How Fascinating! An entrepreneurial learning initiative

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ABSTRACT

Entrepreneurial learning is being suggested as a valuable model for tertiary education in the 21st century. For those teaching Information Technology, the need to match the requirements of a rapidly changing workplace and technological environment to ensure graduate employability is not new. However, the application of these ideas to the pedagogy they use is less widely followed or understood. This paper describes how a traditional compulsory course within a Bachelor of Information Technology was transformed from a rather dry and uninspiring format to one which is enjoyable and engaging by applying many entrepreneurial techniques to its delivery and assessment. The approach employed was radical and risky but appears to have reaped a number of benefits which are discussed in some detail together with the underlying philosophy which allowed this experiment to progress.

Categories and Subject Descriptors

K 3.2 **[Information Systems Education]**

General Terms

Design

Keywords

Entrepreneurial education, assessment design

1. INTRODUCTION

Deriving initially from the notion of teaching entrepreneurial skills, the concept of 'entrepreneurial learning' may be a promising strategy for the rapidly changing environment of current education and educational institutions. At least one tertiary educational institute in New Zealand, Nelson Marlborough Institute of Technology (NMIT) is developing an entrepreneurial learning framework to guide future course development and delivery and to provide an aspirational target for creating authentic, relevant and engaging learning situations and experiences.

Since 2009, the Digital Technology teaching team at NMIT had supported the idea of 'serious fun - serious learning' [2] as the basis of their teaching philosophy. This had resulted in various initiatives including the very successful concept of IT Challenge Week which had always been intended to be a "starting point for re-thinking some of the more traditional educational activities" [1, p.28]. This paper details how a serendipitous blend of current staff thinking, a short term staff shortage and a compulsory but unpopular subject resulted in a fortuitous entrepreneurial learning

approach to the design and delivery of a first year degree course.

2. BACKGROUND

For several years, an ongoing and lively conversation between the Digital Technologies teaching staff at NMIT concerned ways in which learning situations could be developed and assessed which engaged and encouraged students, provided relevant and authentic learning experiences and which both students and staff found interesting, motivating and fun. The team believed and the success of Challenge Week had shown, that providing students with interesting, challenging and largely self-directed activities helped them to engage with important and necessary content and that this was the model of learning that we wanted our students to follow. However, in some respects the Challenge Weeks modelled the idea of 'serious fun, serious learning' too well. Some courses did not meet the expectation that was created and the staff felt a sense of frustration at not being able to maintain the same approach consistently throughout the year. While other educators (e.g. Seely Brown [10]) appeared to support the approach staff wished to take, including an increasing interest in both games and gamification in education, the notion of the 'flipped classroom' and the ubiquitous adoption of technology, there was little guidance on how to bring this together into a coherent and cohesive whole. Consequently, staff were inclined to trial different ideas and approaches in isolation but often retreated to more traditional methods of both delivery and assessment when faced with a shortage of time or other resources.

In 2012, NMIT introduced its commitment to entrepreneurial learning via its official Investment Plan 2013-201 saying "[w]e endorse a new learning paradigm aimed at developing the working capabilities of individuals and organisations, based on the concept of 'entrepreneurial learning' - breaking down the divisions between education, practice and work within 'real world' learning experiences" [9, p.8]. Among a number of possible strategies to achieve this NMIT suggests that they will encourage activities that "...take students further than technical skills alone by the development of creative and innovative capabilities...", "...integrate innovative problem-solving, self-directed learning and enterprise principles within courses..." provide "training for the real world by learning in the real world" and "teach and test students on attributes other than technical skills" [9, p. 43].

However, as others have noted (e.g. Erdelyi [3]) "there is no consensus in the literature on how to define a single identifiable phenomenon called 'entrepreneurial learning.'" While it is often seen as teaching entrepreneurs, for example by situating the education "within the actual workplace or simulated contexts that provide them with opportunities to apply what they have learned while taking action, to accumulate their first-hand experience and to reflect upon experience" [8, p.549] there is a growing recognition that teaching the **skills** of entrepreneurship (e.g. risk-taking, self-motivation, self-discipline, teamwork, perseverance) to all students is valuable in and of itself [11]. Partly in response

to the economic difficulties in Europe, the European Union has been highlighting the importance of "developing 'entrepreneurial mind-sets' … in which education and training are the key drivers" [4, p.11]. There is also an emerging notion of applying an entrepreneurial approach to the pedagogy itself and it would appear that the NMIT commitment is attempting to cover all these interpretations.

