CAN CURRICULAR ENTREPRENEURSHIP EDUCATION DEVELOP ENTREPRENEURIAL SUCCESS FOR GRADUATES? A TEN YEAR LONGITUDINAL STUDY

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Abstract:
This abstract presents the results of ten year's research completed with students of all disciplines, with over 3000 who developed Entrepreneurial competencies within their degree discipline and a control group of 1000 students who did not study Entrepreneurship in any form. The purpose of the research was to measure the Entrepreneurial competency development of students and any entrepreneurial outcomes at graduation, two years, five years and ten years after graduation. A research questionnaire based on the author's "E-Factor" competency model was designed in conjunction with a leading Occupational Psychologist and these were administered at the requisite stages. The paper highlights the key results of the longitudinal study: Students who had undertaken the Curricular Entrepreneurial training had improved their "E-Factor" score significantly in comparison to the control group not only at graduation but at each stage of the study. There was a direct correlation between the level of Entrepreneurial competence and the extent of their curricular Entrepreneurial learning. There was also many more businesses started by those who had received curricular training than by those who were members of the control group .The more experiential the pedagogy the more impactful the Entrepreneurial Learning.

Keywords: competencies; entrepreneurship education; pedagogy

1. INTRODUCTION

The author over a ten year period worked with over 30000 students and over thirty academic staff to design and implement a curricular Enterprise Education project on a cross campus basis to all disciplines throughout Queens University Belfast .The project was driven by a broad policy directive from the UK Government that students needed to be more "innovative and entrepreneurial" with particular reference to successful US "entrepreneurial universities" for example MIT who had created a number of highly successful high growth businesses from staff and student based projects. There was also an awareness at the highest level that all UK students needed the skills of the Entrepreneur to compete in the global economy. One of the challenges was that there were very few exemplars anywhere in the world where Entrepreneurship had been embedded into the curriculum of all students and indeed into the entire student experience, but only small "pockets of good practice". Many of the large research based universities who had successful commercial spin outs were highlighted as role models, however in many cases their success was based on one or two staff research spin outs with very little infrastructure to reach all students. A recent report by the MIT Skoll Entrepreneurship Institute (2014) highlighted that large research spin out income was only one aspect of the "entrepreneurial university" and did not meet the needs of the vast majority of students needing to develop "an entrepreneurial mindset" to compete in the global economy.

After reviewing existing practice the author who was appointed to lead Entrepreneurship education at Queens University Belfast in 2002 decided to design and implement his own cross curricular model. He hoped to reach students on a cross campus basis and to help them develop entrepreneurial competencies and develop an entrepreneurial ecosystem. This would allow students to develop enterprise competencies, have a new venture experience and they would be given the opportunity to be involved with co-curricular activity to develop their innovations and capabilities further.

It was also important to measure the number of students who undertook curricular activity and the impact of the education with regard to its educational value and any direct results such as the number of business and social enterprises started up by the students. The author designed a new Entrepreneurship education model based on ten year's research with entrepreneurs which had highlighted eight competencies which all entrepreneurs needs to survive in the global economy and in particular were required in the constantly changing working environment of the entrepreneur. The model was called the "E-Factor" competency model (Gibson 2006) and it became the basis of curriculum design and pedagogical development of a number of cross campus curricular initiatives to be embedded within the curriculum. Although it was relatively straightforward to measure the impact in terms of the funders' requirements, it was felt for long term impact and learning that the longitudinal impact should be measured over a ten year period to provide meaningful rigorous data for policy purposes.

A research questionnaire based on the "E-Factor" model was administered to all students undertaking the curricular Entrepreneurship both before and after the course and on a large sample of the participants (3000) over the ten year period and to a control group of 500 students who did not undertake the curricular Entrepreneurship Education. A random sample of thirty students formed a focus group to provide detailed qualitative data over the ten year period.

This paper focuses on the results of meetings with the group of thirty over the ten year period although it is important to state that the quantitative data from the 3500 sample provided impact evidence in line with the results highlighted in this paper.

