Calibrating Entrepreneurship Education for a Constantly Changing World

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Abstract: A key purpose of education has long been to ensure that students are well prepared for the workforce. In an unchanging context where tasks, roles, and expectations are stable, creating an education program that prepares students for the workforce can be achieved relatively easily, and once in place will remain appropriate if the context is stable. The challenge is in educating students for work environments that are rapidly changing and where the expectations placed on them are uncertain and ambiguous. The concept of calibration is the process of ensuring something is in tune or in sync in the intended way. An example from music would be calibrating an instrument to ensure it generates the intended notes. The same approach can be applied to education to ensure that educational approaches used are in tune with the requirements of students who enter the workforce. This research therefore sought out students who had graduated from two master's programs and had been in the workforce for less than a year to better understand what skills and education they felt were missing from their education and what skills they felt their education had provided. In short to hear how well equipped the students felt and whether the program was calibrated to their needs, in carrying out this research it highlighted several conundrums relevant to all entrepreneurship educators.

Keywords: entrepreneurship education, practical pedagogy, career preparation, employability

1. Introduction

The world is far from stable, and in the rapidly changing environment of new technologies, global health scares, and newly started wars many people find themselves transitioning from studying to working (Fernandes and Afonso, 2020). These kinds of environments are those in which entrepreneurs have traditionally operated and arguably thrived in. Entrepreneurs are antifragile in that the greater the instability the more they tend to thrive in the environment that challenges more static operators (Taleb, 2012).

The question of how to educate people for these environments is one that has garnered considerable attention, and innovation and entrepreneurship education (EE) programmes have been put forward as one context that can be particularly helpful (Fernandes and Afonso, 2020, Bacigalupo et al., 2016). Going through an entrepreneurial learning processes leads to the development and demonstration of entrepreneurial competencies (Kubberød and Pettersen, 2018, Lackéus, 2014, Morris et al., 2013). Entrepreneurial competencies have been defined as 'knowledge, skills and attitudes that affect the willingness and ability to perform the entrepreneurial job of new value creation' (Lackéus, 2014, p. 377). While a definition of entrepreneurship in a higher education context "is about making students more creative, opportunity oriented, proactive and innovative, adhering to a wide definition of entrepreneurship relevant to all walks in life" (Bacigalupo et al., 2016).

Scholars have highlighted that those who study entrepreneurship often do not start their own firm, or at least not initially (Killingberg et al., 2020, Neck and Corbett, 2018). Instead they often end up working for large organisations in the early stages of their career. While preparing students for an uncertain world is important, what skills they need is still open for clarification (Pittaway and Cope, 2007).

Studies highlight skills such as creativity, problem solving, innovation skills, general business knowledge, team working skills, interpersonal skills and learning skills – competencies frequently associated with EE – are valuable to employers (Lowden et al., 2011, Wickramasinghe and Perera, 2010, Bacigalupo et al., 2016). Yet scant evidence exists about whether students are equipped with these skills at the end of their education in entrepreneurship (Killingberg et al., 2020). Mwasalwiba (2010) explicitly called for more research on the links between EE and workplace context, a call which has largely gone unheeded.

We do not wish to suggest there is no research on this subject, as prior studies do exist that explore entrepreneurial competencies developed through EE (Lackéus, 2014, Kubberød and Pettersen, 2018, Morris et

al., 2013). Yet these do no specifically look at the alignment between skills developed through EE and the skills needed for those who directly enter the workforce after their studies. There are also studies looking at skills developed from individual courses (Fernandes and Afonso, 2020, Lynch et al., 2019). However, there seems to be room for further exploration at the study programme level. We therefore undertake a qualitative explorative study. Our research question is therefore, in what ways do students feel prepared for their initial career choices and the ways do they feel underprepared. The results highlights that students feel mostly prepared, but the data raises interesting conundrums relevant for all those involved in delivering entrepreneurship education.

2. Established perspectives

The growth in EE and the proliferation of courses is not necessarily due to so many students wanting to start businesses but rather by the skills and capabilities that develop through EE, which are transferable to all types of organizations and career endeavours (Neck and Corbett, 2018). Being entrepreneurial and having an entrepreneurial mindset is not solely isolated to starting a business, but is more of a general life skill (Costello et al., 2012). Indeed there is a misnomer that it is not legitimate entrepreneurship if you end up working for someone else and that some people feel like making the choice to work for others might somehow be perceived as failure (Costello et al., 2012). Yet there has long existed an acknowledgement that professionals struggle with innovation and particularly in bridging new technologies and business (Thursby et al., 2009). In this sense preparing individuals, who plan on entering into the workforce, to be more entrepreneurial is an important task of EE (Neck and Corbett, 2018).