The Digital Technologies teaching team at NMIT has been guided by many of the principles of entrepreneurial learning for some years. A student's final year project is often an industry-based placement or client driven project, many course assessments are rooted in industry-based case studies or driven by industry training schemes, and several activities, such as support for the student computer network and laptops, require students to engage in 'real world' learning experiences. However, entrepreneurial learning is not just about 'learning by doing' or learning how entrepreneurs succeed, it is also about learning to take risks, learning by failing and learning by gradually achieving mastery over a set of skills. As any online gamer will attest, failure is an excellent way of promoting learning by encouraging innovation and determination to succeed but only when the consequences of that failure are manageable [5, slide 14], the motivation to succeed is high and the possibility of eventual success seems likely. As one blogger wrote, "we don't get better to avoid failure, we fail in order to get better" [6, online]. Learning to embrace failure and learn from it promotes self-confidence and encourages the learner to act with "intelligent optimism" [12, online] rather than responding to their negative inner voice [13].

Creating the environment in which this kind of learning can take place is the primary challenge for aspiring 'entrepreneurial educators' but this alone is not enough. If there is a real desire to change the educational paradigm, it is essential that the means by which success is assessed and measured, also change. In an entrepreneurial educational environment, success can no longer be measured by striving for 'perfect' outcomes; the notion of a model answer is dead! Instead, success must be focussed not on the quality of the final outcome but on a student's ability to develop and experiment with various strategies, learn from both their failures and successes and to reflect critically on both. Providing a safe environment in which students can fail at no cost is not enough. It is the practice of risk taking, the practice of failure, and in particular the practice of avoiding future failure through critical analysis of new knowledge which must be rewarded if students are to respond to the challenges of entrepreneurial learning.

Somewhat serendipitously, discussion around these issues and the continued redevelopment of a problematic first year degree course coincided with the viewing of an inspirational video of Benjamin Zander, the conductor of the Boston Philharmonic Orchestra [13]. In this talk, Zander relates how in one class that he teaches all students are awarded an A grade at the start if they write him a forward dated letter from their future selves explaining what they did to receive such a grade. A number of ideas flowed from this video including the notion of removing the negative inner voice, removing the anxiety about meeting some ill-defined measure of success, and the self-evident but usually ignored fact that levels of required attainment and the grades attached to them are essentially arbitrary and artificial. As a result, the Digital Technologies team agreed to experiment further with the course, to test both student and staff reactions to a new approach and to learn more about the potential of taking a more 'agile' approach to teaching and learning. With institutional support and approval, the team adopted the attitude that while the experiment might not achieve its intended goals, nevertheless useful lessons would be learned along the way.

3. THE PROBLEM

The introduction of a new degree programme in 2011 had resulted in a new course "Information Technology in Context" (ITC501) appearing as a compulsory first year paper for all students on the Bachelor of Information Technology. The rationale for the course was to create a context for IT study, particularly as some of the younger students would have had little experience of the world in which much of their IT work would eventually be situated. It had been agreed that students needed to have a grounding in professional practice, ethics and basic business practices in order to make sense of their learning in other classes. Although having a worthy intent, the course had proved to be something of a trial. For students, excited to be starting IT study it seemed dry and irrelevant and while staff understood the need for the course it was seen as a chore rather than an exciting opportunity.

Underlying the overt intentions of the course also lay a hidden agenda which addressed the nature of IT professional life, e.g. self-motivation, problem-solving, solution seeking, constant learning, information evaluating, appropriate communication, awareness of online dangers and affordances, and the nature of tertiary IT student life, e.g. taking responsibility for learning, rising to challenges, working alongside others in an open and honest way, deep learning rather than grade-driven superficial achievement.

As a compulsory first year, first semester course, ITC501 also potentially offered a way to continue the challenges of Challenge Week, something regarded as an important pathway by the team. The retention of new students in the first few weeks of their degree study was a primary focus and with an energised, interesting, engaging format it was believed that this course could provide a way of allowing students to both 'find their feet' and begin to appreciate the excitement of working in the IT area.

4. THE SOLUTIONS

The redesign of ITC501 currently falls into two phases. The redevelopment process had begun in 2012 when a temporary staff shortage resulted in there being no one available to teach the course. Consequently a new approach to both delivery and assessment was introduced. In 2013 the format was refined by a recognised awareness of the principles of entrepreneurial learning and the vision of Zander [13].

