

# **Role model interventions to motivate students to consider entrepreneurship as a career**

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## Ethical declaration

I declare that this thesis is wholly my own work except where I have made explicit reference to the work of others. I have read the DBA guidelines and relevant institutional regulations and hereby declare that this thesis is in line with these requirements. I have discussed, agreed, and complied with whatever confidentiality or anonymity terms of reference were deemed appropriate by those participating in the research and dealt appropriately with any other ethical matters arising.

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Date: 12/10/20  
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## **Abstract**

This thesis presents the findings of a mixed-methods research design used to examine if there is a link between role model influence and entrepreneurial intent. This research was undertaken by applying mixed-methods research in the researcher's own Higher Education Institute (HEI) organisation. Eighty-two fourth-year Biomedical and Mechanical Engineering students (male = 73, Female = 9) with an average age of 22.7 years (SD =3.3) consented to participate in the study. The study consisted of an initial investigation phase, a series of lectures by five entrepreneurs (role model intervention), and an evaluation phase, to determine if the entrepreneurs influenced students' entrepreneurial intent. The lectures were given by entrepreneurs at different stages of their entrepreneurial journeys from fields such as construction, financial services, biomedical devices, and agricultural technology. This research makes a major contribution to knowledge by testing the motivation theory of role modelling (Morgenroth et al., 2015) in an entrepreneurship context. The findings offer new insights into our understanding of the mechanisms involved in role model entrepreneurial motivation, indicating that role model interventions can influence entrepreneurial intent by increasing expectancy of success and the rewards of entrepreneurial success. The study is unique as it uses role model interventions to motivate students while other studies investigate role models already present in a students' network without introducing new role models. This research contributes to practice by presenting a practical framework for guiding the role model intervention process and a questionnaire to measure the effectiveness of those interventions. This research can be useful for those involved in motivating individuals to consider entrepreneurship, those involved in career guidance and development, and those developing policies to promote entrepreneurship.

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## List of abbreviations

ACE	Accelerating Campus Entrepreneurship
BRIC	Brazil, Russia, India, and China
CEO	Chief Executive Officer
CIT	Cork Institute of Technology
DBA	Doctorate in Business Administration
FDA	US Food and Drug Administration
GEM	Global Entrepreneurship Monitor
GUESSS	Global University Entrepreneurial Spirit Students' Survey
HEI	Higher Education Institute
HPSU	High Potential Start-up
IEIS	Individual Entrepreneurial Intent Scale
IMDA	Irish Medical Device Association
IPD	Innovative Product Development
MMAR	Mixed-methods Action Research
QDA	Qualitative Data Analysis
SJR	Scimago Journal & Country Rank
STEM	Science, Technology, Engineering, & Maths
TEA	Total early-stage entrepreneurial activity
VIF	Variance Inflation Factor
WIT	Waterford Institute of Technology



**Section 1:**  
**Introduction and**  
**DBA research**  
**overview**

## 1. Introduction

Entrepreneurship plays a key role in promoting economic growth (Audretsch, 2004; Bourne, 2011; Méndez-Picazo et al., 2012). This has resulted in an increased focus on entrepreneurship and enterprise creation. By motivating more people to consider entrepreneurship, new businesses are created, generating employment, and creating wealth for the local economy (Henry et al., 2003). The Global Entrepreneurship Monitor (GEM) Survey of Entrepreneurship in Ireland has repeatedly argued that Ireland needs more entrepreneurs (O'Gorman & Fitzsimons, 2007). According to the GEM 2016 Ireland survey, the total early-stage entrepreneurial activity (TEA) in Ireland in 2017 was 10.9%, up from 8.9% in 2007. To put this in context, the highest-ranking EU country in 2017 was Estonia at 16.2%. The need for more entrepreneurs was further reinforced with the National Policy Statement on Entrepreneurship in Ireland 2014, setting a goal to increase start-ups by 25%. According to the GEM 2016 Ireland survey, the two age groups identified as having the lowest rate of entrepreneurship were those aged between 18 and 24 (9% involved in entrepreneurship) and those aged between 55 and 64 (10% involved in entrepreneurship). As the researcher was actively involved in working with the younger age group, this group was identified as the sample population for this study. The 2016 Global University Entrepreneurial Spirit Students' Survey (GUESSS) of Ireland found that 27.5% of students intended to start a business five years after graduation compared to 38.2% globally showing further potential in this age group. Sixty-six percent of these students surveyed indicated that they had attended lectures by guest speakers, i.e. potential role models during their studies.

Role modelling can change people's motivation to consider carrying out a particular task (Morgenroth et al., 2015). Can role models be used to motivate students to consider entrepreneurship as a career, i.e. to increase their entrepreneurial intent? The role model concept has been used as a method of motivation in many areas including sport, education, career development, and medicine. Literature aimed at establishing the importance of role models in influencing the entrepreneurial intent of students is scarce (Bosma et al., 2012; Zellweger et al., 2011) and no evidence exists of deliberately using role models as a method to motivate students to consider entrepreneurship.

This study is positioned in the field of entrepreneurship motivation and intentions. This research contributes to entrepreneurship theory and practice by testing an expectancy-value

theory of role model motivation and outlining a practical framework to offer guidance on how to use role models most effectively to influence entrepreneurial intent. Although this study took place in an educational setting, it is not involved in looking at entrepreneurship education but can offer educators guidance when developing policies to promote entrepreneurship. The framework can also assist when offering career guidance to students as they will have the opportunity to see what a career in entrepreneurship would involve through the experience of the role models.

This section of the thesis gives an introduction and research overview of the DBA and provides the reader with a broad scope of what lies ahead in the thesis. An overview of the research is provided and the academic, professional, and personal rationale for the study is explored. The theoretical underpinnings of the study and the research objectives are discussed. An overview of the research design is then given, followed by contributions to knowledge and practice. Finally, the structure of the thesis is outlined.

## **2. Research overview and academic rationale**

“Research aimed at establishing the importance of role models for (nascent) entrepreneurs is scarce” (Bosma et al., 2012, p.410). In addition to literature looking at the effect that role models have on the entrepreneurial intent of students, Bosma et al. (2012) identify three streams of literature relating to the influence of role models on entrepreneurs. The first and the most common stream relates to the influence of family role models. These studies found a strong positive correlation between starting a business and having parents who are or were entrepreneurs (Chlosta et al., 2012; Hoffmann et al., 2015; Parker, 2009). Two out of five entrepreneurial role models arise from strong links of family members and friends (Chlosta et al., 2012). This strong correlation is attributed to having familial role models but also arises from the opportunity to “learn on the job” while working in the family business and having access to resources such as know-how and financial supports (Barach & Ganitsky, 1995; Dyer & Handler, 1994).

The second stream relates to how networks and peer groups provide role models that influence the decision to become an entrepreneur. The entrepreneurial network approach assumes that one’s decision to become an entrepreneur is influenced by the people they interact with within their network (Kim & Aldrich, 2005; Klyver & Hindle, 2007). This stream of literature also

examines how an individual's entrepreneurial identity is shaped by role models in their peer group and how individuals learn about running a business by observing their peers (Falck et al., 2012; Giannetti & Simonov, 2009). The third stream of literature investigates the consistent and unequal spread of entrepreneurship across regions (Keeble et al., 1990; Kibler, 2013; Reynolds et al., 2007) and attributes the difference to the availability of role models in regions with greater levels of entrepreneurship (Lafuente et al., 2007; Vaillant et al., 2005). This stream also investigates the idea that entrepreneurship is "self-reinforcing" (Minniti, 2005, p.24), i.e. that areas with high levels of entrepreneurial activity will have more available role models, which in turn will initiate further entrepreneurial activity.

Initial studies investigating the effect that role models had on the entrepreneurial intent of students (Krueger et al., 2000; Rahman & Day, 2012; Scherer et al., 1989; Van Auken et al., 2006a; Zellweger et al., 2011) suggest a link between the presence of role models and students' intention to become an entrepreneur without directly establishing how or why role models influence students' intent to start a business (Bosma et al., 2012). According to Van Auken et al. (2006b, p.157), "studies cite the importance of role models for potential entrepreneurs but ignore how the role model process actually works". All studies investigate the role models already within one's network, both family and non-family, and influential or iconic role models outside of one's network, for example role models such as Steve Jobs or Bill Gates. No studies were identified that deliberately introduced role models to students (role model interventions) in order to influence entrepreneurial intent.

Moreover, many studies fail to investigate the match between the role model and the role aspirant (Bosma et al., 2012). Do entrepreneurs prefer role models that are similar to themselves in terms of personal characteristics, or do they prefer role models that they perceive as different (Morgenroth et al., 2015)? Are female entrepreneurs influenced differently by role model gender matching or mismatching? Lockwood (2006) concluded from her study on career role model gender matching and mismatching, that female role aspirants are inspired by female role models and this is even more pronounced when females are in a minority. In order to maximise the effectiveness of the role model intervention, the similarities and differences between the role model and role aspirant must be considered (Kim & Aldrich, 2005; Morgenroth et al., 2015). Several studies call for further research into "how" and "why" role models influence entrepreneurial intent with a particular focus on the effectiveness of the

interaction by investigating the characteristics of the role model and the role aspirant (Bosma et al., 2012; Morgenroth et al., 2015; Van Auken et al., 2006a; Zellweger et al., 2011).

### **3. Personal and professional rationale**

One of the main aims when choosing a research topic was to choose a topic that the researcher would derive intrinsic value from and that would complement his daily work activities. The researcher, a lecturer in Biomedical and Mechanical Engineering, is actively involved in delivering the module “Innovative Product Development”. The module involves facilitating idea generation workshops where students must come up with innovative ideas for a product. Students then design the product, commercialise the product, build a prototype, and test the prototype. On completion, students enter innovation and entrepreneurial competitions and have had great success winning both national and international competitions, including; National Finals of the Enterprise Ireland Student Entrepreneur Awards, Accenture Leaders of Tomorrow National Award, James Dyson Ireland Award, European Laureate of Innovation First Place Award, One University Start-up World Cup Finals Global Health Tech Leadership Award. The researcher has seen many innovative, life-changing, and potentially lifesaving products developed by students, but very few of these ideas have been taken to the next stage, i.e. a business start-up. The issue has become further exacerbated with an upturn in the economy and an increase in traditional employment opportunities. Multinationals are competing for students for graduate programmes and the recruitment process is taking place earlier in the students’ educational journey. A recurring feature of the feedback received from recruiting companies is the huge benefit they are seeing from the students having completed this Innovative Product Development module. The researcher believes that more students should consider entrepreneurship as a career. If students can see that entrepreneurial success is achievable and they value the rewards of that success, then they will be more motivated to consider entrepreneurship after graduation or at some point in the future.

Any research study should contribute to the professional development of the researcher and professionals have increasingly undertaken doctoral studies in order to enhance their own professional learning (Lee, 2011). This has been one of the main justifications for the researcher to commence this doctoral study. Publishing papers is an important career progression criterion for academics. Coming from an engineering background, the researcher’s previous research experience has been engineering focused. The researcher felt the need to

expand his research skills into non-engineering focused areas of study. As the researcher was actively involved in initiatives to motivate students to consider entrepreneurship, it was important to be able to publish papers in this area so that insights can be shared in the appropriate forum and to inform peers of the ongoing work in this area.

#### **4. Theoretical underpinnings**

The ‘Conceptual Paper’ (Paper 1) presents a review of motivational theories to determine the most appropriate foundation theory for this study. Theories focused on expectancy including self-efficacy theory (Bandura, 1997) and control theories (Crandall et al., 1965; Rotter, 1966) were compared with theories integrating expectancy and value constraints such as attribution theory (Weiner, 1992), self-worth theory (Covington, 1992, 1998) and modern day expectancy-value theory (Eccles et al., 1983; Meece et al., 1990). Expectancy-value theory was chosen as it encompassed many of the aspects of the other theories, including self-efficacy, and self-worth, and would allow a deeper analysis into the components of the motivation. These theories propose that the two principal factors influencing motivation are the expectations of success and how the perceived rewards of that success are valued. Expectancies for success relate to how well individuals believe they will do when completing a task, immediately, or at some point in the future (Eccles et al., 1983). Values refer to an individual’s perceived desirability of the outcomes of that success (Eccles et al., 1983).

Morgenroth et al. (2015) proposed an extension of the expectancy-value theoretical framework, the motivational theory of role modelling. The motivational theory of role modelling highlights how the influence of role models can be used to increase role aspirants’ motivation.

