1999), "Entrepreneurship education within the enterprise culture: Producing reflective practitioners", *International Journal of Entrepreneurial Behaviour & Research*, Vol. 5, No. 3, pp.110-125.

Jones, C. and English, J. (2004), "A contemporary approach to entrepreneurship education", *Education + Training*, Vol. 46, No. 8/9, pp. 416-423.

Kickul, J., Gundry, L.K., Barbosa, S.D. and Simms, S. (2010), "One style does not fit all: the role of cognitive style in entrepreneurship education", *International Journal of Entrepreneurship and Small Business*, Vol. 9, No. 1, pp. 36-57.

Kolb, D.A. (1984), *Experiential Learning: Experience as the Source of Learning and Development*, Prentice-Hall, New Jersey.

Krueger, N. F. (2007), "What lies beneath? the experiential essence of entrepreneurial thinking", *Entrepreneurship Theory and Practice*, Vol. 31, pp. 123–138.

Kuratko, D.F. (1989), "New Venture Creation: A Laboratory Course for Entrepreneurship Education", *Journal of Education for Business*, Vol. 64, No. 6, pp. 248-250.

Leitch, C. & Harrison, R.T. (1999), "A Process Model for Entrepreneurship Education and Development", *International Journal of Entrepreneurial Behaviour & Research*; Vol. 5, No. 3, pp. 83-109.

Lewin, K. (1942), "Field theory and learning" in Cartwright, D. Ed. *Field theory in social science*, Harper and Row, New York, pp. 60-86.

Lewis, K. and Massey, C. (2003), "Delivering enterprise education in New Zealand", *Education + Training*, Vol. 45, No. 4, pp. 197-206.

Matlay, H. (2008), "The impact of entrepreneurship education on entrepreneurial outcomes", *Journal of Small Business and Enterprise Development*, Vol. 15, No. 2, pp. 382-396.

Matlay, H. and Carey, C. (2007), "Entrepreneurship education in the UK: a longitudinal perspective", *Journal of Small Business and Enterprise Development*, Vol. 14, No. 2, pp. 252-263.

McMullan, W.E and Gillin, L.M. (1998), "Developing technological start-up entrepreneurs: a case study of a graduate entrepreneurship programme at Swinburne University", *Technovation*, Vol. 18, No. 4, pp. 275-286.

Mitchell, R.K. and Chesteen, S.A. (1995), "Enhancing entrepreneurial expertise: experiential pedagogy and the new venture expert script", *Simulation & Gaming*, Vol. 26, No. 3, pp. 288-306.

Penaluna, A., Coates, J. and Penaluna, K. (2010), "Creativity-based assessment and neural understandings: A discussion and case study analysis", *Education + Training*, Vol. 52, No. 8/9, pp. 660-678.

Peterman, N. E. and Kennedy, J. (2003), "Enterprise Education: Influencing Students' Perceptions of Entrepreneurship", *Entrepreneurship Theory and Practice*, 28: 129-144.

Pittaway, L.A. and Cope, J.P. (2007a), "Simulating entrepreneurial learning: integrating experiential and collaborative approaches to learning", *Management Learning*, Vol. 38, No. 2, pp. 211-233.

Pittaway, L. and Cope, J. (2007b), "Entrepreneurship education – a systematic review of the evidence", *International Small Business Journal*, Vol. 25, No. 5, pp. 477-506.

Pittaway, L. and Edwards, C. (2012), "Assessment: examining practice in entrepreneurship education", *Education + Training*, Vol. 54, No. 8, pp. 778-800.

Pittaway, L., Hannon, P., Gibb, A. and Thompson, J. (2009), "Assessment practice in entrepreneurship education", *International Journal of Entrepreneurial Behaviour & Research*, Vol. 15, No. 1, pp. 71-93.

Rae, D., Martin, L., Antcliff, V. and Hannon, P. (2010), "The 2010 Survey of Enterprise and Entrepreneurship in Higher Education", paper presented at the 33rd ISBE conference, London, November.

Robinson, P.B. (1996), "The Minefield Exercise: "The Challenge" in Entrepreneurship Education", *Simulation & Gaming*, Vol. 27, No. 3, pp. 350-364.

Shepherd, D.A. (2004), "Educating entrepreneurship students about emotion and learning from failure", *Academy of Management Learning & Education*, Vol. 3, No. 3, pp. 274-287.

Solomon, G. (2007), "An examination of entrepreneurship education in the United States", *Journal of Small Business and Enterprise Development*, Vol. 14, No. 2, pp.168-182.

Solomon, G.T., Weaver, K.M. and Fernald, L.W. (1994), "A historical examination of small business management and entrepreneurship pedagogy", *Simulation & Gaming*, Vol. 25, No. 3, pp. 338-252.

Taatila, V.P. (2010), "Learning entrepreneurship in higher education", *Education + Training*, Vol. 52, No. 1, pp. 48-61.

Tan, S. and Ng, F. (2006), "A problem-based learning approach to entrepreneurship education", *Education + Training*, Vol. 48, No. 6, pp. 416-428.

Tracey, P. and Phillips, N. (2007), "The distinctive challenge of educating social entrepreneurs: a postscript and rejoinder to the Special Issue on Entrepreneurship Education", *The Academy of Management Learning and Education*, Vol. 6, No. 2, pp. 264-271.

Tunstall, R. and Lynch, M. (2010), "The role of simulation case studies in enterprise education", *Education + Training*, Vol. 52, No. 8/9, pp. 624-642.

Vij, V. (2014), *Exploratory Study into Entrepreneurship Education: Awareness and Impact upon Science, Engineering and Technology (SET) Undergraduates*, unpublished PhD thesis, Northumbria University: Newcastle.

Vij, V. and Ball, S. (2010), "Exploring the impact of entrepreneurship education on university nonbusiness undergraduates", *International Journal of Entrepreneurship and Small Business*, Vol. 9, No. 1, pp. 86-109.

Table 1: Assessment Types – Implementation and Innovation

Implementation – assessment types	Innovation – assessment types
Can the student write and follow a business plan?	Can the student respond positively to short term and ever changing venture environments
Can the student come up with a good idea?	Can the student come up with multiple ideas that respond to changing circumstances?
Does the student’s solution match the expectation of the test or exam?	Does the student’s solution surprise through new insights and alternatives?
Does the student respond to the problem identified by the educator?	Does the student identify new problems and opportunities for themselves?
Is the solution correct, finite and complete in the view of the educator / evaluator?	Is the solution part of an ongoing process of prototyping that responds to stakeholder feedback?
Can the solution be easily compared and contrasted to previous work and understandings?	Does the solution offer new insights and potentially challenge accepted understandings?
Can the student adhere to the use of accepted theories and practices when undertaking an assignment?	Can the student experiment and self-define a range of theories that support or argue against their findings?
Does the student follow the rules carefully when developing a solution?	Does the student compare their solutions to rules and adapt accordingly?
Does the solution require significant resource?	Is the solution testable in a lean environment, and is it potentially scaleable?
Does the assessment look to past understandings?	Does the assessment look to support new understandings?
Does the assessment look to past contexts?	Does the assessment consider future and unknown contexts?
Does the leadership style in the task (teamwork) require decision-making by the manager?	Does the leadership style in the task (teamwork) require the management of an inclusive decision making process?

Source: Penaluna and Penaluna (2015)