4.1 Year 1 - 2012

4.1.1 Delivery

With no staff member able to take full responsibility for the course, the team agreed to a work sharing arrangement. One person became the course facilitator and all staff members took responsibility for one or more topics lasting one or two weeks. In effect the teaching was crowd-sourced and staff from other related areas were also invited to participate. A long list of appropriate topics based on staff interest, including those deemed compulsory by the official learning outcomes of the course, was constructed. Each staff member chose one or more topics, agreed the duration of each topic (generally 1 or 2 two hour sessions) and committed to providing (and eventually assessing) a short set of questions or activities that students would be required to complete.

4.1.2 Assessment

Each student was required to create a personal WordPress blog and a Google document. For each topic, the student detailed the relevant activities as one or more blog postings. Some of the posts were mandatory, i.e. those covering specific learning outcomes and others were optional. At the end of the semester, the student provided the URL of all the individual blog posts that they wished to be assessed in their Google document. Apart from the five required posts, they were asked to choose 3 additional ones that they felt were their best. The relevant staff then marked each post using a predefined rubric and the facilitator provided a mark of certain aspects such as regularity of posting. These marks were then totalled to provide an overall grade for the course.

4.1.3 Review - staff

In terms of delivery, staff were happy with this arrangement and welcomed the chance to engage and inspire students with a wide range of IT issues about which they were both knowledgeable and passionate. The topics ranged from Security to Social Media, from Digital Behaviour to Virtual Worlds and from Open Source Software to Copyright. Through these sessions, all staff had the opportunity to interact with both new and returning students and it fostered the sense of community which Challenge Week had initiated. The assessment format was less successful and the marking process was hard to organise and was not straightforward. It also came much too late in the semester to provide useful information to students and a number of students marginally failed who may well have succeeded with more timely feedback. There were others who fell between the cracks and although monitoring of the blogs should have provided a means of catching problems early, the approach was not sufficiently systematic or organised.

4.1.4 Review - students

Anecdotally, the students mostly welcomed the range of teaching styles and topics that the format provided and several remarked that they felt they now 'knew' the staff much better and would be better prepared when meeting them in subsequent courses. Some of them also commented in their blogs that the course was opening up their eyes to aspects of IT that they had never considered before and that this 'taster' of things to come was both interesting and motivating. However, the frequent change of staff and the different length of topics did produce some confusion at times and there was a perceived lack of continuity. Once again it was the assessment that proved problematic. One student remarked that as the assessment came at the end of the course they were trying to hit a target that they couldn't see. They had no reliable means of gauging what was needed to pass the course and as a result some students devoted far more time than was needed while others, of course, did too little. More consistent and timely feedback was definitely needed. The opportunity to exercise some control over what would be assessed was welcomed but encouraged some students to deliberately miss certain sessions and topics. Likewise, as directed work was set on a weekly basis, too many students came to rely on a mechanistic approach to meeting what they hoped would be a sufficient standard.

All in all, this offering of the course was certainly more successful than the previous, rather dry and uninspiring traditional version. However, there were certainly still a number of areas for improvement.

4.2 Year 2 - 2013

4.2.1 Delivery

In the second year, the notion of crowdsourcing the teaching was maintained although this time the course facilitation role was strengthened and one staff member took overall responsibility for the course in a way that hadn't been possible before. Each week, the facilitator would take one 2 hour session while a team member took the other. This provided significantly more continuity for students as they knew they would see the course facilitator at least once a week and it allowed the facilitator to play a much more active role in monitoring students' progress, providing timely feedback and encouraging and following up with students who appeared to be struggling. The topic areas were similar to the previous offering but restricted to one two hour session and once again staff provided direction on what should be covered in the student's weekly blog post.

4.2.2 Assessment

The major difference in this offering was in the way in which the course was assessed and graded. Based on Zander's inspiration, all students were told in the first class that they had received an A+ for the course. However, to have the A+ awarded they had to meet two requirements. Firstly, they had to write a formal letter to the facilitator dated six months ahead explaining what they had achieved to warrant this excellent grade and secondly, they had to complete 12 of 15 blog posts over the course of the semester to a standard acceptable to the staff member responsible for the topic. This required the student to make the posting within 3 days of the topic being presented and required the staff to read and respond to all the blog posts relevant to their topic within a short time-frame (usually 3 days). All the staff member had to do was to leave a comment indicating if the post was acceptable and if not, what needed to be done to bring it to the required level. In the following session, the facilitator would work through any issues from the topic, check the comments on the students' blogs and assist them in taking any necessary remedial action.