Morgenroth et al. (2015) offer four propositions which will be used in guiding the development of propositions for this research study:

1. Perceived goal embodiment influences expectancy, and in turn motivation and goals, by prompting vicarious learning.
2. Perceived goal embodiment and perceived attainability interact to influence expectancy, and in turn motivation and goals, by changing self-stereotyping.
3. Perceived goal embodiment and perceived attainability interact to influence expectancy, and in turn motivation and goals, by changing perceived external barriers.

4. Perceived desirability influences value, and in turn motivation and the adoption of new goals by promoting the related processes of personal identification, internalisation, and admiration.

The increasing acknowledgement of Morgenroth et al.'s (2015) research can be seen by frequent citations in recent studies. The theory has been examined in relation to a lack of female gamers due to a lack of female role models (Paaßen et al., 2017), teachers influence on active engagement of students and their intentions (Moran, 2016), and how successful and ageing role models can change individuals' perceptions on ageing (Jopp et al., 2016). No evidence was found in the literature of using the theory to investigate the influence of role models on entrepreneurial intent. Morgenroth et al. (2015) echo the calls of other researchers, calling for studies on the direct impact that role models have on expectancy and values and how that influences motivation. Furthermore, according to Eccles and Wigfield (2002, p.122), "more work is needed on how the links of expectancies and values to performance and choice change across ages and on the links between expectancies and values." It is proposed that this research study will further explore the motivation theory of role modelling. Based on the expectancy-value theory of motivation, individuals will be more motivated to take up entrepreneurship if they believe they have the proficiencies to do so, if they expect success, if they sense that they have control over their own success, and finally if they value the rewards of that success. Role models may help to improve these perceptions, and this will form the main element of this study.

## **5. Research objectives**

Role modelling can change people's willingness to undertake a certain task (Morgenroth et al., 2015). Therefore, the question is - can role models be used to increase entrepreneurial intent and can we develop a framework to show how role model interventions can be used to maximise their influence as motivators? Based on this thinking, the objectives for this research are:

1. To investigate how role models can be used to motivate students to consider entrepreneurship as a career.
2. To understand how role model interventions can be most effective in motivating students to consider entrepreneurship as a career.

3. To develop a framework for the use of role modelling intervention for the promotion of entrepreneurship as a career.

These research objectives position this study in the field of entrepreneurship motivation and intentions. The first two objectives relate to entrepreneurship theory. What are the mechanisms involved in role models motivating students to consider entrepreneurship? Many studies fail to explore the comparisons and differences of the role model and the role aspirant (Bosma et al., 2012). How can a better knowledge of these similarities and differences contribute to maximising the effectiveness of the intervention? Finally, the third objective will contribute to entrepreneurship practice. How can the insights from this study be used to inform the future role model interventions most effectively to motivate individuals to consider entrepreneurship?

## **6. Research design**

The conceptualisation of the research is provided in the ‘Conceptual Paper’ (Paper 1). Justification for the research methodology is presented in the ‘Methodology’ (Paper 2) and the ‘Design & Initial Findings’ (Paper 3). The ‘Findings & Discussion’ Paper (Paper 4) presents the initial findings from the mixed-methods design. This section summarises the research design for this study.

### **6.1 Conceptualising the research**

Repeating themes from the literature review were categorised to develop the concepts and propositions of this research (‘Conceptual Paper’, Paper 1). By seeing what is achievable, it is proposed that students’ perceived attainability of entrepreneurial success will increase. Through admiration and internalisation of role model qualities, it is proposed that students’ desirability of entrepreneurial success will increase. In turn, students’ entrepreneurial intent will increase.

Empirical studies loosely suggest a positive influence of role models on the decision to become an entrepreneur, but a link between role model influence and entrepreneurial intent is inconclusive, leading to the research question:



*Can role models increase students' entrepreneurial intent by increasing their expectancy of entrepreneurial success and/or by highlighting the rewards of entrepreneurial success?*

Aspects of the theories were used to develop the conceptual framework and to develop the propositions for this study. Following on from the review of the literature and linking future research to the motivation theory of role modelling, the following propositions were offered (see 'Conceptual Paper', Paper 1);

P<sub>1</sub>: Role models positively influence the role aspirant's perception of their own entrepreneurial competencies.

P<sub>2</sub>: Role models positively influence the role aspirant's expectation of success.

P<sub>3</sub>: Role models positively influence the role aspirant's perception of control over their own success.

P<sub>4</sub>: Role models positively influence the role aspirant's desirability of entrepreneurial success by outlining the rewards and the value of that success.

Proposition P<sub>1</sub> relates to expectancy based on internal factors, i.e. how one's perceived likelihood of success is based on their own perceived abilities and traits. It is closely related to self-efficacy and is often linked with motivation expectancy theories (Bandura, 1997; Morgenroth et al., 2015). Evidence from the literature suggests that role models can influence an individual's perception of their own entrepreneurial competencies (Bosma et al., 2012; Laviolette et al., 2012; Markowska, 2011; McCullough, 2013; Nandamuri, 2015). One means of role models influencing self-efficacy is through vicarious learning, i.e. by observing the role model successfully complete a task, an individual will have an increased confidence that they will be able to complete the task themselves (Hoyt, 2013; Law & Hall, 2009).

Proposition P<sub>2</sub> relates to how role models can influence individuals' general expectancy of success by "representing the possible" (Morgenroth et al., 2015, p.8). This differs from vicarious learning in that role models are not showing how to become a successful entrepreneur, but showing that success is possible. When observing that the role model has become a successful entrepreneur, and students can relate to that role model, they can imagine themselves in the position of the role model, i.e. success is attainable (Brown et al., 1992; Collins, 1996; Lockwood, 2006).

Proposition P<sub>3</sub> is based on an individual's perception of control over external factors. An individual may believe that they have the entrepreneurial skills and traits to achieve success, but that other external factors might make success less likely. Role models can change perceived barriers such as financial barriers (Robertson et al., 2003; Sandhu et al., 2011), barriers due to fear of failure (Wyrwich et al., 2016), or perceived gender barriers to entrepreneurship due to lower numbers of female entrepreneurs (Austin & Nauta, 2016; Buttner, 1993).

Finally, proposition P<sub>4</sub> relates to role models changing the desirability of entrepreneurship by highlighting the rewards of success and how those rewards are valued. Value is a key component of expectancy-value theories of motivation (Eccles & Wigfield, 2002; Morgenroth et al., 2015). Evidence in the literature has found that role models can influence how individuals value the rewards of entrepreneurship (Hisrich, 1990; Van Auken et al., 2006a; Wyrwich et al., 2016). Rewards can be both extrinsic and intrinsic. Role models make known rewards more valuable but can also educate role aspirants about new rewards they had not considered (Morgenroth et al., 2015).

## **6.2 Mixed-methods design**

As the researcher is coming from an engineering background, it is important at this stage to outline his positivist philosophical position. It is also important to note that the methodology chosen should best suit the research and not the researcher. Both experimentation and action research methodologies were considered. Experimentation was ruled out for ethical reasons as one group of students, the experimental group, would have the opportunity to attend the entrepreneurship lectures, while the other group would not. Action research was ruled out due to the timescale of the DBA, which did not allow for the iterative process that is involved in action research.

Based on the philosophical position of the researcher and considering the advantages and disadvantages of different approaches, it was concluded that the methodology that best suited the research problem is a mixed-methods design. As part of the research design, the entrepreneurial intent of the students would be measured before and after the role model intervention. The change in entrepreneurial intent is quantifiable, but this does not give the whole picture. By adding a qualitative element to the study, it is possible to investigate "why" there is a change in intent if a change is observed. A mixed-methods design allows the

researcher to investigate deeper into the findings. Triangulation is the most commonly used mixed-methods design (Creswell et al., 2003). The goal of triangulation mixed-methods design is to “obtain different but complementary data on the same topic” (Morse, 1991, p. 122). This allows the researcher to determine if the findings from the qualitative and quantitative data convergence, strengthening the findings of the research study or to investigate the reasons for a lack of convergence.

### **6.3 Design overview**

Before starting the study, both the supervising institute, Waterford Institute of Technology (WIT), and the host institute, Cork Institute of Technology (CIT), approved the research procedure. The unit of observation for this research study is students’ entrepreneurial perceptions. The sample population selected for this research was students currently in the fourth year of a four-year Honours degree or a five-year Masters degree in Mechanical Engineering and Biomedical Engineering. As part of the research methods, every student in the sample population was asked to complete a written consent form prior to taking part in the study. All students were anonymised, but a unique identifier enabled the researcher to compare data for each individual student at different stages of the study. This allowed for a further level of investigation and analysis. Students had to attend the entrepreneurship lectures as part of their core module “Engineering Management” but participation in the study was entirely voluntary. All 82 fourth-year Biomedical and Mechanical Engineering students (male = 73, Female = 9) with an average age of 22.7 years (SD =3.3) consented to participate in the study.

The mixed-methods research design incorporated 4 phases; conceptualising the research, an initial investigation, an intervention i.e. the entrepreneurship lecture series, and an evaluation of results phase. Figure 1 outlines the timeline of the study and Figure 2 presents a graphical representation of the 4-phase mixed-methods design. Phase 1, conceptualising the research, is discussed in the ‘Conceptual Paper’, paper 1, of the research series. As part of the research design, a pilot study was conducted to test the data collection instruments. A total of 95 respondents completed the investigation stage pilot questionnaire and 35 respondents completed the evaluation stage pilot questionnaire. Based on the outcome of the pilot study, the data collection instruments were modified and finalised. Data was collected over the first

semester of academic year 2019/2020. A semester consists of 12 weeks and collecting the data over a limited period reduced the impact of extraneous variables.

A quantitative and qualitative investigation survey was developed and distributed using Survey Monkey (phase 2). Entrepreneurs were recruited with the assistance of the ACE group in CIT. The entrepreneurship lectures were approximately one hour in duration, and students were asked to attend a minimum of four out of the five lectures (phase 3). A question and answers session concluded each lecture. A quantitative evaluation survey was developed and distributed using Survey Monkey. Students were also asked to complete a reflection of approximately 1,000 words on their learning and observations from the entrepreneurship lectures (phase 4). The data was then analysed using SPSS for the quantitative data and Nvivo for the qualitative data.

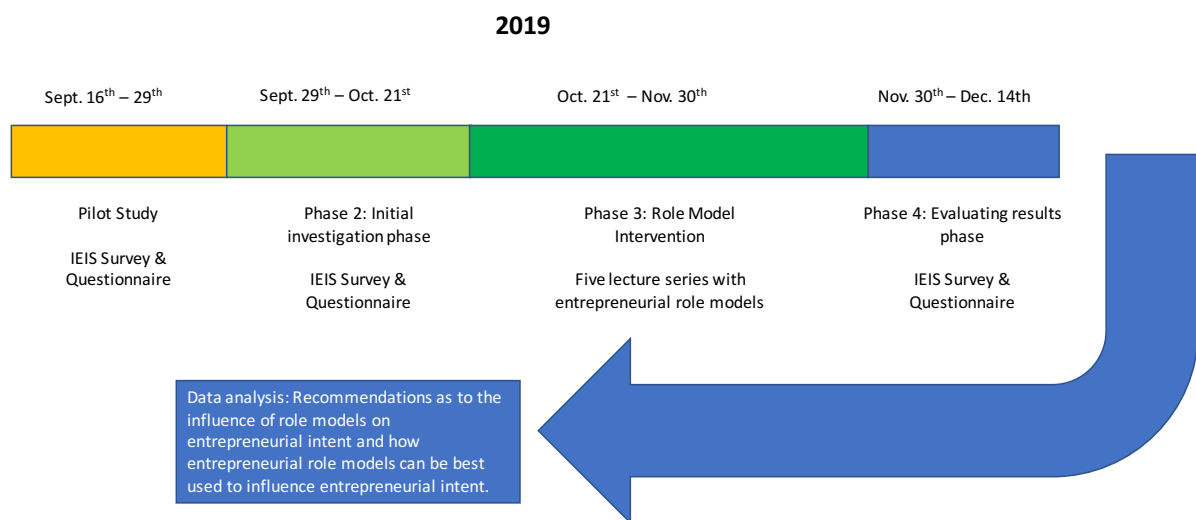


Figure 1: Research timeline of the data collection, semester 1, 2019 (source: current research)