In a study examining the use of design thinking (DT) in a masters entrepreneurship program, Lynch et al., found that students developed what they labelled as tangential skills. Based on student reflections and interviews the study examined what it was that students were learning from DT. The students named the obvious elements connected to the DT methodology, but most of the reflections were focussed on other elements such as dealing with ambiguous challenges, the challenges of teamwork and communication. The authors labelled these skills as 'tangential' in that they were not the intended learning outcomes based on the course description, yet these so-called tangential skills were some of what the students considered to be most important and valuable. Which highlights that EE education is not always about traditional learning, but rather about preparing students for the 'soft skills' they will need in the workplace. While this highlights the role of EE in helping students develop soft skills, the study says nothing about whether these skills are relevant for the workplace, or whether students carry these skills into the workforce.

One of the key arguments as to why EE represents a good study direction for students is because it prepares students for rapid changes, different challenges and uncertainty in work life. Increasingly, all organizations are experiencing demands for rapid change and various challenges in the work of developing and surviving. This points to an interesting challenge for educators, what students' needed when the study program was designed might not be the same as what is appropriate for the current changing context. In setting a research agenda for the connection between EE and preparing for a future career, Killingberg et al. (2020) highlight a number of propositions that they argue to be true. The overriding theme is that EE is well suited to training students for shifting environments because the skills trained are not for static environments, but rather environments where they are required to adapt quickly (Neck and Greene, 2011). We therefore sought to investigate in an explorative manner whether students felt well prepared for their early careers.

3. Study context

This study was carried out across two masters' programs in Norway. The two programs are a Masters of Innovation & Entrepreneurship at the Norwegian University of Life Sciences (NMBU) and Masters of Innovation and Entrepreneurship at the Western Norway University of Applied Sciences (HVL). Both programs are relatively small, with yearly enrolments of around 30 people per year. The master program at HVL recruit students with a bachelor's degree in engineering science or natural science, and the master program at NMBU recruit students with a variety of bachelor backgrounds.

The study programmes can be typified as practical based study programmes where there is a strong emphasis on learning through doing (Lackéus, 2015) and socially constructed learning through reflection groups (Burgoyne, 1995). Many of the assessments on program are based on reflection notes where students are asked to use theory to reflect on their practical experiences in projects.

The programs are closely aligned in both their teaching style and stated aims. Both programs are not venture creation programs, but broad master's programs that educate for a larger labour market. Both programs include a combination of theoretical courses on innovation and entrepreneurship (education *about* entrepreneurship) and practice-oriented courses where innovative teaching methods "through" entrepreneurship are applied. These are process-based and often experiential approaches where students go through an actual entrepreneurial learning process and engage in project-based learning. The students work with real-life projects (own or others' ideas) and learn through student active learning in teams where they develop entrepreneurial skills. Through the practice courses, students are also given required knowledge and skills for pursuing entrepreneurship, such as knowledge about innovation methods etc.

4. Methodology

Interviews at one institution was carried out with a total of 7 students in a semi structured format, with 6 guiding questions and space given for students to answer in an open way. An additional 4 responses were gained from students who were unable or unwilling to attend an interview and therefore chose to respond in a written format. Similarly, at the second institution, a total of 4 students were interviewed in a semi-structured format. Making the total basis for the study 11 interviews which ranged from 25 minutes to 1 hour. The participants were made up of 4 men and 7 women, with 8 participants under the age of 30, 1 participant between 30 and 35 years old and 1 between 36-45 years old.

The semi-structured questions were focussed on asking students to answer in relation to their current job. The results of these questions were recorded throughout the interview and were checked after the interview for fullness and clarity. Based on these written results (and those sent in directly), the data was examined for common and recurring themes. These themes are highlighted in our data section and expanded upon during the discussion. The interviews and data analysis were carried out in Norwegian, with key quotes then translated by one of the authors who is a native English speaker. The translation was then checked by a second author whose mother tongue is Norwegian.