4.2.3 Review - staff

In terms of delivery, this arrangement differed little from the previous year and much of the previous preparation was reusable. In general, each staff member was responsible for fewer sessions and the course facilitator took a much greater role on a weekly basis. The redesigned assessment however, required a different and more focused approach. It was important for the successful flow of the course that each week's posts were read and responded to before the facilitator's session in the following week. In practice that meant that a topic was delivered on a Friday, the student blog post had to be in place by the following Tuesday morning and the staff member had to record their comments on each blog by the Thursday morning. This could be quite a challenge for both staff and students at times! Nevertheless, the process worked reasonably smoothly with most able to work within these deadlines - some tolerance was shown to those who couldn't, although the facilitator did have to spend some time chasing those who fell behind. One advantage for topic staff was that their involvement in the course was largely over, once the blog posts had been assessed. No frantic last minute marking was required at the end of the semester.

For the facilitator, there was clearly an increased workload. There was the responsibility for ensuring that students stayed on track, often working with individuals in his class sessions and also ensuring that posts had been responded to. Where a post was

recorded as not of an acceptable standard, he was also responsible for ensuring that the additional work was completed and signed off. However, the final processing at the end of the semester was significantly easier and many students knew several weeks before the end that they had successfully completed and gained their A+.

4.2.4 Review - students

The new delivery schedule provided some advantages for students. There was increased clarity about the structure of the course and a clear continuity provided by the facilitation sessions. Attendance and engagement at the topic sessions was consistently high despite the Friday afternoon timeslot. The majority of students had little problem with managing the time commitment of regular blog posting and even for those students who did fall behind, catching up was possible. There was some disbelief and scepticism about the awarding of an A+ in Week 1 but after the initial excitement it no longer became an issue. The target was reasonably clear and became clearer each week as the students gained an understanding of what was considered acceptable. This allowed the highly motivated, grade-driven students to relax and enjoy the course while those who struggled could see that even if they didn't always make the grade the first time they still had a reasonable chance of success. This was in keeping with the idea that if the motivation to succeed is high, failure will be learnt from and overcome if eventual success seems attainable.

Retention in the class was good with no withdrawals after the initial three weeks and with an 89% successful completion rate. Students had timely, formative feedback on their weekly posts and the opportunity to, in effect, resubmit their work. On most occasions this opportunity was taken when needed but as only 12 out of a possible 15 posts were required, students could decide to abandon one that was of less interest to them or one with which they had struggled. Students were also offered the option of providing an audio or video version of their post rather than a requiring a written one.

The notion of a post being 'acceptable' was an interesting one which actually represented an individual contract between the staff member and the student. No rubric was provided and staff were free to judge for themselves what they considered to be acceptable. Of course this was specific both to the staff member and to the topic but it was also determined to some extent by the student. Just over half the students on the course were completely new to either NMIT or the IT degree while the others were second or third year students who needed this compulsory course to fulfil graduation requirements. Clearly, final year students could be expected to have a significantly more sophisticated view of some of the topics under discussion and while never articulated or perhaps even consciously acknowledged as such, staff appeared to require a higher quality of work from them to meet the 'acceptable' standard.

The overall quality of the work ranged from those who just managed to meet the standard to those who clearly excelled but there was no longer a long tail of those who had clearly given up nor a small spike of those who had clearly spent far too long chasing the 'perfect' score. In general, the quality of the work was more even and consistently improved throughout the semester without creating peaks of stress.

4.2.5 Review - general comments

The anecdotal feedback from staff and students was positive and the general format of the course will be used again next year.

The team believes that this new approach has transformed what was a dry, unengaging but essential course - described by one staff member as an exercise in 'educational drudgery' - into a vibrant, dynamic experience which all participants have enjoyed. Students are encouraged to explore certain topics in more depth, are exposed to a variety of teaching styles and passionate interest and can experience the pleasure of studying without the stress of constantly trying to second guess what is required to succeed.

However, it was possible to achieve this for a variety of reasons relating to the course itself, the enthusiasm and open-mindedness of the teaching team and institutional support. Recognising that the context of IT would change, often quite significantly, from year to year, the learning outcomes for the course had been deliberately constructed to allow for a broad interpretation. At the same time although the course was compulsory for the degree it was not a prerequisite for any other course. No other course was relying on this one to provide the learning of specific content, however, all other courses would be relying on it to provide useful general skills, e.g. time management, the habit of regular study, improving communication skills and being aware of tailoring communication to particular audiences, creating a cooperative and collaborative learning community, ethical professional practice and common business terminology.