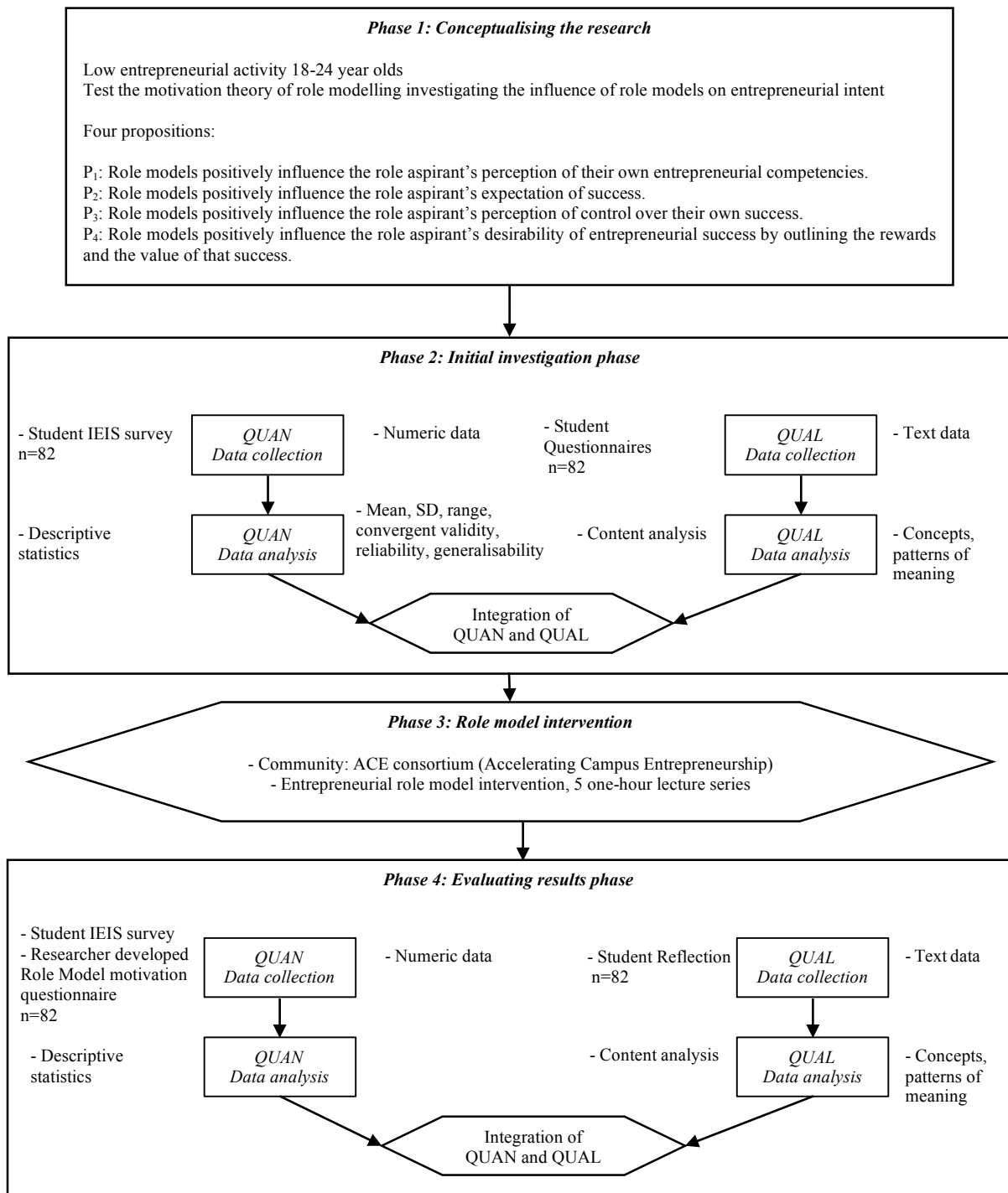


Figure 2: 4 phase mixed-methods design (source: current research)

## 7. Contributions

An important aim of the DBA process is for participants to make a valid contribution to the advancement of knowledge and practice of management in their profession. This research is located in the field of entrepreneurship motivation and intentions and aims to contribute to our understanding of how role models can be used to motivate students to consider entrepreneurship and to address calls for research in this area (Bosma et al., 2012; Morgenroth et al., 2015; Van Auken et al., 2006a; Zellweger et al., 2011). The underlying theory of this study, the motivational theory of role modelling (Morgenroth et al., 2015) is tested offering a major contribution to this field of study. Some studies have examined the influence of role models on entrepreneurial intent and other studies have examined the Morgenroth et al. (2015) theory in other domains, but no overlap was identified of using the theory to examine role model influence on entrepreneurial intent of students. Moreover, this study differs from other studies in this area as it deliberately uses role model interventions to influence entrepreneurial intent, whereas other studies investigate role models already in an individual's network. This research also addresses another common failing identified by Bosma et al. (2012), that is the lack of understanding as to how role model and role aspirant's traits interact to maximise the effect of role model influence.

Contribution to practice allows sponsoring organisations to benefit from a substantial body of work through the DBA thesis. The low numbers of students considering entrepreneurship as a career was seen in the researcher's own Higher Education Institute (HEI) organisation and an opportunity to contribute to practice was identified. An objective of this study was to develop a framework that could be used to guide the process of role model entrepreneurship motivation. The framework will benefit those looking at motivating individuals to consider entrepreneurship. Another output of this study is the "Role model entrepreneurial motivation questionnaire". The questionnaire can be used to measure the effectiveness of role model interventions. Findings from this study can also be of benefit to those involved in career guidance and development. Role models can be used to motivate individuals to consider entrepreneurship as a career, or any other profession as a career. They can also assist potential entrepreneurs with gaining the knowledge required to set up a business at an early stage. Role models can also highlight the value and rewards of becoming a successful entrepreneur. Finally, insights from this research can assist those developing policies to promote entrepreneurship by using role models to highlight the rewards of entrepreneurship, to show

how to overcome barriers to entrepreneurship, and to deliver training and mentoring to potential entrepreneurs.

## **8. Structure of the thesis**

This thesis is structured into four sections which were developed throughout the DBA. The timeline of thesis development is shown in Figure 3. This section, section 1, provides an introduction and research overview of the DBA. Section 2, the research paper series, consists of the four papers; ‘Conceptual Paper’ (Paper 1), ‘Methodology’ (Paper 2), ‘Design & Initial Findings’ (Paper 3), and ‘Findings & Discussion’ (Paper 4). Each of these papers was prepared and examined at points in time throughout the DBA journey, and each paper is preceded with a paper preface. As the thesis has been developed from various papers produced at different points, the prefaces offer a linking narrative and context and attempt to provide cohesiveness to the overall thesis.

The ‘Conceptual Paper’ (Paper 1) presents a preview of the literature and provides the theoretical foundation for the aims and objectives of the study. The review provides the most up-to-date research in the field of role models and their application in the area of entrepreneurial research. The theoretical underpinning of this research, the motivational theory of role modelling (Morgenroth et al., 2015), is introduced. The ‘Methodology’ Paper (Paper 2) presents the positivist philosophical positioning of the study and justifies a mixed-methods design. The ‘Design & Initial Findings’ (Paper 3) presents the findings of the pre-testing of the data collection instruments. An analysis of the pilot study data is given and corresponding changes to the main study are proposed. The ‘Findings & Discussion’ Paper (Paper 4) presents the initial findings from the mixed-methods design. The findings of the qualitative data analysis (QDA) utilising thematic analysis (Braun & Clarke, 2006), the findings of the quantitative data analysis, and the convergence of the findings are presented.

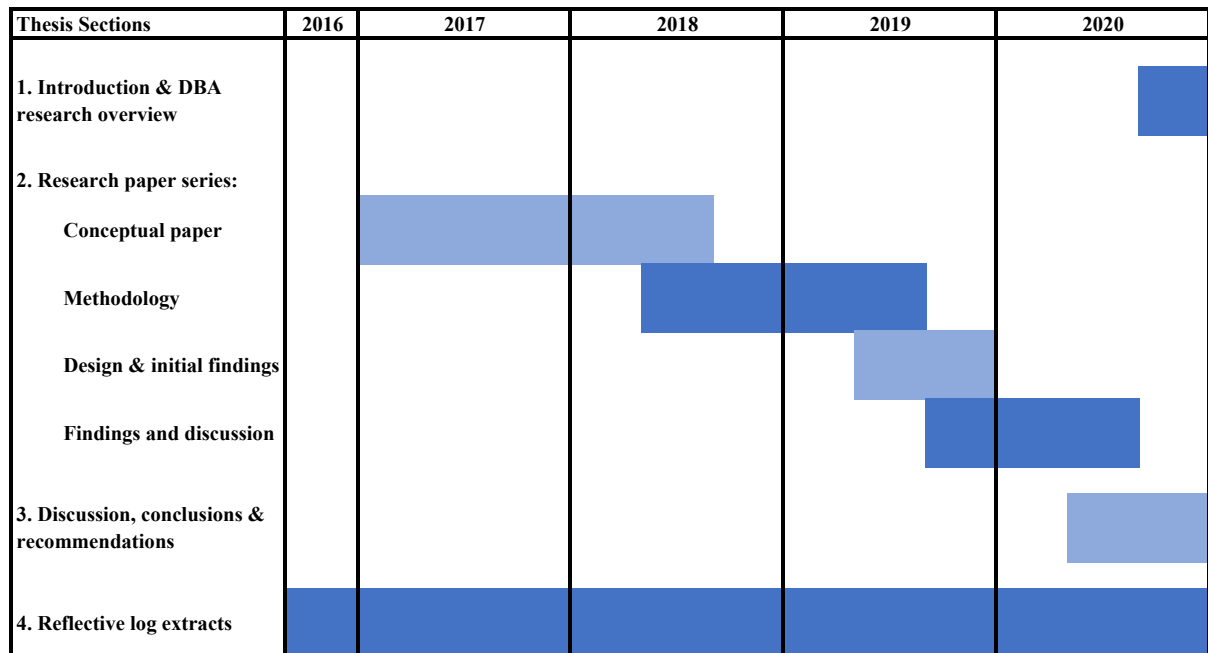


Figure 3: Timeline of thesis development (source: current research)

Section 3 provides a discussion in relation to the findings identified in Paper 4 “Findings and Discussion”. This is followed with a presentation of a proposed framework which helps inform how role modelling intervention can be used to promote entrepreneurship as a career for students. A summary of the findings, limitations of this research study, and opportunities for further research are provided.

Section 4 outlines the reflective log extracts. This section is compiled from extracts from the researcher’s reflective log that has been maintained over the DBA programme. The logs were commenced during the Professional Development workshop and concluded at the end of the DBA process. The log captures the researcher’s development throughout the DBA, culminating with an overall reflection concluding the DBA process.



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# **Section 2:**

# **Cumulative**

# **Paper Series**



## **Preface to paper 1 – Conceptual Paper**

The ‘Conceptual Paper’ (Paper 1) was presented at the Doctoral Colloquium held in WIT in April 2018. The final version of the paper included in this thesis was submitted following amendments based upon examiner commentary. At this point in the study, the researcher found that his research skills were still in development. It was easy to become overwhelmed by the large body of literature in the area of entrepreneurship. A strategy was developed where the researcher ranked journals using the Scimago Journal & Country Rank (SJR) and then looked for the most cited articles in those top-ranking journals. Another area of development was academic writing. Through attending workshops, practice, supervisor feedback, and examiner feedback, this skill developed throughout the course of the DBA.

An important skill acquired was the ability to reflect. Maintaining a reflective log was initially seen as a requirement of the DBA process, but quickly became a valuable tool that aided the researcher and acted as a source of encouragement during the learning journey. Early reflections focused on the personal and professional rationale in choosing a research topic. The researcher wanted to find an area that they could derive some intrinsic value from and that would also aid in his own professional development. The researcher saw first-hand the great innovative talent of students, but also had a sense of frustration that none of these students considered entrepreneurship as a potential career.

Originally, the idea was to persuade more students to become entrepreneurs. It became evident very quickly that if the success of the DBA was to depend on more students choosing entrepreneurship, then the process was destined to fail. Instead, as guided by the supervisors, a suitable construct was required. This construct was entrepreneurial intent. The focus was now to influence students’ entrepreneurial intent so that they would consider entrepreneurship after graduation, or at some point in the future. Following a review of different entrepreneurial intent scales (summarised in Paper 1, Section 6.1, Table 5), Thompson’s (2009) Individual Entrepreneurial Intent Scale (IEIS) was chosen due to its common use in entrepreneurship literature, and its high validity and reliability. Students’ entrepreneurial intent would be measured using Thompson’s (2009) IEIS before and after the role model intervention. The scale includes ten items that are a mix of direct measures of intention and measures of behaviours that strongly infer intentions. The scale has no measures of beliefs or attitudes towards entrepreneurship and according to Valliere (2015) this offers an advantage as omitting

these measures simplifies the operationalisation. But this simplification may also be a disadvantage of Thompson's (2009) IEIS. Other modern intent scales use measures of attitudes, behaviours, or expectations, or a combination of all three. On reflection, as this research investigates expectations and attitudes towards entrepreneurship, another intent scale may have offered deeper insight and allowed a deeper analysis on the convergence of the quantitative and qualitative data. This is discussed in more detail in Paper 4 "Findings and Discussion" and in the discussion section of this thesis.