Before reviewing the literature and the research results, it is important to explain the details of the "Elvis Model" which incorporates the "E-Factor" competency teaching model but was designed specifically in an attempt to enhance the effectiveness of the Entrepreneurship education project on a longitudinal basis.

2. THE ELVIS MODEL

As mentioned above "ELVIS" was an attempt to create a working Entrepreneurship Education model which would not only help students develop the competencies and mindset to become more entrepreneurial but produce measurable results both on a short term but also on a long term sustainable basis.

The author and Queens University Belfast have won many awards for the model and the short term impact it achieved. This included the University being named " Times Higher Entrepreneurial University of the Year UK 2009"and the author winning fifteen awards including the first UK National Teaching Fellowship in 2007 from the Higher Education Academy, "The Most Innovative Teacher in the UK" 2011, the World Number One Enterprise Educator Award in 2011 and the first OBE ever awarded by the UK Government for Enterprise Education in 2012. However does the longitudinal research evidence highlight that the participants have achieved long term results directly as a result of having experienced the curricular model?

"ELVIS" is an acronym of the key components of the Entrepreneurship Education Curricular Education system designed and implemented at Queens University Belfast in 2002.

E stands for *the embedding of entrepreneurial competencies within the curriculum*.

The Eight Competencies embedded into the teaching and learning were as follows
1. Creativity.
2. Resilience
3. Personal Influence
4. Financial Mastery
5. Leadership and Team work
6. Negotiation and Assertion Skills
7. Personal Branding
8. Strategic Action

Every student in every degree pathway had to undertake at least one compulsory module during their degree where they would be assessed on their development of the competencies and the reflection on their learning. It was felt that as the model was innovative and represented a significant change both in curricular content and in pedagogy that educators would need to use the very competencies they were teaching. Students who graduated having completed a module with these competencies embedded graduated with the "Queens Certificate in Entrepreneurship Studies". By 2009 over 85 percent of all Undergraduates were achieving this on graduation which is a measure of the amount of students who were involved in the programme. It provided a large dataset to research over a period of time.

L stands for *linking up the Entrepreneurship education model with the rest of the Entrepreneurial Ecosystem both within and outside the University*. This includes further co-curricular activity with student societies and enterprise projects within the University and also linking with all relevant agencies and a large sample of entrepreneurs within the region and internationally.

V stands for *verifying the outcome of all enterprise activity in the curriculum both short term and long term* as educational activity, the teaching learning and assessment would have to be measured as Higher Education best practice and educators would need to review the feedback from students. Numbers participating and any short term results would need to be fed back to funders and other university stakeholders. Public Sector policy developers, funders and other stakeholders also need research based evidence that the model works on a sustainable basis.

Without evidence the likelihood is that most funders and universities will only invest in Enterprise Education models on a short term basis limiting the potential impact of any Enterprise Education carried out. Educators despite the practical nature of the project had to work together to research and publish findings as this is critical in providing verifiable evidence to University Senior Management and the Funders of the University. Longitudinal research data is considered the most rigorous evidence of success by all stakeholders.

I stands for *institutional support and innovative pedagogy*. Without institutional support from a senior level any curricular project is unlikely to have a long term future. Most innovative Entrepreneurship education projects are funded on a short term basis externally with the need for the institution to fund the next stage of the project on a permanent basis. Does the curricular project fit in with the strategic plans of the University? If not, this is also likely to impact on its long term impact and indeed existence. Innovative pedagogy and assessment are vital to ensure that students acquire not only knowledge but also the entrepreneurial competencies and attitudes needed. University module leaders are under pressure to ensure research is embedded in the curriculum and that the module and its teaching and

assessment have rigour. However it was felt in the design of the ELVIS project that students need to be inspired and to learn by doing. Ocinneide et Al (1994) confirmed in their study of Irish Higher education that it was possible to develop creativity and a belief amongst students that they could make things happen. There were very few modular examples that met up with this within the UK Higher Education system in 2003 but fortunately there are now a few case studies with guidance from the QAA (2012) who have recognised the need for appropriate pedagogy and assessment in teaching in this area. The emphasis of the "Elvis" teaching model was getting engagement with the students, providing experiential experience and a chance to reflect on experience rather than simply reviewing literature on its own.