We wish to highlight that all of the authors work on the two entrepreneurship programmes from which graduates interviewed had attended. We acknowledge the likely bias this has caused, but consider our insider perspective to be valuable in the pursuit of better understanding the rich environment in which we attempt to study (Van Maanen, 2011, Watson, 2011). Social researchers are part of the world they study (Hammersley and Atkinson, 2007), and their orientations both within and outside the area of interest is an unavoidable reality (Paechter, 2012). Even as insiders in the study programs, the process of researching our own program challenges this status of being an insider (Humphrey, 2007; Taylor, 2011; Watts, 2006). Labaree (2002) suggests that, while the mainly outsider researcher has to 'go native' in order to understand the local culture, insiders have to, by corollary, to 'go observationalist', distancing themselves introspectively from phenomena. We have aimed therefore to balance the inevitable and valuable situation of being insiders with the need to be 'observationalist' in our approach. Here we use the term 'observationalist' in the sense that it suggests distance and objectiveness from the data, not in the sense of visually watching activities. Our research design reflects this attempt at balancing distance and closeness through using an explorative method where we asked open questions. This was to create sufficient space for graduates to discuss that which they felt was relevant, without trying to lead them down the path of having them confirm the propositions we ultimately were interested in. Which this resulted in a data that was not always relevant, we found it to strike a balance between being 'on topic' and not 'leading the witness' towards answering in a way we desired.

5. Data - Results

We have chosen to structure the data section in linear order of the questions asked. We wish to highlight that this is an explorative study, therefore the data is intended to highlight areas for further research.

Q1: Which tasks or processes do you feel well prepared for based on what you learnt in your studies/ master program?

PROGRAM 1 key points:
I felt well prepared to tackle stress and difficult situations
The entrepreneurial attitude we learnt in our studies helped me to quickly tackle new work tasks
It wasn't scary to meet others businesses, such as those working in the area of environmental certification of framing timber or others areas I have never heard of before

I feel safe in meeting new people
I feel like I have a sense of independence, resilience and drive
All of the students also mentioned that they felt well prepared for their first job after studying
PROGRAM key points:
I felt well prepared to start own innovation project or startup (soft and hard skills)
I felt well prepared to work interdisciplinary - at the intersection of technology and economics
Well prepared to tackle challenges combining technology and business development
Motivation and self-efficacy to start own venture
Teamwork, interdisciplinary cooperation
All of the students also mentioned that they felt well prepared for their first job after studying

The result from Q1 was that most of the students felt well prepared for their first job and the task they were responsible to. The students were working in different organizations when it comes to size or complexity.

The second question had students answer which tasks or processes they felt underprepared, or poorly prepared for. Generally, the students seemed to struggle to answer this question, and instead many of them gave more positive answers about the ways in which they felt prepared. We highlight some of the common answers from students below.

Q2: Which tasks or processes do you feel underprepared, or poorly prepared for?

PROGRAM 1 key points:
One student highlighted that they felt underprepared for a different work culture (they worked in a Swedish firm that they said was more structured and process orientated than they were used to)
Implementation strategy and implementing/delivery phase of design thinking. As well economic analysis and profitability analysis.
How to work with people who are unwilling to change, or are unenthusiastic about reaching goals
Technical solutions in their particular field
Computation and data analysis.
How to collaborate with engineers
PROGRAM 2 key points:
I felt too light in economics and accounting (lack of skills).
More practice/training in facilitating groups (including specialists).
Practice/Training in different tools, methods and how to facilitate innovation workshops/projects easier
Lack of knowledge about formal requirements of establishing a venture

The results from Q2 highlight the common theme of needing greater technical competence, yet the students were working in different fields, meaning the technical competence relevant for one student was likely irrelevant to the rest. Soft skills around communication, culture and collaboration were mentioned by 3 students, however these mentions were related to specific scenarios, and less broad generalisable situations. 2 students would like to have more practice and training in classroom before entering real life cases/projects.

3) What should have been included in the masters' program which is currently not a part of the program

PROGRAM 1 key points:
The chance to interact more in person (Covid related). Openness in relation to group dynamics. More on sustainability.
Nothing. Were satisfied with the content and structure.
Financial knowledge
Even more environmental focus
Collaboration with engineers
PROGRAM 2 key points:
I'd like have more subject-specific topics, such as regulations / laws etc. In my job I've felt 'too light' / lack of competence in some areas
A lot of practice and a lot of theory in the master, but I would have liked a better connection by running several cases as a starting point to be trained on the theory.
More discussions and work in interdisciplinary teams where students are required to combine different perspectives in order to solve challenges.
More use of external business actors in teaching to bring in an 'outsider' perspective

Students seemed hard pressed to highlight areas that felt insufficient, with most students emphasising that they thought the current structure of the course was well designed and suitable for preparing them for the workforce. In highlighting the areas where a greater focus could have been placed most students added caveats to their answers that they understood these areas were not the key areas of focus for the masters' program.

