



Measuring entrepreneurial self-efficacy to understand the impact of creative activities for learning innovation



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ARTICLE INFO

Article history:

Received 27 January 2014

Received in revised form 11 April 2014

Accepted 20 May 2014

Available online 16 June 2014

Keywords:

Entrepreneurship education

Self-efficacy

Measuring impact

Creativity

Innovation

ABSTRACT

It has been argued that if increased entrepreneurial activity is the outcome objective, then self-efficacy provides a legitimate and robust construct that can be used to evaluate the impact of entrepreneurial education (Barakat, McLellan, & Winfield, 2010). This is because self-efficacy influences the motivation and ability to engage in specific activities (Bandura, 1977) and is a strong, necessary condition of creative productivity, and in discovering new knowledge (Bandura, 1997). Although the concept of self-efficacy can be used as a promising tool to understand creativity and has been practically tested by Tierney and Farmer (2002), entrepreneurial self-efficacy (ESE) as a multi-dimensional construct remains under theorized. The aim of this paper is to provide details of a study and methodology in order to offer an example of a usable survey tool plus preliminary results from the data collected through a specific project called CAL4INO. Creative Activities in Learning for Innovation (CAL4INO) is a European Union funded project that focuses primarily on identifying the impact of different types of learning activities on the innovation potential of participants. CAL4INO aims to review different education and training methods and explore the impact different programmes have on entrepreneurship and innovation both in the short ~~term~~ and long term. As part of this research a survey tool has been validated that measures different factors of entrepreneurial self-efficacy (ESE). Further, the relationship between different dimensions of ESE are considered to build a better understanding of the multi-dimensional structure of ESE.

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1. Introduction

Creativity is viewed as central to entrepreneurship (Timmons, 1994) and entrepreneurial intentions (Hamidi, Wennberg, & Berglund, 2008). Many entrepreneurial programmes now include learning activities designed to make the student think and act more creatively. As education in this area moves away from more traditional approaches it is no longer sufficient to measure courses by how well they teach students to write business plans or complete case study assignments or on student feedback, employability and financial returns. Creative learning activities aim to change the very behaviour of individuals as creativity is strongly associated with entrepreneurship and innovation (Amabile, 1997). There is a need for a new type of

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measurement. With the growing number of creative learning activities now being taught there is a need to better understand what impact they are having and if they are filling the theoretical remit of making individuals more creative, innovative and entrepreneurial.

Creative Activities in Learning for Innovation (CAL4INO), a European wide, EU funded project aims to investigate the role of creative learning activities to enhance innovation within the context of entrepreneurship. The rationale behind this is that people as teams, not lone “geniuses”, develop meaningful innovations by blending designs, technology and business through creative activities synthesizing diverse perspectives, experiences and skills. To study and measure such activities, instruments need to be flexible enough to measure any creative learning activity that aims to enhance innovation and by extension, entrepreneurial activity. The Centre for Entrepreneurial Learning at the University of Cambridge was (and continues to be) responsible for designing and developing tools that are capable of studying and measuring creative learning activities that aim to enhance innovation. Over the duration of the CAL4INO project a range of different programmes have been measured that use a mixture of different approaches. The overall aim of the tool is that by analysing and comparing different creative learning activities it will be possible to enhance innovation at the technical, social and institutional level. The tool must be sufficiently robust to compare and measure a range of different creative learning activities across Europe. It must also be adaptive and sensitive to the different socio-cultural contexts, interdisciplinary and cross-sector nature of the study so that it is possible to compare creative activities across these boundaries. Within the study reported here, a tool was used to measure educational initiatives using creative activities to enhance innovation. Further categories were supplemented to allow for the measurement of enterprise and entrepreneurship education in general.

The chosen method of measurement chosen was entrepreneurial self-efficacy (ESE). ESE is defined as an individual's own belief in his/her skills and abilities linked to entrepreneurial activity. It stands among the important personal factors that influence the abilities and chances of entrepreneurs as it is a prerequisite for these groups to persist in their daily activities and in the achievement of their goals. It is no surprise that ESE has been receiving an increasing amount of attention in the literature (for example [Chen, Green & Crick, 1998](#); [Forbes, 2005](#); [McGee, Peterson, Mueller, & Sequeira, 2009](#)). ESE has been identified as having a role in new venture creation ([Barbosa, Gerhardt, & Kickul, 2007](#); [Boyd & Vozikis, 1994](#); [Chen, Greene, & Crick, 1998](#); [Zhao, Siebert, & Hills, 2005](#)) and is seen as an important antecedent to entrepreneurial action ([Chen et al., 1998](#)). Positively influencing self-efficacy can hence be a major goal in entrepreneurship education, especially with regard to promoting self-belief on efficacy in producing innovation and staying creative throughout the cumbersome innovation process.

Despite the growing body of literature, ESE remains empirically underdeveloped ([McGee et al., 2009](#)) with many calls for further refinement (for example [Forbes, 2005](#); [Kolvereid & Isaksen, 2006](#)). There is a lack of understanding of the multi-dimensionality of ESE as the dimensionality of the construct has yet to be fully established ([McGee et al., 2009](#)). Therefore further work is needed to explore and determine the different dimensions of ESE.

This paper focuses on the design, implementation and validation of the survey tool (using both exploratory and confirmatory factor analysis) and preliminary findings. This is a valuable and powerful tool as it provides entrepreneurship educators with a tool to understand the impact of different learning activities. The first section will focus on the background work to the tool in terms of defining creativity and innovation and also previous work on how to measure the impact of enterprise and entrepreneurial courses. This will be followed by a discussion of ESE, the chosen construct used for measurement and therefore provides a context for the tool validated in this paper. Before moving on to showing how the tool has been validated and some preliminary results from data gathered for the CAL4INO project.

2. Defining creativity and innovation

The first issues in measuring the impact of enterprise and entrepreneurship programmes is defining ‘what is being measured?’: ‘how do we define creativity in relation to innovation?’. Given the remit of the CAL4INO project an understanding of creativity for innovation is required that is contextualized within entrepreneurship. One major issue, as [Kaufmann \(2003\)](#) notes, is that there is a lot of research that has focused on a “‘bottom-up’ perspective, where development of tests of creativity have taken priority over the clarification of basic conceptual and theoretical issues.” ([Kaufmann, 2003](#), 236) Without defining basic conceptual and theoretical constructs there is a real danger of undermining any tool.

Referring to creativity, there are numerous models for creativity and a definition has been a matter of debate for decades, this is a complex issue and one that is not detailed here (for more detailed discussion refer to [Berg, 2011](#)). For the purposes of designing a measurement tool the project team began by debating and researching the concept of creativity. While any definition of creativity is fraught with controversy, creativity in general can be defined as: “The development of a novel product, idea, or problem solution that is of value to the individual and/or larger social groups” ([Hennessey & Amabile, 2010](#)). General consensus in the field supports this definition (See also, [Fisher & Amabile, 2009](#); [George & Zhou, 2001](#); [Sternberg, Kaufman, & Pretz, 2002](#); [Tierney, Farmer, & Green, 1999](#)).

Research has also indicated that creativity has a heuristic character within which, not only is the outcome novel, so too is the process within which it is created ([George & Zhou, 2001](#), 514). Within team creativity it is argued that creativity involves interaction between individuals and environment ([Sternberg et al. 2002](#)). Further, given the rise of technology and specialization, creativity has become more a product of organizational effort than lone geniuses ([Fisher & Amabile, 2009](#)).

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