S stands for *student and stakeholder marketing*. The objective of the new cross campus Entrepreneurship education was not for students to learn about Entrepreneurship but to complete entrepreneurial projects within their own disciplinary areas and to develop the competencies and self-efficacy to create and implement projects. It was felt that the curricular modules were vital to ensure that all students got the chance to develop these competencies and also to find out about further projects and opportunities outside the curriculum. This led to the deliberate inclusion of meeting with outside stakeholders and to at least a limited amount of co-curricular activity. Traditionally most of the student base is not reached outside the curriculum and it was vital to provide relevant and inspirational teaching and an opportunity for independent learning within the curriculum as all students at all levels were registered on the Certificate in Entrepreneurship Studies. There was a need to build the profile of the modules and the success stories and ensure they were highlighted both within internal communications and also with all the stakeholders both within and outside the University Ecosystem. A commitment was made to constantly develop the programme based on student and alumni feedback, student feedback on the module and alumni who were now working were encouraged to provide feedback on the benefit of the curriculum and the pedagogy on their career and constructive feedback for module development.

The outline of the ELVIS project highlights the features of the project and the plan for its strategic development. One of the problems was there were very few exemplars of working cross campus enterprise projects and very little research evidence. It was necessary to create a project that had clear objectives, best educational practice and that could be measured both on a short or long term basis.

The standard reporting systems to university management and external funders provided short term evaluation. Long term longitudinal data measurement provided a more structured and rigorous measurement of sustainable impact with practical and policy considerations.

3. LITERATURE REVIEW

One of the challenges in learning from the literature was that there is a lack of applied studies in this area, in particular regarding developing a compulsory campus wide curricular project because educators have been unable to make these projects happen and there is also a dearth of published research in Enterprise Education, particularly on curricular non business school interventions. The work of Gibb (2005) does provide excellent guidelines of best practice on cross curricular Enterprise Education without any evidence or evidence based strategy on making it happen on a Campus wide basis. Hannon (2007) also highlighted the fragility of UK Higher education Enterprise Education provision. Pittaway, L and Hannon, P (2008) reviewed potential institutional strategies despite the lack of proven successful models that can be rolled out particularly within the UK context.

Indeed ten years ago Henry et Al posed the significant question can Entrepreneurship be taught? which remains a perennial issue as it is still unclear whether this is indeed a challenge or simply more difficult to achieve for academics who have excellent knowledge about the literature on Entrepreneurship but neither the practical experience or pedagogical skills to create a high impact entrepreneurial experience or indeed the capacity to learn to deliver it. Certainly the work of Jones (2011) and Thompson, Scott and Gibson (2010) highlighted the importance of Entrepreneurship education being grounded on a student learning model, whilst the challenges that the enterprise educator faces was discussed by Carey and Matlay (2011) without any evidential data on how specifically to address these issues. Lewis (2011) and Blenker P et al (2011) both concurred in the view that the development of an entrepreneurial mindset needs to be the core objective of university Entrepreneurship education. Lewis (2011) also reviewed the challenges of

developing Entrepreneurship education for all students whilst there is a lack of high level research in this area.

Broadly the literature highlights the challenges that Enterprise Education faces and provides examples of potential models and what universities should do. What is needed are well researched longitudinal examples which prove what institutional and pedagogical strategies can work in practice and are transferable to other institutions. This paper will provide longitudinal qualitative evidence and will be used in conjunction with further quantitative evidence to provide a model which will increase the likelihood of any educator with appropriate professional and academic training being able to produce excellent student focused campus wide curricular Enterprise Education in all universities.

Wilson (2012) whilst accepting the need for the measurement of Enterprise Education gave the following proviso "if enterprise culture which is the essence of successful Enterprise Education is to be measured, It cannot be a simple process; it requires a rigorous and comprehensive study, engaging with students and universities during the process." What is clear is that major Policy makers need research evidence to inform policy and to create a long term plan to keep Enterprise Education at the core of learning and development in all activities.