Question 4 focussed on what students think should be dropped from the current study program. Three students from NMBU said the same answer here, which was one particular course on intellectual property rights. This course has already been removed from the master program. It is worth noting that students had earlier expressed their dissatisfaction with a teaching approach on this course that differed in pedagogy from the rest of the masters. In the final version of the course (before it was removed) a different pedagogy was used that was more in alignment with the entire program, resulting in positive students reviews in the course feedback. Students from HVL did not point to any particular elements which should be dropped from the current study program.

5) What was the best elements of the study program you took?

PROGRAM 1 key points:
The student culture in the class (mentioned twice)
Practical learning and use of innovative methods (mentioned three times)
Practical approach combined with theoretical support (mentioned twice)
The ability to choose much of the study direction themselves
Practical and useful work experience
PROGRAM 2 key points:
Writing the master's thesis had provided valuable training in writing and formulating long texts. This had been a useful and work-relevant experience (mentioned twice)
Work interdisciplinary teams
Network
Trained in cooperation and working in teams

The results from Q5 several students mentioned that practical approach and useful work experience as the best elements of the study program could give them. Two students mentioned that the work of writing the master's thesis had provided valuable training in writing and formulating long texts. This had been a useful and work-relevant experience.

The final question Q6 was left open to allow students to answer in a way that they could highlight anything else they considered important. The common themes were:

6) Is there anything else you would like to add?

PROGRAM 1 key points:
They enjoyed the practical elements
They would like to keep up contact with earlier and current students
That the program emphasised that there is no 'single' answers to many questions connected to innovation.
PROGRAM 2 key points:
Writing of master's thesis provided valuable experience
The master program provided students with motivation and faith in own capabilities to pursue entrepreneurship

The last question Q6 gave us just positive results and also showed differences and variations in experiences from the masters' programs.

6. Discussion

The general argument of Killingberg et al. (2020) was that an EE education prepares students well for entering the workforce. Our own examination generally supports this assertion. At the general level graduates relayed that they were content with the education they received and felt well prepared. Thus, suggesting there is general alignment between the education program and the needs of graduates, at least in the early stages of their career. While the authors welcome this generally positive result, this article is not intended as bragging or self gratulatory in the sense that the authors are closely connected to the program. Instead that aim was to consider whether EE is appropriate to the needs of those who plan on spending at least the initial part of their career in the workforce.

If we view the ideal education as a kind of target, then we could visualise the results of individuals courses as shots on target, and can begin to ask the question whether these shots are bullseyes or wide of the mark. The data gathered suggest most of these courses are landing on target, a perhaps more interesting philosophical question though is how do you prepare courses when the target is constantly shifting in an uncertain world. If you draw the analogy a step further, we can argue that actually in preparing courses we are firing shots on where a target was based previously and in doing so, an assumption is made that the target will continue to be relevant for the future. The reality though is that no educator has a crystal ball through which they can predict what will be relevant for tomorrow's EE students.
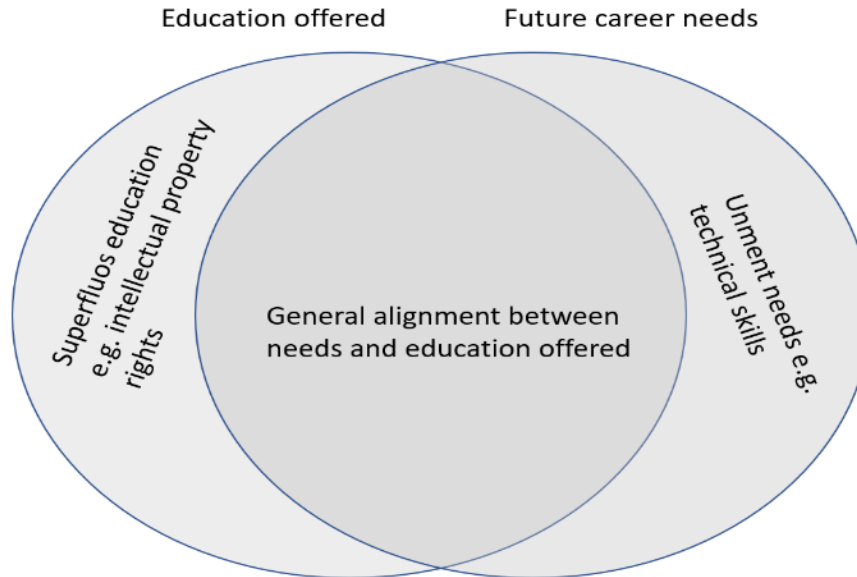
Education offered   Future career needs