The researcher then reflected on how entrepreneurial intent could be influenced. A review of the literature found evidence of entrepreneurship education influencing intent (Bae et al., 2014; Liñán et al., 2011; Maresch et al., 2016; Zhang et al., 2014) and role models influencing intent (Krueger et al., 2000; Morgenroth et al., 2015; Scherer et al., 1989; Van Auken et al., 2006; Zellweger et al., 2011). However, no evidence of deliberately using role model interventions to influence student intent was discovered; that is to say, prior research demonstrating choosing role models to talk to students about entrepreneurship so as to influence students' entrepreneurial intent was not identified. Also, numerous studies called for more research into the process of how role models can influence entrepreneurial intent (Bosma et al., 2012; Morgenroth et al., 2015; Van Auken et al., 2006; Zellweger et al., 2011). It was therefore decided to focus on role model interventions, as this had the greatest potential for new and unique research opportunities.

As Paper 1 was started in 2017, it is prudent to present new and relevant literature relating to this topic. For example, three recent and relevant studies were identified, demonstrating the increasing interest in this field. Nowinski et al. (2019) surveyed 423 students across five Polish HEIs to investigate drivers of entrepreneurial intent. Students were asked if family entrepreneurial role models, guest entrepreneurial speakers at their university, or personal encounters with successful entrepreneurs had made them "seriously consider embarking on an entrepreneurial career" (p.186). Role models, entrepreneurial attitudes, and entrepreneurial self-efficacies were identified as the three most effective variables influencing entrepreneurial intent. Nowinski et al. (2019) concluded that for role models to influence entrepreneurial intent, both positive attitudes towards entrepreneurship and entrepreneurship self-efficacy must exist. Nowinski et al. recommend that individuals be exposed to successful entrepreneurs or guest speakers to show that entrepreneurship is "feasible" (expectancy) and "worth doing" (value) further reinforcing the justification for this study (p.190).

Fellnhofer and Mueller (2018) also reinforced calls for research in this area, stating that the process through which role models influence entrepreneurial intent has not yet been investigated comprehensively. They surveyed 266 students from Austria, Finland, and Greece to examine how do role models affect entrepreneurial intention and concluded that role models increase entrepreneurial intent by changing both the perceived desirability and feasibility of entrepreneurship. Finally, Garaika et al. (2019) surveyed 200 entrepreneurs, aged between 20 and 30, and who had started their own businesses. Garaika et al. (2019) investigated the influence of education, role models, self-efficacy, self-personality, and self-confidence on entrepreneurial intention and concluded that education and role models influence self-efficacy and that self-efficacy, self-personality and self-confidence influence entrepreneurial intention. Interestingly, the study cites Morgenroth (2015) to identify role models as individuals who offer an example of success that is attainable, and provides a template for the behaviours required to be successful. The study does not reference or test the “motivational theory of role modelling” (Morgenroth et al., 2015) further highlighting a gap in this field of study. All three research studies, like most studies in this area, explore the consequential effect that role models in an individual’s network have on entrepreneurial intent. However, no attempt was made in these research studies, to deliberately use role model interventions to influence entrepreneurial intent.

According to Fellnhofer and Mueller (2018), females showed significantly lower levels of perceived desirability and feasibility of entrepreneurship than males. A common conclusion in this field of study is the requirement to consider the role that gender plays in entrepreneurial intention (Crant, 1996; Fellnhofer & Mueller, 2018; Lockwood, 2006; Minniti & Nardone, 2007; Wilson et al., 2009). Nine of the eighty-two participating students in the current study were female and although it was not statistically possible to make inferences to the part that gender plays in role models influencing entrepreneurial intent, initial observations are noted in the discussion section of this thesis. These initial observations may guide future studies with a higher percentage of participating females.

It is also useful at this stage to update the Irish entrepreneurial environment. The latest Global Entrepreneurship Monitor (GEM) Survey of Entrepreneurship in Ireland report at the time this study commenced was the GEM 2016 report. According to the 2016 report, entrepreneurial activity in Ireland was at its lowest amongst those aged between 18 and 24 (9% rate of

entrepreneurship within the age group). This became one of the main justifications for the study. The percentage total of early-stage entrepreneurial activity (TEA) within the same age group decreased to 6.6% in 2017 and increased slightly to 6.8% in 2018. In 2019, a marked change could be noted. Over 14% of those aged between 18 and 25 were early stage entrepreneurs, but this still only accounted for 16% of all entrepreneurs. Table 1 gives a comparison of the stats taken from the 2016 and 2019 GEM reports. The Global University Entrepreneurial Spirit Students' Survey (GUESSS) of Ireland was also updated in 2019. The survey found that 33.95% of students intended to start a business five years after graduation, up from 27.5% in 2016. In comparison, 34.7% of students globally intended to start a business five years after graduation, down from 38.2% in 2016. The percentage of students that indicated that they had attended lectures by guest speakers, remained the same as in 2016, at 66%.

	TEA		Youth 18-24 (% rate within age group)	
	2016	2019	2016	2019
<b>Top Ranking EU</b>	16.2%	16.2%	25%	18.9%
	<i>Estonia</i>	<i>Latvia</i>	<i>Latvia</i>	<i>Latvia</i>
<b>Ireland</b>	10.9%	12.4%	9%	14.2%
<b>Low Ranking EU</b>	4.4%	2.8%	0.4%	1.9%
	<i>Italy</i>	<i>Italy</i>	<i>Slovakia</i>	<i>Italy</i>
<b>Australia</b>	14.6%	10.5%	9%	5.5%
<b>Canada</b>	16.7%	18.2%	15%	25.7%
<b>USA</b>	12.6%	17.4%	11%	15.8%

Table 1: Entrepreneurship stats comparison (Sourced from Ireland GEM survey 2016, 2019)

Following a discussion with the supervisors, the title of the research was changed. The title used in the paper series “A framework for the utilisation of role modelling intervention for the promotion of entrepreneurship as an alternative career path” was changed to “Role model interventions to motivate students to consider entrepreneurship as a career”. It was felt that this title better reflected the research objectives of the study. The ‘Conceptual Paper’ (Paper 1) will now follow, and this preface should give the reader more clarity as to how the paper sits in the overall thesis.

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**Paper 1:  
Conceptual  
Paper**

**Examination Date:  
28/04/2018**



Participant Name: Paul Keane 20077332

Supervisors: Dr. Cormac O' Keeffe and Prof. Bill O' Gorman

Date: 03/04/2018

**RESEARCH PAPER SERIES**

**Paper 1:**

**CONCEPTUAL PAPER**

**“A framework for the utilisation of role modelling intervention for the promotion of entrepreneurship as an alternative career path.”**

## **ABSTRACT**

As outlined by Audretsch (2004) entrepreneurial activity is a key driver of economic growth. The National Policy Statement on Entrepreneurship in Ireland 2014 indicates that two-thirds of all new jobs come from start-ups in the first five years of existence. This has led to an increased focus on entrepreneurship due to the potential for economic growth and job creation. Entrepreneurial activity is at its lowest amongst those aged between 18 and 24 (9%). Ireland has an abundance of successful entrepreneurs. To what extent can role models influence entrepreneurial intent?

The purpose of this paper is to examine a link between role model influence and entrepreneurial intent. A comprehensive literature review of research in the area of role modelling, entrepreneurship, and motivation theory of role modelling will be conducted in order to highlight gaps in the current research. These gaps will then be addressed as part of a larger research study. The literature review indicates that empirical research aimed at establishing the importance of role models influencing the entrepreneurial intent of potential entrepreneurs is scarce. Empirical studies loosely suggest a positive influence of role models on the decision to become an entrepreneur but a link between role model influence and entrepreneurial intent is inconclusive. According to Gibson (2004), varied historical research emphasises the importance of role models. However empirical research on this concept has declined and suggests that reassessment is required. Many studies fail to take into account the individual determinants of entrepreneurship such as personality traits of an entrepreneur.

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## **1. Introduction and plan of the paper**

The purpose of this paper is to examine a link between role model influence and entrepreneurial intent. Morgenroth et al. (2015, p. 4) define role models as “individuals who influence role aspirants’ achievements, motivation, and goals by acting as behavioural models, representations of the possible, and/or inspirations”. Thompson (2009, p. 676) defines entrepreneurial intent as “a self-acknowledged conviction by a person that they intend to set up a new business venture and consciously plan to do so at some point in the future”.

As outlined by Audretsch (2004) entrepreneurial activity is a key driver of economic growth. Countries with a higher occurrence of opportunity driven entrepreneurship tend to have a higher prevalence of high-job-growth (Hessels et al., 2008). The National Policy Statement on Entrepreneurship in Ireland 2014 indicates that two-thirds of all new jobs come from start-ups in the first five years of existence. This has led to an increased focus on entrepreneurship due to the potential for economic growth and job creation. The policy sets a goal to increase start-ups by 25%. Entrepreneurial activity in Ireland is at its lowest amongst those aged between 18 and 24, typically accounting for 9% of the entrepreneurial population, and is significantly lower than in other European countries. In comparison, entrepreneurial activity in Latvia for the same age bracket is approximately 25%. Ireland has an abundance of successful entrepreneurs. To what extent can role models influence entrepreneurial intent?

Section 2 investigates the status of the Irish entrepreneurial environment. Section 3 discusses the evolving meaning of the term entrepreneurship. Definitions of entrepreneurship are considered. The personality traits of entrepreneurs are reviewed, and the research in the area of entrepreneurial motivators is examined.

Section 4 discusses the definition of a role model and how the concept has been utilised in research since the term was first coined in the 1950s. Role models in the context of entrepreneurship research are analysed to determine the effect on entrepreneurial intent and to show that research so far has been inconclusive in this area.

Section 5 summarises the relevant theory of this study. Motivational theories focusing on expectancy-value theories were chosen as the most applicable as most entrepreneurship motivation research focuses on the personality traits associated with expectancy of success and the value of that success. According to Corley and Gioia (2011), papers that display both original, revelatory insight and scientific usefulness are most likely to be published in top academic journals. This research will aim to be both incremental and practical. An approach of theory testing rather than theory building will be taken. The theory of planned behaviour and its role on entrepreneurial intent is addressed. An extension of the expectancy-value theoretical framework, the motivational theory of role modelling, is examined and it is proposed that the testing of this theory will form the basis of further research.

Section 6 examines entrepreneurial intent and the correlation between intent and becoming an entrepreneur. The IEIS (Individual Entrepreneurial Intent Scale) is analysed to determine its validity and applicability as a measure of entrepreneurial intent. A conceptual framework is proposed and will form the foundation for further research. Concepts and propositions are defined. Section 7 summarises the arguments and considers the findings of this conceptual paper. The next stages of this research study are outlined.

## **2. The Irish entrepreneurial environment**

O'Gorman and Fitzsimons (2007) pose the question, does Ireland have enough entrepreneurs? They argue that Ireland needs more entrepreneurs and this will have an impact on economic development. The recent National Strategy for Higher Education to 2030 report suggests that higher education will be the “engine for new ideas through research, and many of these ideas will translate into the sustaining innovative enterprises of the future” (Higher Education Authority, 2011, p. 10). Fleming (1994) found that even though the role of the education system in influencing entrepreneurship was strong, the percentage of graduate start-ups was low. Relatively low entrepreneurial activity for those aged between 18 and 24 indicate that potential entrepreneurs are choosing an alternative career path. According to Low (2005), graduates will typically commence working for others before they leave to start their own entrepreneurial activity.

The Global Entrepreneurship Monitor (GEM) is a cross-country comparison of early-stage entrepreneurial activity. The project was initiated to identify the level of entrepreneurial activity within national economies and then to identify what aspects of the socio-economic, institutional environment might be associated with higher levels of entrepreneurial activity (O'Gorman & Fitzsimons, 2007).

Table 1 summarises the findings of the GEM 2016 Survey of Entrepreneurship in Ireland and compares the results to global GEM surveys. The total early-stage entrepreneurial activity (TEA) index is used as a measure of entrepreneurship. Ireland had relatively high rates of entrepreneurship in 2016 increasing from a low of 7% in 2008 to 10.9%. The report found that attitudes and perceptions of entrepreneurship in Ireland are the highest in Europe in terms of popular regard for successful entrepreneurs. An increase-wealth motive was found to be the strongest primary motivation cited by nascent entrepreneurs and new business owners in Ireland. Irish entrepreneurs are found to be predominately motivated by opportunity.