The Digital Technologies teaching team understood and supported the purpose behind the approach. They had already experienced and enjoyed the results of a number of Challenge Weeks and had confidence that this kind of approach engendered a healthy and effective environment for, and attitude to, learning. There were clearly risks involved in adopting the approach (e.g. students not accepting the same grade philosophy, disagreement within the team about 'acceptable' standards) but it was considered that they could be mitigated by clearly managing students' expectations of the course. This required an openness with both the students and the institution. Students were told that this was an experiment and that if it seemed to be failing, they would play an active part in helping to find an acceptable solution. Relevant academic committees and personnel were informed before the course began of the team's intention and approval was given, if somewhat sceptically at times.

5. THE RESULT

Has the experiment been a success? This is hard to answer as the team did not draw up any particular criteria to measure success by. Clearly there were some obvious indicators including attendance, pass and retention rates, all of which would be a measure of student engagement with the course. However, there are also other measures which are far more difficult to quantify such as the impact on student learning in other concurrent classes, the development of self-directed learning skills, increased persistence and curiosity, a move to deep rather than superficial learning, an improvement in critical thinking and reflective skills and an increased recognition in the value of openly sharing learning through public writings. Many of these criteria emerged during the delivery of the course itself and no formal measurement had been put in place for them.

Due to changes in the recording of course statistics, it is difficult to provide a true comparison of pass and retention rates. However, as far as can be ascertained, the pass rates have shown a significant improvement over the last three years. In 2011, when the original traditional course was offered the pass rate was approximately 62% with a very high number of withdrawals. In

2012, the first new offering yielded a pass rate of 72% and, while there were fewer withdrawals, there were still a number of students who dropped out before the end of the semester. In contrast, 2013 saw a pass rate of 89% and no withdrawals after the first three weeks. Even the small number of students who didn't complete successfully only missed by a small number of posts. The 2013 offering also had very high attendance rates which would support the conclusion that the students both enjoyed the course and its delivery.

While there may be a number of additional topics that could be included and possible further refinement of the assessment process, the team believes that in essence, the format for the course is one which is worth reusing and it will be offered in a similar way in 2014. It would be useful to articulate more clearly the less tangible effects that the team are hoping to achieve and include a number of evaluation measures to establish whether it is meeting them. Plans are in place to consider the use of badges to reward the underlying skills and to provide a persistent record of learning over and above the required outcomes. It is also hoped that the experience of the course will provide both confidence and strategies for reworking the team's approach to the more traditional courses within the programme.

6. CONCLUSION

It isn't just the landscape of education that is changing, it is the entire topography. The traditional model of what we teach, how we teach and how we measure success is correctly being challenged.

While there is always some factual knowledge that is important to memorise (for convenience if nothing else), our almost immediate access to a global resource of knowledge makes much fact retention redundant. How we find the relevant knowledge, how we judge and evaluate it, how we relate the context of the found knowledge to the context in which we use it, and how we do all that efficiently and competently is much more important.

How we construct new knowledge is also changing. The trial and error approach of practical application has long been recognised as a successful learning mechanism, as has the more structured and guided approach to task completion by following a set of steps. In an educational context however, both of these have generally been teacher led or instigated. The concept of challenging students to find their own solutions and create their own new knowledge with little direction seems risky and failure prone. Yet the need to create knowledge, either new, or new to the individual, is now recognised in the value placed on life-long learning and is an essential component of it. There is also a growing recognition that learning is a social activity – that we learn best, not in isolation, but in learning with and from others. Collaboration and cooperation, acting within a team, connecting with others for mutual learning are all part of building this life-long learning community.

Coming to grips with these changes is not about how to use technology in the classroom or how to design online courses – it is about understanding that technology is bringing about a fundamental shift in the way we learn and in the way we construct and use knowledge. This understanding has to transform how we teach and even more importantly how we assess and reward the learning. We have to reassess what we value as educators and how we can assess that. There is little to be gained by changing how we provide learning experiences for students if we continue to reward memorisation, perfect outcomes and individual achievement. We need to reconsider and redesign our assessment and reward systems just as thoroughly as we do our teaching [7].

The notion of agile entrepreneurial learning provides one possible model for creating relevant, engaging and valuable education for 21st century learners for whom the prospect of 'one life - one career' may well be as antiquated as the 20th century schoolroom. In this period of educational transition, teachers have to experiment with such models and be given the freedom and permission, as they must in turn give their students, to fail, to reflect on, learn from and share those failures and to try again. In true entrepreneurial spirit and as Zander [13] suggests, failure needs to be met with the response of "How fascinating! What's next?"

7. ACKNOWLEDGEMENTS

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