4. THE RESEARCH METHODOLOGY

The author recognised an outstanding opportunity at Queens University Belfast to design a unique curricular model as when he arrived in 2002 the University had a small cohort of students studying traditional Entrepreneurship and the University was coming under pressure to justify its results based on the High level Investment form OFSTED four years earlier to promote Entrepreneurship Education. There was a need to design and implement a Campus wide curricular system as soon as possible. The opportunity to work with many thousands of students in the curriculum from all types of disciplines provided an outstanding longitudinal opportunity to measure impact and learning and provides rigorous results for policy to share with future international educators. A research questionnaire was designed based on the E-Factor model outlined above and it was issued to every student undertaking an Enterprise Education based module before the first session and after the last session. The author picked two samples to follow over a ten year period and selected thirty students who were undertaking the modules, and we planned to re-administer the questionnaire at the end of the module; two years, five years and ten years afterwards. He created a random focus group who would meet at each juncture for an afternoon at each stage of the research project to produce learnings and results not only to shape existing curriculum but a ten year longitudinal study that would provide significant data and clear outcomes good and bad for each participant. In addition a group of three thousand students would complete the questionnaire over the same time period. Their results would be compared with a group of five hundred students who did not do the curricular enterprise modules.

This paper focuses on the results of the qualitative sample. The thirty students were picked randomly with ten from the Engineering Faculty, ten from the Science Faculty and ten from the Faculty of Humanities. They were all final year students as in the early years of the project a university committee that the author reported to only allowed modules to be designed and embedded for final year students. It was relatively straightforward to keep in touch with the group as they were enrolled on the Curricular Certificate in Entrepreneurship Studies.

5. DETAILED RESEARCH METHOD

There was no attempt for the author to lead the group other than to ask them to complete the questionnaires and to provide an opportunity to share experiences and opinions with the clear proviso that they were encouraged to reflect on the impact of the curricular module on their working life throughout the ten year period. The results were very significant and provide excellent learning to share with educators and policy makers. The results are arranged into a number of areas to provide maximum learning.

The sample all increased their overall scores over the ten year period. The most significant increase was before and immediately after the programme and two years afterwards although there was still increases after ten years to show that with this limited random sample that the entrepreneurial results

not only improved immediately after the enterprise education but also on a sustainable basis leading to the conclusion that the sample had been changed by the intervention.

The four areas where the sample showed significant weakness before the module was in their creativity, resilience, personal branding and financial acumen. There was almost a 30 percent average increase in all these areas immediately after the module was completed. This increased by a further 10 percent after two years and by a further eight percent by the end of the ten year study. There were also significant increases in developing strategic action but an average eight percent increase for leadership, negotiation and personal influence.

Although the questionnaires were administered at each stage this was to provide additional evidence to the Qualitative data provided by the focus group. The competency development increase outlines have a strong correlation with the large Quantitative sample to be reviewed in a different publication.

6. THE MAIN BENEFITS OF THE PROGRAMME

The group felt that the programme had developed their belief that they could start up a business as and when they wanted to. They were much more resilient and ready to tolerate ambiguity in the work place. They all felt they had developed both their creative skills but also understood their own personal strategy of being creative. They were prepared to promote both themselves and their companies and put themselves forward for opportunity. They were more relaxed and aware of strategies pertaining to raising funding and to understand the importance of money in most business situations. They had found it a shock in their modules to be more than passive recipients of the research knowledge of lecturers but all felt that their action orientation had increased as a result of the module. They also felt that that the entrepreneurial learning methodology made them capable of making much more impact in whatever work situation they were in. They all felt they had a significant advantage in developing innovative projects in their career.