	TEA	Perceived Opportunities	Skills & Knowledge	Role models Known	Fear of Failure	Rate of youth (18-24)	Entrep. as a good career choice
<b>Top Ranking EU</b>	16.2% <i>Estonia</i>	78% <i>Sweden</i>	60% <i>Poland</i>	47% <i>Poland</i>	35% <i>Netherlands</i>	25% <i>Latvia</i>	78% <i>Netherlands</i>
<b>Ireland</b>	10.9%	45%	45%	31%	38%	9%	56%
<b>Low Ranking EU</b>	4.4% <i>Italy</i>	13% <i>Greece</i>	31% <i>Italy</i>	22% <i>Germany</i>	70% <i>Greece</i>	0.4% <i>Slovakia</i>	39% <i>Switzerland</i>
<b>Australia</b>	14.6%	49%	52%	35%	42%	9%	54%
<b>Canada</b>	16.7%	59%	54%	36%	44%	15%	65%
<b>USA</b>	12.6%	57%	55%	31%	35%	11%	64%

Table 1: Ireland entrepreneurship stats global comparison (Sourced from Ireland GEM survey, 2016)

### **3. Entrepreneurship**

#### **3.1 Defining entrepreneurship**

Entrepreneurship consists of two related processes, a discovery of entrepreneurial opportunities and exploitation (Shane & Venkataraman, 2000). To foster and encourage entrepreneurship through targeted policy initiatives, it is essential that policymakers have a clear understanding of what constitutes an entrepreneur and entrepreneurial activity (Kobia & Sikalieh, 2010). Early attempts to define entrepreneurship emerged from the theories of economic development. Schumpeter (1934, p. 68), labelled “the prophet of innovation”, defined entrepreneurship as “carrying out new combinations”. Knight’s (1921) definition focuses on the optimism of entrepreneurs in predicting their success. Kirzner and Israel (1973) state that entrepreneurship consists of the competitive behaviours that drive the market process. Leibenstein (1978) defined entrepreneurship as the ability to work smarter and harder than your competitor. Researchers have attempted to define entrepreneurship with varying success. The difficulty arises due to the complexity of connecting and intertwining constructs such as management of change, innovation, technological and environmental turbulence, new product development, small business management, individualism and industry evolution (Low & MacMillan, 1988).

According to Davidsson (2003), attempts to define entrepreneurship have focused on three distinct phenomena; using the skills that characterise the entrepreneur; using those processes and events which are part of entrepreneurship; and using those results that entrepreneurship leads to. Low and MacMillan (1988, p. 142) suggest a uniting definition of entrepreneurship as “the creation of the new enterprise”. Hindle and Rushworth (2000) describe entrepreneurship as an activity which leads to the formation and management of a new organisation intended to pursue a unique, innovative opportunity. These definitions imply that enterprise is an outcome of entrepreneurship. However, other definitions oppose this idea and propose that entrepreneurship is essentially, about using enterprise to create new business. Coulter (2001) defines entrepreneurship as the process of utilising organised efforts and means to pursue opportunities to create value and develop by fulfilling wants and needs through innovation and uniqueness, no matter what resources are currently controlled.

The act of being an entrepreneur is the capability to produce and build a vision from practically nothing (Timmons et al., 1994), thus, being enterprising. It is generally accepted that “entrepreneurs serve as agents of change; provide creative, innovative ideas for business enterprises; and help businesses grow and become profitable” (Kobia & Sikalieh, 2010, p. 112).

### **3.2 Personality traits as predictors of entrepreneurship**

Personality traits play an important role as predictors of entrepreneurship. Achievement motivation, locus of control, risk propensity, innovativeness, and proactivity, or proactive personality are all common personality traits evident from past research (Brandstätter, 2011; Fairlie & Holleran, 2012; Leutner et al., 2014; Verheul et al., 2012; Yan, 2010). In general, these traits are considered positive. Negative personality traits such as overconfidence, narcissism, and impulsivity can also be predictors of entrepreneurship (Klotz & Neubaum, 2016; Navis & Ozbek, 2017; Wiklund et al., 2017).

*Achievement motivation* can be defined as the desire to achieve via one’s abilities and efforts to experience the enhanced self-esteem from the achievement (Miner, 1993). McClelland (1961) was the first to suggest that a high need for achievement, characterised by a desire to do well to attain a feeling of accomplishment, predisposes an individual to seek out an entrepreneurial position, which the entrepreneur believes produces more achievement satisfaction than could be derived from other kinds of positions. Also, McClelland’s study (1961) showed that people with high achievement motivation tend to have a greater perception of their probability of success. Atkinson (1957) found that people with high achievement motivation tend to believe that they have a greater chance of success than the stated odds. According to Shaver and Scott (1992), achievement motivation is perhaps the most widely cited personality characteristic of entrepreneurs.

*Locus of control* refers to a generalised belief that a person can or cannot control his or her own destiny (Rotter, 1966). Two forms of locus of control are prominent in literature, i.e., internal and external locus of control. Individuals with a high internal locus of control believe that they themselves control the events which influence their lives. As stated by Thomas et al. (2006), they believe that they are in control of their destiny and are, therefore often confident, alert, and active



in attempting to control their external environments. They tend to see a strong connection between their actions and the consequences of those actions. Individuals with an external locus of control believe that the events that affect their lives are out of their control. They believe that such events cannot be predicted or controlled. As stated by Thomas et al. (2006), they believe that they do not have direct control over their destiny and see themselves in a passive role about the external environment. Individuals with an external locus of control are less careful, affected by group members, easily influenced by external forces, less self-confident, and display erratic as well as unsteady performance (April et al., 2012). Locus of control has long been identified as one of the most dominant entrepreneurial characteristics (Venkatapathy, 1984). As entrepreneurs, individuals with an internal locus of control, believe that they have full control over their outcome of success, thus have a more positive attitude to starting a new business.

*Risk propensity* is defined as “the perceived probability of receiving the rewards associated with the success of a proposed situation, which is required by an individual before they will subject themselves to the consequences associated with failure, the alternative situation providing fewer rewards as well as less severe consequences than the proposed situation” (Brockhaus, 1980, p. 513). If an entrepreneur is successful, they can potentially gain wealth, independence, and a sense of accomplishment. It is reasonable to assume that tolerance for risk is more common among individuals wanting to become entrepreneurs (De Pillis & Reardon, 2007). However, according to Low and MacMillan (1988), the literature does not support risk-taking as a characteristic of entrepreneurs. This inconsistency may be due to a lack of agreement on the definition of risk. Palich and Bagby (1995) counter the traditional thinking and found that low-risk propensity tended to drive entrepreneurs to view business situations more positively.

*Innovativeness* can be described as a personal trait of an individual who can create and is willing to try out a new idea before others do (Amabile et al., 1996). Innovators possess the ability to successfully implement creative ideas. Kropp et al. (2006) found that more innovative entrepreneurs are more successful than their less innovative counterparts. The terms entrepreneur and innovator tend to be interlinked in the literature.

*Proactivity* describes the personality characteristic of an individual who scans for opportunities, shows initiative, takes actions, perseveres until they reach closure bringing about change, and is relatively unconstrained by situational forces (Bateman & Crant, 1993). Product innovation research has repeatedly emphasised the proactive nature of individuals who act as change agents or product champions (Frohman, 1997; Howell & Higgins, 1990). Individuals who show proactive characteristics are also found to be innovative. Bateman and Crant (1993) conclude that proactive individuals were found to tend to engage in actions such as identifying opportunities, challenging status quo, innovation, career management, and tend to go beyond normal expectations or requirements. The consensus from literature is that there is a strong correlation between entrepreneurial intent and proactivity.

*Overconfidence and narcissism* are considered negative personality traits. Narcissism represents “a personality disturbance characterised by an exaggerated investment in one’s image at the expense of the self” (Miller, 2008, p. 4). Overconfidence differs from self-confidence due to the cognitive bias that influences the decision-making process. Self-efficacy and optimism, differ in that they are related to individuals' confidence in their ability to perform a role or task. Overconfidence and narcissism can propel individuals to more innovative venture situations where these qualities are most disadvantageous to success. They are likewise, deterred from more recognisable venture situations where these qualities are least damaging and may even enable venture success (Navis & Ozbek, 2017).

*Impulsivity* is defined as “a concept that encompasses a multitude of behaviours or responses that are poorly conceived, premature, inappropriate, and that frequently result in unwanted or deleterious outcomes” (Kirzner & Israel, 1973, p. 354). Wiklund et al. (2017) propose the idea that entrepreneurship is acutely attractive and suitable for people showing high impulsivity in terms of sensation seeking and lack of premeditation. They find uncertainty attractive and can master it.

### **3.3 Opportunity versus necessity-driven entrepreneurship**

Hessels et al. (2008) utilise the GEM to propose the indicators for the incidence of various entrepreneurial motives expressed as a percentage of TEA. The GEM survey asks respondents whether they are involved in a start-up to take advantage of a business opportunity or because they have no better choices for work. Those that indicate that they are involved in a start-up to take advantage of a business opportunity are considered to be driven by an opportunity motive. Those that indicate that they are involved in a start-up because they have no better choices for work are classified as necessity motivated entrepreneurs.

Hessels et al. (2008) propose three indicators for the incidence of various entrepreneurial motives expressed as a percentage of TEA. A necessity motive is indicated by the share of early-stage entrepreneurs that indicate participation in an entrepreneurial activity primarily because they have no other options for work. An independence motive is indicated by the share of early-stage entrepreneurs for whom independence is the main motive for becoming an entrepreneur. An increase-wealth motive is indicated by the share of early-stage entrepreneurs who indicate that their prime motive for being or becoming an entrepreneur is to increase wealth.

As defined by Uhlaner and Thurik (2007), pull factors (or opportunity factors) are concerned with the expectation of being better off as an entrepreneur. Individuals are attracted to entrepreneurship with the hope of achieving greater material or non-material benefits and therefore can be seen as positive motivation. Pull factors include the independence associated with being an entrepreneur, looking for a challenge, personal satisfaction and are seen to be individually driven, rather than influenced by the external environment. Gross domestic product growth is found to have a positive impact on opportunity entrepreneurship (Van Stel et al., 2007).

Push factors (or necessity factors) consider the conflict between the individual's current state and desired state and are often connected with some level of discontent. They are driven by environmental factors rather than individual driven. Push factors include dissatisfaction with unemployment or with current employment, insufficient income, redundancy and in these scenarios entrepreneurship is seen as a last resort. Necessity entrepreneurship is more common in

lower-income countries and decreases with the level of economic development (Wennekers et al., 2005). During recessions push factors are the primary source of entrepreneurial motivation. Fairlie (2013) established that during the U.S. recession between 2006 and 2009 the unemployment rate increased by 100% whereas the rate of entrepreneurship increased by 16%. Devece et al. (2016) established that more entrepreneurial opportunities exist during a recession but surmised that push motivated entrepreneurs perform poorly. Therefore, entrepreneurial interventions (i.e. activities that promote entrepreneurship) that focus on pull factors have the greatest potential for success. This does not necessarily indicate failure, but results show that necessity undertakings have limited prospects for significant growth. This does not hold true during economically successful times where necessity-driven entrepreneurs with promising prospects are common.

## **4. Role Models**

### **4.1 The concept of role models and its application in research**

Role models inspire individuals to set and accomplish ambitious goals. The term role model was first coined in the 1950s by Merton (1957) who defined role models as examples of the behaviour associated with certain roles. As suggested by Addis (1996) the popularity of the concept has been inversely related to its clarity. The conventional idea of a role model is of an individual in a prominent role or position, for example, a sports person, a surgeon, a parent, or a teacher who provides an example for others to replicate. The term has been widely used since then but with diverging meanings and in general did not take into account the attributes of the role aspirant. To confuse matters further, the terms behavioural model, role model, and mentor have been used interchangeably.

The role model concept has applications in the field of sport (De Bosscher et al., 2006; Mutter & Pawlowski, 2014), education (Ehrenberg, 1995; Spencer, 2003), career development (Gibson, 2004; McCullough, 2013), and medicine (Wright et al., 1997; Wright et al., 1998). Professional role models in sports are seen to have a positive effect on the desire to participate in amateur sport, but other motivating factors are required in order for this desire to become active participation. Role models have more of an influence at early stages of education, and their influence is seen to diminish at the later stages. Role modelling has the potential to help individuals take responsibility for their career progression by facilitating their growth and development. According to McCullough (2013) data suggests that role models matter regarding learning work-related skills and personal development, while also helping to increase career motivation and career-self efficacy. As concluded by Wright et al. (1997), exposure to role models in a specific clinical field is strongly associated with medical students' choice of clinical field for residency training. Knowing which characteristics students look for in their role models helps identify the physicians who may be most influential in medical students' career choice.