Superfluos education e.g. intellectual property rights

General alignment between needs and education offered

Unment needs e.g. technical skills

Figure 1: Alignment of the EE content with career needs

One of the key points that arose from the data was this idea that graduates were generally happy with the study program in the way it had prepared them to have the right mindset or attitude in their work. The felt comfortable with new tasks and in interacting with other business representatives and colleagues (or at least those not in technical roles). The areas where they seemed to be most challenged though was in interacting with more technically specific elements of their role. If we consider the feedback to fall under context specific knowledge it raises a tension that exists with broad focussed entrepreneurship programs. That tension is that preparing students for different roles requires preparing them for a mix of soft skills and technical skills.

The soft skills tend to translate well across domains, but have traditionally been more challenging to teach and measure. While technical skills have traditionally been easier to teach but have a narrower range of applicability. In addition, there is greater variation in which specific technical skills are needed based on role and industry. This raises a tension between which technical skills to teach. In order to create alignment between needs of the future graduates and their study program, there needs to be knowledge of which career trajectory the person will take. Most young people seem to struggle with the question 'what will you do when you graduate' – which corresponds with a struggle at the program level to ensure that the education needs of that person is met. In addition, given there is variation in technical skills needed, then there is a larger chance that if technical skills are taught arbitrarily then they will not be relevant. Although there is evidence to suggest that some programmes are managing to find the balance between technical/hard and soft skills (Fernandes et al., 2017).

If the student is unaware of what career trajectory they will choose then selecting appropriate 'elective' courses (which currently exist in the program) will always be a challenge, and may in some ways come down to chance. One of the students mentions this stating that they 'guess they could have taken an elective', but this highlights that when this person was a student they obviously never saw the elective as being relevant. This comes as back to a central idea connected to innovation which is that of dealing with ambiguity and uncertainty, which is how best to prepare students for the unknown.

There are two possible solutions to this. The first is practising the skill of learning how to learn technical skills. This could be through courses designed to place students in unfamiliar technical complex situations, and have them learn how to come to grips with the field through self-directed study in a relatively quick way. There is evidence this can be done, and is perceived as valuable by students (Lynch et al., 2019).

The other alternative is to have EE incorporate future casting skills where students can apply DT skills to their own life and generate future career scenarios and prototype these career trajectories. There is a known example of such a course being run through Stanford's Life Design Lab. There are also courses called 'design your life' run through a private company. Both examples highlight a possible path forward to help students gain clarity about their own path forward, which in turn might correlate with a greater sense of agency about how they want to prepare for future career trajectories.

Both solutions aim to increasing a sense of agency and engagement from students in order to ensure they are well prepared for changing environments. Meta cognition has been labelled as one skill which is important in this regards, whereby students are not only taught knowledge but equally taught about the skill of learning how to learn (Haynie et al., 2010). That is through reflective practice they can increase their understanding of their own weaknesses, and develop strategies and learning plans on how to achieve the required knowledge (Burgoyne, 1995).

7. Limitations and further research

The limitations with this study are many including the small sample size, the explorative research method and the geographic isolation of the study only looking at Norway. As an explorative study though the intention was never to provide clear answers, but to begin the process of investigating whether EE is suitable to prepare students for careers inside industry. Further research could follow up these same students at later points in their career in an attempt to understand if their attitudes differ over time. In addition, the geographical location of the study should be broadened and the sample size increased.

8. Summary

This study looks at a small sample across two programmes. The data so far suggest that EE seems to be preparing students for their early careers and that students see their education as largely having been beneficial. Unsurprisingly they find areas for fine tuning with regards to calibrating the courses to their particular needs. The needs of each graduate differ and there was no strong overriding theme of something being missing from the studies or having been superfluous. The fine tuning relates to ensuring students have the requisite technical skills combined with the soft skills. In general, the data suggest they had strong soft skills, but that several of them highlighted differing areas of technical skills. As discussed, no one size fits all. Study programs can mitigate this challenge by ensuring a sufficient focus on learning how to learn or what is often labelled as meta cognition. As an exploratory study, this article highlights an under researched area with potential for further insights for the EE field.

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