7. THE PEDAGOGY

Initially they had found the pedagogy very unusual and not in line with what they had experienced not only through their university degree but also in secondary education. They found the style of learning inspirational and responded well but worried if this was proper education if they were doing things and having fun. They also learned that they would continue to learn post university and were willing to create ideas, implement and in many cases learn from failure. This was not something they had experienced before. Two of the comments of the group highlighted the focus of the group:
*"The best teaching I have had in my three years in Queens. Unbelievable!!!!"*Third year Nursing Student

"The most impactful teaching session in my life" Pharmacy graduate five years after the teaching experience

"The entrepreneurship teaching strategies inspired me to set up my multimillion tourist business within three years of Graduation" Computer Science Student

8. SELF EFFICACY

This was perhaps the key variable in that all focus group students felt that this had increased for them immediately and continued to grow over the ten year period As one History student indicated:

"I feel the programme and the method of learning increased my capacity and my belief that I was an enterprising graduate and that I could make impact within the workplace almost immediately."

9. LINKING MODULES TO CO-CURRICULAR ACTIVITY

The focus group found it strange that part of their assessment for their module was linked to finding out about student enterprise projects and making a contribution to their success. 86 percent of them found this unique method very useful.

"It enabled me to link law, enterprise theory and human rights. I got involved with Enactus. And became an elected member of the Student Union Management Centre", Third year Law student.

"I found the "come outside" message fascinating. I learned about Social Enterprise Projects and ultimately became Head of Student Enterprise and am now a Senior Manager for Innocent Foods running their entrepreneurial investments Not a likely " destination for an Engineering student", Third Year Mechanical Engineering student

The consensus was that they recognised the benefit of this linked approach and were initially driven by the fact that they were being assessed on this area and thus paid attention and the engagement developed further in many cases.

10. STARTING BUSINESSES

The Focus group indicated that they got the message that Enterprise Education went way beyond start up.

"What I liked was that I became streetwise about starting a business and had the skills to create and start a new venture either within a company or as a small business".

However 42 percent of the focus group had started their own business by the end of the ten year period and one had created a millionaire spin out business. The other 58 percent were in Senior Management jobs for which they attributed their Entrepreneurial training within the curriculum as a significant factor. The one exception was a Business student who was now completing a PhD and was determined to become an "Entrepreneurial Researcher"!!!

11. ANY OTHER FINDINGS

Almost a tenth of the focus group wanted at some stage to become a full or part time enterprise educator .They all felt that students should have curricular enterprise education from year one to ensure they made the most of the opportunities that the University experience provided.

Over 90 percent indicated that they felt that all Universities must have educators who had practical experience with clear expertise in entrepreneurial learning. They indicated that they had picked up the view that the enterprise educators seemed to be treated as second class citizens to pure researchers within the university system and felt they wanted more transparency about this. They felt that parents and careers advisers should have access to this research evidence in their choice of universities.

12. FUTURE DIRECTIONS

The results from the focus group show clear longitudinal benefit from this type of project. There is now a need to provide detailed statistical analysis from the Quantitative data and test it for correlation with the Focus group evidence.

When the results from this longitudinal study highlight the benefits, it is hard to understand that why after over twenty years there are limited curricular interventions and research data to help educators and universities to create campus wide interventions for maximum impact. There is no doubt that the conclusions of Penaluna, Gibson et Al (2008) remain valid "Entrepreneurial Education needs Entrepreneurial Educators." Perhaps in addition to researching further applied interventions there is a need for much more than the present training and support system for educators because their success is not only predicated by their teaching and their curricular design but by having training and mentoring for a longer period to negotiate the obstacles that a university as a large bureaucratic organisation will present them if they are to achieve the sustainable impact clearly needed.

This research has indicated that good curricular education has significant longitudinal validity and it is likely that the next stage of the research project will offer both related and further findings. Policy makers must listen to enterprise educators who have had significant experience in creating cross campus curricular education for the vast majority of a University population and develop a new approach otherwise it is unlikely they will produce an adequate number of innovative graduates to compete in the global economy. Universities have to respond to funding and the needs of key

stakeholders. If Policyholders accept that enterprise education has significant role to play, they must ensure that this policy is turned into practice.

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