## 4.2 Differentiating role models, behavioural models, and mentors

The terms behavioural model, role model, and mentor have been used interchangeably in research. It is critical at an early stage that the three phenomena are differentiated and defined. The procedures for behavioural models and mentors are described and then differentiated from role models. Role models have unique characteristics that distinguish them from behavioural models and mentors. A mentor can be defined as a person who provides advice and support to an understudy through a cooperative relationship. Gibson (2004) outlines the characteristics differentiating the three targets in relation to professional career development (see Table 2). This Table is useful in determining if the individual being aspired to is a role-model, a behavioural model, or a mentor and will help set the scope for this research study by focusing solely on role models. There is some level of similarity. Mentors may, or may not, be considered as role models. Identifying with a role model may involve some level of imitation or behavioural modelling. Gibson (2004, p134) defines “a role model as a cognitive construction based on the attributes of people in social roles an individual perceives to be similar to themselves to some extent and desires to increase perceived similarity by emulating those attributes”.

According to Bandura and Walters (1977), behavioural modelling relies on matching actions and attitudes between an individual and a model. Individuals form rules of behaviours by observing the actions of others. These actions are then transferred into verbal images or symbols by the individual that can then be memorised and translated into strategies for future behaviour (Bandura, 1986). Mullen (1998) describes a mentor as a one-to-one relationship between a more experienced member (mentor) and a less experienced member (protégé) of an organisation or profession. The mentor promotes the protégé’s career development by coaching, supporting, and guiding the protégé. Mentor-initiated connections result in higher levels of mentoring activities than do protégé-initiated connections. Thus, the actions of the mentor essentially determine the quality of the connection. Kram (1988) identified conventional mentors as senior people who help junior individuals navigate psychosocial and professional-related issues in organisations.

As outlined by Gibson (2004), another distinguishing factor is the possible number of development targets. Individuals learn more from multiple behaviour models depending on their availability.

Discussion on mentors has typically focused on the relationship with one or two principal mentors. Early investigations indicated that individuals identify with a few influential role models. Bucher and Stelling (1977) found that individuals identify with multiple role models rather than a few influential ones. A diverse range of role models leads to distinctive attitudes and styles that an individual can adjust to their evolving professional style (Ibarra, 1999).

	<b>Behavioural Model</b>	<b>Role Model</b>	<b>Mentor</b>
<b>Defining Process</b>	<i>Observation and learning</i> ; based on the capabilities of the target and desire to learn by the individual	<i>Identification and social comparison</i> ; based on perceived similarity and desire to increase similarity by the individual	<i>Interaction and involvement</i> ; based on an active interest in and action to advance the individual's development
<b>Potential number</b>	Multiple, depending on availability	Multiple; individual seeks required diversity	Typically one or two primary
<b>Attributes sought in the target by the individual</b>	Task skills; demonstrated high organisational performance levels	Role expectations; self-concept definition	Development functions; psychosocial functions
<b>Length of interaction between parties</b>	Short-term	Variable	Typically long-term
<b>Flexibility in selection</b>	Little	High; somewhat shaped by consequence	Moderately high; substantially shaped by consequence
<b>Awareness</b>	Usually explicit awareness by both parties	Typically one-way on the part of the observing person	Usually explicit awareness by both parties

Table 2: Characteristics differentiating the three development targets (Sourced from Gibson, 2004)

### 4.3 Dimensions of role models

Conventional research focuses on the positive role model. Gibson’s definition emphasises individual perceptions as critical to defining role models and proposes a variety of distinctive types of role models, each contingent on the needs and desires of the individual. Table 3 summarises the dimensions of role models with criteria.

<b>Cognitive Dimensions</b>	
<p><b><i>Positive</i></b></p> <p>Refers to a role model having attributes which are perceived by the individual as similar, are admired and sought out for possible emulation</p>	<p><b><i>Negative</i></b></p> <p>Refers to a role model having attributes which are primarily observed by the individual as examples of how not to behave in a particular context</p>
<p><b><i>Global</i></b></p> <p>Refers to a variety of attributes in a role model which are attended to by the individual, including skills, traits, and behaviours</p>	<p><b><i>Specific</i></b></p> <p>Refers to a single or small set of attributes in a role model which are attended to by the individual</p>
<b>Structural Dimensions</b>	
<p><b><i>Close</i></b></p> <p>Refers to a role model who is in the same operational environment, and/or with whom the individual interacts with frequently</p>	<p><b><i>Distant</i></b></p> <p>Refers to a model who is outside the individual’s operational environment, and with whom the individual interacts infrequently or not at all</p>
<p><b><i>Up</i></b></p> <p>Refers to a role model who is higher in hierarchical status than the individual</p>	<p><b><i>Across/down</i></b></p> <p>Refers to a role model who, in relation to the individual, is a peer, a subordinate, or who is ambiguous in status (e.g., a client)</p>

Table 3: Dimensions of role models with criteria (Sourced from Gibson 2004)

Cognitive dimension is a measurement of social capital theory used to provide a method of examining relationships by analysing their shared values, beliefs, and norms. Structural dimension is a measurement of social capital theory that is used to examine structural environment of a network, i.e. the quantity and quality of the relations. Within these two categories, Gibson (2004, p. 143) identifies two dimensions, “positive/negative and global/specific role models, and close/distant, up/across-down role models”. By reading the dimensions in Table 3, it can be noted



that traditional studies have focused on the left column of these dimensions, i.e. positive, global, close, and hierarchically superior role models. Less attention has been focused on negative, specific, distant and cross hierarchical role models. It is important that both dimensions be taken into account as both plays important roles in role model motivation. Typically, when people have a positive view of role models, they perceive a similarity to that person as satisfying. As outlined by Merton (1968), both positive and negative role models are useful in helping individuals to learn. Negative role models represent behaviours and attitudes that the individual looks to avoid.

#### **4.4 Role model research in the field of entrepreneurship**

Initial exploration reveals that empirical research aimed at establishing the importance of role models for nascent entrepreneurs is scarce and inconclusive. The role model literature has limitations. It is disjointed and lacks a clear definition on what role models are and what they can do. Irvine (1989, p.52) states that “the concept of role model is an ill-defined and imprecise term that begs for more clarity and debate”. According to Bosma et al. (2012), three streams of literature about the influence of role models on entrepreneurs is evident. The first stream relates to the effect of parental role models. They propose that mentoring role models are more likely to be family members providing strong links. Two out of five entrepreneurial role models emerge from strong links of family members and friends. Starting a business is positively correlated with having parents who are or were entrepreneurs (Chlosta et al., 2012; Hoffmann et al., 2015). They surmise that growing up in an entrepreneurial family offers the opportunity to learn from the self-employed parent serving as a role model and getting a real job perspective of self-employment. Tarling et al. (2016) found that individuals attachment to business and family business values are strongly formed concepts that motivate and drive entrepreneurial direction.

The second stream relates to how networks and peer groups provide role models that influence the decision to become an entrepreneur (Falck et al., 2012; Kacperczyk, 2013; Kim & Aldrich, 2005). The third stream of research indicates that role models are associated with the environment that individual is operating in. As summarised by Bosma et al. (2012), the decision to become an entrepreneur is related to the availability of role models, and this varies across clusters, regions and countries. In other words, a region with high levels of entrepreneurship may further encourage

new entrepreneurial initiatives because it is easier to find an appropriate example or obtain information or resources from other entrepreneurs.

These empirical studies loosely suggest a positive influence of role models on the decision to become an entrepreneur but a link between role model influence and entrepreneurial intent is inconclusive. Many studies fail to take into account the individual determinants of entrepreneurship such as the personality traits of the entrepreneurial role model and the entrepreneurial aspirant.

According to Gibson (2004, p. 136), “the role model concept is founded on two separate theoretical constructs; the concept of role and the tendency of individuals to identify with people in important roles; and the concept of the psychological matching of cognitive skills and patterns on behaviour between a person and an aspiring individual”. These two aspects outline two distinctive theoretical backgrounds. Role identification theories (Foote, 1951; Kagan, 1958) stress the idea that people are attracted to individuals whom they perceive similarity to, in terms of their attitudes, behaviours, goals, or the attraction of their status position, and are motivated to enhance that similarity through observation and emulation. The second modelling theories propose that individuals listen to models because they can be useful in learning new skills (Bandura, 1986; Bandura & Walters, 1963). Identification theories place more importance on the motivational aspect of role modelling, and modelling theories emphasise the learning aspects.

## 5. Theory

### 5.1 Theory of planned behaviour

In the psychological literature, intentions have proven the best predictor of planned behaviour, particularly when that behaviour is rare, hard to observe, or involves unpredictable time lags (Krueger et al., 2000). Krueger (2007) emphasises that after the entrepreneurial action are entrepreneurial intentions. Two dominant models of entrepreneurial intentions are evident; Ajzen's (1987) theory of planned behaviour and Shapero and Sokol's (1982) model of entrepreneurial event.

Ajzen's (1987) theory of planned behaviour identifies three antecedents of intention (see Figure 1). The first is the personal attitude toward outcomes of the behaviour. This is determined by the total set of accessible behavioural beliefs linking entrepreneurial behaviour to various outcomes and other attributes. Also, the strength of each belief is weighted by the evaluation of the outcomes (Ajzen, 1991; Fayolle et al., 2014). The second is the personal attitude toward outcomes of the perceived social norms. Ajzen (1991) defines social norms as "the individual's perception of the social pressures to engage (or not to engage) in entrepreneurial behaviour". It comprises of normative beliefs and the motivation to comply with these beliefs. The third is the perceived behavioural control reflecting perceptions that the behaviour is personally controllable.

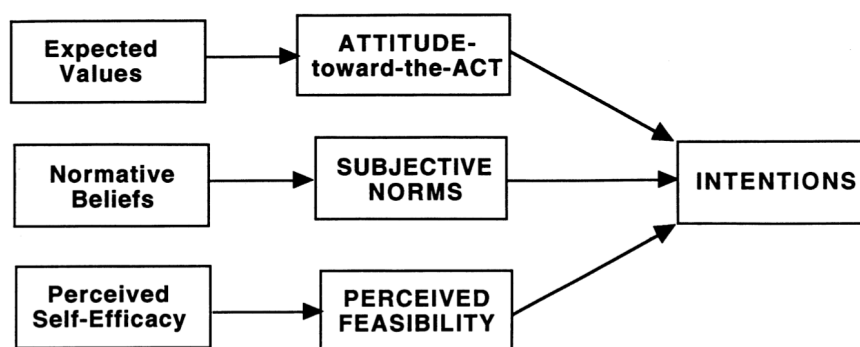


Figure 1: Theory of planned behaviour, Ajzen (1987)

Shapero and Sokol's (1982) model of the 'Entrepreneurial Event' is a model of intention, specific to the entrepreneurship domain. In the Shapero and Sokol (1982) entrepreneurial event, intentions to start a business derive from perceptions of desirability and feasibility and from a propensity to act upon opportunities (Fayolle et al., 2014; Shapero & Sokol, 1982). Shapero and Sokol (1982) defined perceived desirability as the personal attractiveness of starting a business, including both intrapersonal and extrapersonal impacts. They defined perceived feasibility as the degree to which one feels personally capable of starting a business. The model assumes that inertia guides human behaviour until something interrupts or "displaces" that inertia. Displacement can be negative, for example, the end of a marriage or loss of employment, or positive, for example receiving an inheritance. The choice of behaviour depends on the relative "credibility" of alternative behaviours for the decision maker plus a "propensity to act" without which a significant action may not be taken. Shapero and Sokol (1982) conceptualised "propensity to act" as the personal disposition to act on one's decisions, thus reflecting volitional aspects of intentions. They suggest locus of control as a well-established conceptualisation of this phenomena. "Credibility" requires a behaviour to be perceived as both desirable and feasible. Entrepreneurial events, therefore, require the potential to start a business (credibility and propensity to act) to exist before the displacement and propensity to act afterwards (Shapero & Sokol, 1982).

## **5.2 Reinforcement Theory**

Reinforcement theory, as proposed by Skinner (1963), is the process of changing someone's behaviour by using reinforcement, punishment, and extinction. The desired behaviour is reinforced using rewards. Undesired behaviour is prevented using punishments and extinction relates to preventing a learned behaviour by withholding the positive reinforcement that encouraged the behaviour. As surmised by Luthans and Stajkovic (1999, p. 56), in management practice, "you *may* get what you reward, but you *do* get what you reinforce". They argue that pay for performance may not always lead to performance improvement, but reinforcing for performance will always improve performance.

### **5.3 Social exchange theory**

The social exchange theory entitled equity theory was first propositioned by Adams (1965). He proposed that equity is achieved if the ratio of one's rewards (outcomes) to one's costs (inputs) is equal to a partner's reward to costs ratio. Tension occurs when inequity exists as one party feels under-benefited and the other over-benefited, leading to feelings of guilt. The decrease in motivation is seen to be directly proportional to the level of inequality. Opponents of this theory argue that the premise that individuals are selfish and self-motivated is not evident. Also, the closeness of the relationship between the individual and the partner plays an important role in the perceived inequity.

### **5.4 Goal setting theory**

Goal setting theory states that a specific, challenging goal leads to higher performance than a specific easy goal, a vague goal such as the encouragement to do your best, or setting no goal at all (Latham, 2016). The theory developed by Locke (1968), proposed that an individual's conscious ideas regulate his actions and monetary incentives, time limits, and knowledge of results do not affect performance level independently of the individual's goals and intentions. Goals have two main characteristics; content and intensity. Content refers to the nature of the activity or the desired end. Intensity refers to the level of importance of the goal to the individual. Goal content applies an initial directive influence and determines the effort that is required to be expended because different goals require different amounts of effort. Goal intensity effects both the direction and the level of effort. Important goals are more likely to be accepted.

### **5.5 Expectancy-value theory**

Motivational theories focusing on expectancy-value theories were chosen as the most applicable as most entrepreneurship motivation research focuses on the personality traits associated with expectancy of success and the value of that success. As originally proposed by Vroom (1964), expectancy theory encompasses two related models; the valence model and the force model. The valence model endeavours to increase the perceived attractiveness of an outcome by combining

the attractiveness of all the related resultant outcomes. The force model of expectancy theory “attempts to increase the motivational force to act by associating the expectancy of resultant outcomes and their valences” (Geiger & Cooper, 1996, p. 114).

Table 4 summarises the dominant expectancy and expectancy-value theories of motivation (Eccles & Wigfield, 2002). These theories reason that the two main factors influencing motivation are the expectations of success and how the perceived rewards of that success are valued. Atkinson (1957) was one of the first proponents of the expectancy-value theory. He concluded that expectancies and values are inversely related to each other. Later studies countered this and determined that expectancies and values are positively related. Eccles and Wigfield (2002) provide an overview of expectancy-value theories of motivation. They state that expectancy theories focus on individuals’ beliefs about their competence and efficacy, expectancies for success or failure, and sense of control over outcomes. When people ask if they can carry out a task and conclude that they can, then they perform better and are then motivated by more challenging tasks.

Eccles et al. (1983) defined expectancies for success as “individuals’ beliefs about how well they will do on upcoming tasks, either in the immediate or longer-term future.” She defined beliefs about ability as individuals’ evaluations of their competence in different areas. Values refer to an individual’s perceived desirability of the outcomes of success. She outlines four components of task-value: attainment value, intrinsic value, utility value, and cost. She defines attainment value as “the personal importance of doing well on the task”. Intrinsic value is the personal fun, or challenge one gets from the task. Utility value is determined by how well a task relates to current and future goals.

According to Eccles and Wigfield (2002), all choices are assumed to have costs associated with them as one choice may rule out other options. In the case of choosing entrepreneurship as a career path, students eliminate the option of regular employment and the security of a known salary. Cost is related to the negative aspects of choosing entrepreneurship, i.e. will I be able to perform the

	<b>Theory</b>	<b>What it says</b>
<i>Theories focused on Expectancy</i>	Self-Efficacy Theory	Self-efficacy is defined as individuals' confidence in their ability to organise and execute a given course of action to solve a problem or accomplish a task. <i>Bandura (1997)</i>
	Control Theories	One should expect to succeed to the extent that one feels in control of one's successes and failures (i.e., one has an internal locus of control). <i>Crandall et al. 1965, Rotter 1966</i>
<i>Theories Integrating Expectancy and Value Constructs</i>	Attribution Theory	The individual's causal attributions (or explanations) for achievement outcomes determine subsequent achievement strivings and, thus, are key motivational beliefs. <i>Weiner 1992</i>
	Modern Expectancy-Value Theory	Choices are assumed to be influenced by both negative and positive task characteristics, and all choices are assumed to have costs associated with them precisely because one choice often eliminates other options. Consequently, the relative value and probability of success of various options are key determinants of choice. <i>Eccles et al. 1983; Meece et al. 1990</i>
	Self-Worth Theory	The motive for self-worth defined as the tendency to establish and maintain a positive self-image, or sense of self-worth. <i>Covington 1992, 1998</i>

Table 4: Summary of dominant expectancy and expectancy–value theories of motivation (Sourced from Eccles and Wigfield, 2002)

task, will I fail or succeed, how much effort will it require and what are the lost opportunities of me making this choice? Subsequently, the choice they make depends on the relative value and probability of success.

## **5.6 Motivation theory of role modelling**

Morgenroth et al. (2015) examine how role models are a method of motivation. Their research is an extension of the expectancy-value theoretical framework, and they propose a new theoretical framework, the motivational theory of role modelling which emphasises how the power of role models can be utilised to increase role aspirants' motivation, reinforce their existing goals, and facilitate them adopting new goals. Their research has been cited in numerous studies including the lack of visibility of female gamers due to a lack of role models (Paaßen et al., 2017), teachers influence on personal meaning, future intention, and active engagement of their students (Moran, 2016), and successful aging role models (Jopp et al., 2016) but evidence of successful testing of the model in current literature is scarce. It is proposed that this research study will test the motivation theory of role modelling investigating the influence of role models on entrepreneurial intent.

Figure 2 illustrates how the role model process is of a cyclical nature, such that exposure to role models changes expectancies, values, and goals, which can at the same time be thought of as role aspirant attributes, and thus influence the perception of role models. They define role aspirants as an individual who makes active, although not necessarily deliberate, choices about in whose example to follow based on their values and goals. They argue that role models have three distinct functions: acting as behavioural models, representing the possible, and being inspirational. They then discuss how role models can contribute to the role aspirants' expectations of success (i.e., expectancies) and the desirability (i.e., value) of their achievement-related goals.



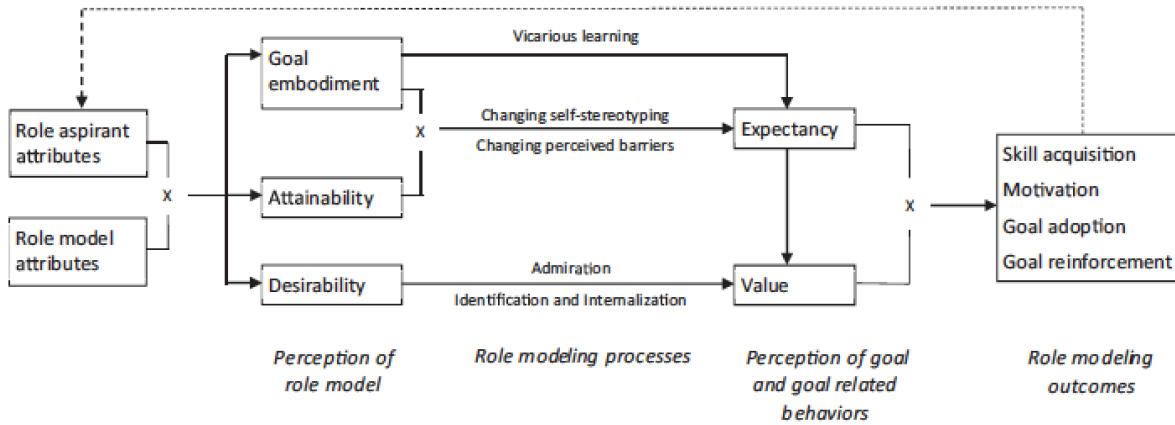


Figure 2: Illustration of the Motivation Theory of Role Modelling as proposed by Morgenroth et al. (2015)

Role models act as behavioural models. Role aspirants are originally motivated to pursue a certain goal and role models show them how to achieve this goal. Role models represent what is possible. In this aspect, it is not concerned with learning how we do something but learning that something is possible. They propose that as inspirations, role models contribute to the acquisition of new goals, i.e. not only do they make something desirable seem more achievable but they also make something new desirable in the first place.

The theoretical framework proposed by Morgenroth et al. (2015) indicates that before knowing the type of intervention that is most effective, one must first decide on whether you are motivating role aspirants toward an existing goal or assisting them to adopt a new one. They cite the example of motivating girls to choose STEM educational paths and retaining women in STEM fields. In the case of motivating girls to choose STEM educational paths, it is important to make goals both attainable and desirable, i.e. to increase both expectancy and value. In this case, role models with attributes that are both desirable and attainable should be chosen. Instead, interventions targeting the retention of women in STEM fields must promote expectations of success as success in this situation is already highly valued.

Value based on goal embodiment refers to the enjoyment and interest associated with a goal. Value based on goal attainment refers to reasons for pursuing a goal that is linked to the outcome of the

goal rather than the goal itself. Finally, they argue that a role model's usefulness in influencing these factors depend on how they are perceived by the aspirant.

In summary, Morgenroth et al. (2015) offer four propositions:

1. Perceived goal embodiment influences expectancy, and in turn motivation and goals, by prompting vicarious learning.
2. Perceived goal embodiment and perceived attainability interact to influence expectancy, and in turn motivation and goals, by changing self-stereotyping.
3. Perceived goal embodiment and perceived attainability interact to influence expectancy, and in turn motivation and goals, by changing perceived external barriers.
4. Perceived desirability influences value, and in turn motivation and the adoption of new goals by promoting the related processes of personal identification, internalisation, and admiration.

Role models need to personify a role aspirant's already existing goals to function as behavioural models. From an entrepreneurial viewpoint, they would need to be successful entrepreneurs. Through vicarious learning experiences, the role aspirant's self-efficacy is expected to increase. This, in turn, increases motivation to work toward their already existing goal. Typically, as the role aspirant enjoys the things they perceive they are good at, this is likely to increase the value role aspirants associate with the goal in question. Also, vicarious learning is also likely to lead to skill acquisition.

## **6. A proposed conceptual framework**

### **6.1 The Individual Entrepreneurial Intent Scale (IEIS)**

Progress in identifying the individual cognitions, personality traits, personal circumstances, and environmental conditions associated with entrepreneurship have been hindered by the lack of a consistent metric for its measurement (Bruyat & Julien, 2001). Entrepreneurial intent will be an important concept in this research study. A corresponding construct will be critical in applying measurement to entrepreneurial intent. Therefore, a suitable scale will be required. Numerous models of entrepreneurial intentions have been offered in the entrepreneurship literature. As detailed by Valliere (2015) modern studies have used measures of attitudes (assessing personal and social norms and desires), of behaviour (assessing performed actions), of future expectations (assessing likely outcomes without reference to personal agency), or combinations of all three. Valliere (2015) summarises the literature on entrepreneurial intent, and the results are outlined in Table 5. Thompson (2009) aimed to create a consistent definition of intent and a uniform and reliable way to measure individual entrepreneurial intent. Thompson (2009, p. 676) defines entrepreneurial intent as “a self-acknowledged conviction by a person that they intend to set up a new business venture and consciously plan to do so at some point in the future”. His IEIS (Individual Entrepreneurial Intent Scale) features ten items that are a combination of “direct measures of intention and measures of behaviours that strongly imply intentions, with no measures of beliefs or attitudes confounding the operationalization” (Valliere, 2015, p. 135) According to Valliere (2015) this represents a significant improvement over former operationalisations of entrepreneurial intent with greater construct validity. Thompson’s scale is the most widely applied particularly in the area of the role of education on entrepreneurial intent (Küttim et al., 2014; Liñán et al., 2011; Lorz & Volery, 2011; Vanevenhoven & Liguori, 2013) which aligns closely with this proposed study.

The IEIS was developed. International focus groups were first used, and the final ideas fell into four broad categories; those directly asking about intentions or plans to start a firm, those related to learning about starting a firm, those related to looking for business opportunities, and those relating actively to gathering initial resources to start a firm. A questionnaire incorporating these

ideas was sent to 450 subjects selected randomly from a large international sample, with 102 useable responses from a diverse group. From further testing, Thompson (2009, p. 687) concluded that the IEIS was shown to “incorporate high content validity, plus broad applicability across populations by nationality, age, and occupation”. Furthermore, the items selected “help maximise general applicability to most individuals with entrepreneurial intent regardless of the stage of which they might have advanced regarding setting up a firm”. Based on its extensive use in entrepreneurship literature, particularly in the field of education, and its high construct validity it is proposed that Thompson’s IEIS will be utilised to determine entrepreneurial intent for this study.

<b>Study</b>	<b>Operationalization of Entrepreneurial Intent</b>
<i>Autio, Keeley et al. 2001</i>	Expectation (4-item scale of likelihoods: 1 and 5 years out, full and part time, Likert)
<i>Kennedy, Drennan et al. 2003</i>	Expectation (2 items, likelihoods 5 and 10 years out)
	Behaviour (considered entrepreneurship, Likert)
<i>Lüthje and Frank 2002, 2003</i>	Intention (try to launch ever, dichotomous)
	Expectation (likely to start business ever, Likert)
<i>Liñán and Chen 2009</i>	Attitude (ready for anything, Likert)
	Intention (professional goal, Likert)
	Intention (try hard to start up, Likert)
	Intention (try to launch ever, Likert)
	Intention (start up ever, Likert)
	Behaviour (considered entrepreneurship, Likert)
<i>Thompson 2009</i>	Intention (start a business, Likert)
	Behaviour (search for opportunities, Likert)
	Behaviour (saving for start-up capital, Likert)
	Behaviour (study how to start up, Likert)
	Behaviour (planned to launch, Likert)
	Behaviour (read about how to start, Likert)
<i>Días-García and Jiménez-Moreno 2010</i>	Behaviour (considered entrepreneurship, Likert)
<i>Engle, Dimitriadi et al. 2010</i>	Expectation (likelihood 5 years out)
	Behaviour (considered entrepreneurship, Likert)
	Behaviour (planned for entrepreneurship, Likert)

Table 5: Review of entrepreneurial intention (EI) measurements (Sourced from Valliere, 2015)

## 6.2 Concepts, propositions and interpretations

The focus of this research is to examine the extent to which role models can influence an individual's intent to become an entrepreneur. This study will form part of a larger research study. The study will measure the initial entrepreneurial intent of individuals, apply a role model intervention, and determine the effect of this intervention on the entrepreneurial intent of these individuals.

Recurring themes from the literature review were identified and grouped to identify the concepts of this research. Table 6 describes the concepts, propositions and interpretation of this research and the resulting proposed conceptual framework on entrepreneurial role model motivation is shown in Figure 3. By seeing what is achievable, it is proposed that the role aspirant's perceived attainability of entrepreneurial success will increase. Through admiration and internalisation of role model qualities, it is proposed that the desirability of entrepreneurial success will increase. In turn, their entrepreneurial intent will increase.

Based on expectancy-value theory of motivation, individuals will be more inclined to take up entrepreneurship as an alternative career path if they believe they have the competencies to do so, if they expect success, if they sense that they have control over their own success, and finally if they value the rewards of that success. Role models help to improve these perceptions.

Following on from the review of the literature and linking future research to the motivation theory of role modelling, the following propositions are offered;

P<sub>1</sub>: Role models positively influence the role aspirant's perception of their own entrepreneurial competencies.

P<sub>2</sub>: Role models positively influence the role aspirant's expectation of success.

P<sub>3</sub>: Role models positively influence the role aspirant's perception of control over their own success.

P<sub>4</sub>: Role models positively influence the role aspirant's desirability of entrepreneurial success by outlining the rewards and the value of that success.

<b>Element</b>	<b>Identification</b>	<b>Definition</b>
<b>Concept</b>	Role Aspirants	An individual who makes active, although not necessarily deliberate, choices to become an entrepreneur.
	Entrepreneurial Traits	Traits related to entrepreneurial intent include achievement motivation, risk propensity, locus of control, independence motives, increased wealth motives, necessity motives.
	Entrepreneurial Role Models	Entrepreneurial role models serve as examples of the behaviour associated with entrepreneurs. They are inspirational. They represent the possible.
	Entrepreneurial Intent	Intent to start up a venture within the next five years
	Direct Link	Exposure to Entrepreneurial role models will increase the motivation of individuals wanting to become entrepreneurs
<b>Proposition</b>	By seeing what is achievable, it is proposed that their perceived attainability of entrepreneurial success will increase. Through admiration and internalisation of role model qualities, it is proposed that their desirability of entrepreneurial success will increase. In turn, their entrepreneurial intent will increase.	<p>P1: Role models positively influence the role aspirant's perception of their own entrepreneurial competencies.</p> <p>P2: Role models positively influence the role aspirant's expectation of success.</p> <p>P3: Role models positively influence the role aspirant's perception of control over their own success.</p> <p>P4: Role models positively influence the role aspirant's desirability of entrepreneurial success by outlining the rewards and the value of that success.</p>
<b>Interpretation</b>	Role models have an impact on the entrepreneurial intent of individuals to start a business	Based on expectancy-value theory of motivation, individuals will be more inclined to take up entrepreneurship as an alternative career path if they believe they have the competencies to do so, if they expect success, if they sense that they have control over their own success, and finally if they value the rewards of that success. Role models help to improve these perceptions.

Table 6: The concepts, propositions, and interpretation of this research (source: current research)

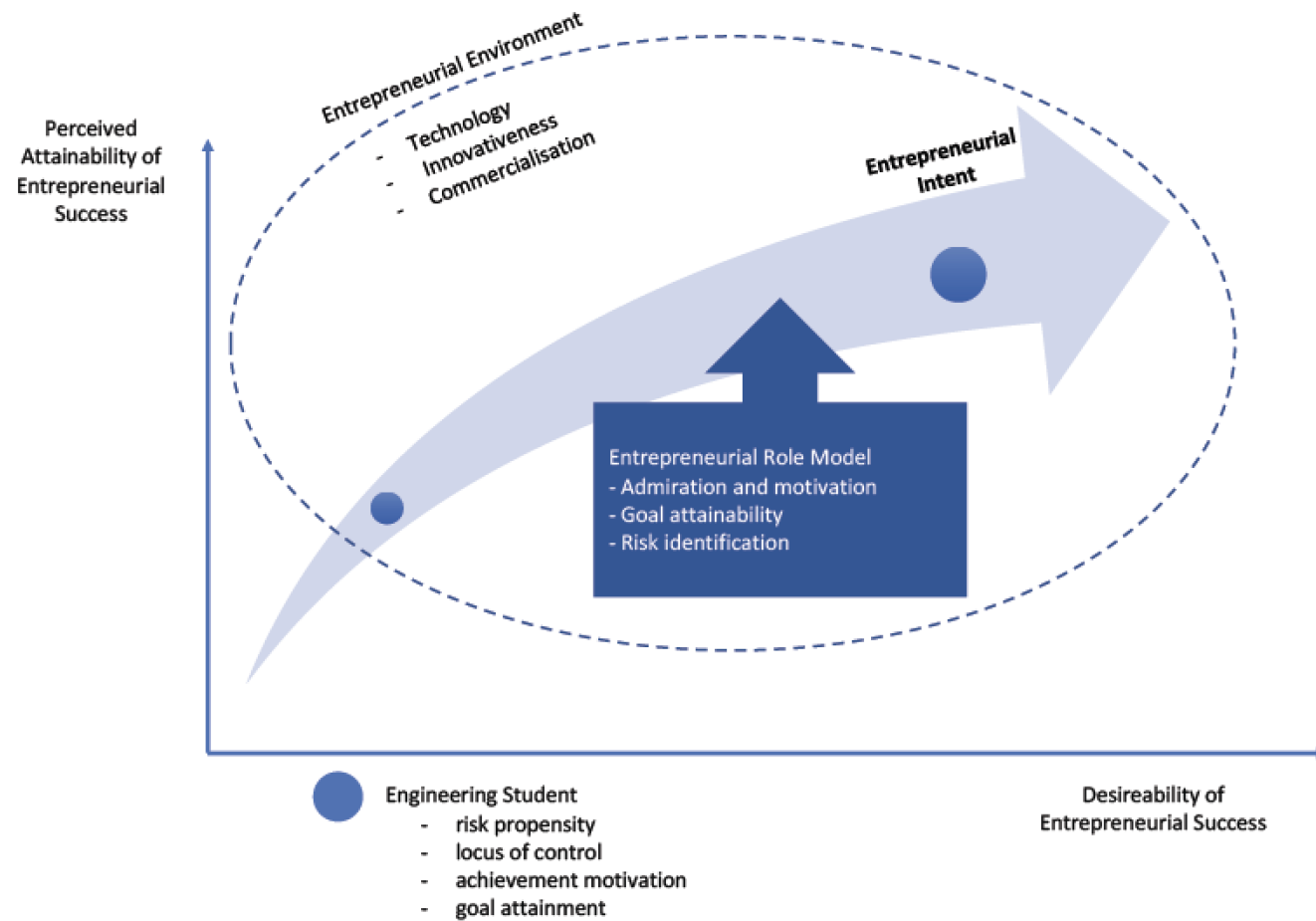


Figure 3: Conceptual Framework *Entrepreneurial Role Model Motivation* (source: current research)

## 7. Conclusion

The purpose of this paper is to examine the extent to which role models influence the entrepreneurial intent of potential entrepreneurs. The research findings indicate that empirical research aimed at establishing the importance of role models for nascent entrepreneurs is scarce. Empirical studies loosely suggest a positive influence of role models on the decision to become an entrepreneur but a link between role model influence and entrepreneurial intent is inconclusive. According to Gibson (2004), diverse historical research emphasises the importance of role models. However, empirical research on this concept has declined, and he suggests that reassessment is required.

This research will aim to be both incremental and practical. An approach of theory testing rather than theory building will be taken. From research of motivation theories, it is concluded that the theoretical framework that best suits further study outlined be that based on expectancy-value theories of motivation. As summarised by Eccles and Wigfield (2002, p. 110), expectancy-value theories of motivation “focus on individuals’ beliefs about their competence and efficacy, expectancies for success or failure, and sense of control over outcomes”. When people ask if they can carry out a task and conclude that they can, then they perform better and are then motivated by more challenging tasks. An extension of the expectancy-value theoretical framework, the motivational theory of role modelling, is examined and it is planned that the testing of this theory will form the basis of further research. Based on this theory, it is proposed that individuals will be more inclined to take up entrepreneurship as an alternative career path if they believe they have the competencies to do so, if they expect success, if they sense that they have control over their own success, and finally if they value the rewards of that success. By seeing what is achievable, it is proposed that the role aspirant’s perceived attainability of entrepreneurial success will increase. Through admiration and internalisation of role model qualities, it is proposed that the desirability of entrepreneurial success will increase.

Following on from this conceptual paper, the research objectives will be specified, and the scope and limitations of the study identified. A suitable research unit of observation will be chosen to test foundation theory, i.e. the motivational theory of role modelling. Research methodologies will be investigated to determine the best-suited approach. Operational details



will then be outlined. It is anticipated that as part of the future study, the initial entrepreneurial intent of individuals will be measured. Role model intervention will be applied, and the effect of this intervention on the entrepreneurial intent of these individuals will be investigated to determine if a link exists.

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## **Preface to paper 2 - Methodology**

The 'Methodology' paper (Paper 2) was developed between June 2018 and March 2019 and was presented for external examination in April 2019. Following initial feedback from examiners, several modifications were made; these are documented below. The feedback offered guidance to the researcher and, on reflection, aided greatly in the researcher's development. The final recommended version of the paper included in this thesis was submitted following amendments based upon examiner commentary.

At this stage in the study, the researcher reflected on their philosophical positioning and how that should link into the methodology of the study. Noblit and Hare (1998, p.12) stated that positivists "seek cause and effect laws that are sufficiently generalisable to ensure that a knowledge of prior events enables a reasonable prediction of subsequent events". This statement, reinforced by the researcher's engineering background, firmly put the researcher in the positivist paradigm. The researcher was intrinsically involved in the study and therefore perceived that he may not be an independent observer. Positivist science assumes that the inquirer is independent of the study but Susman and Evered (1978) argued that people's views cannot be excluded and that action research acts as a corrective to positivistic science deficiencies. A small-scale mixed-methods action research (MMAR) design was therefore initially proposed as the methodology that best fit the study given that the researcher was involved in the process.

As defined by Rapoport (1970, p.499), "Action research aims to contribute both to the practical concerns of people in an immediate problematic situation and to the goals of social science by joint collaboration within a mutually acceptable ethical framework." Ivankova (2014) proposed a framework for mixed-methods action research (MMAR) design based on the cyclical methodological steps first proposed by Lewin (1948). The framework incorporates the combination of the two approaches by integrating mixed-methods research into each step in the action research process. The framework is demonstrated in Figure 1 with solid arrows representing the cyclical sequence of the phases and the dashed arrows representing other possible iterations of research activities. The examiners commented that there was not enough justification for an MMAR design and that the paper read like a "tearful goodbye" to positivism and that apologies should not be made for considering mixed-methods. They argued that the researcher was not involved in the process and was an independent observer. Also, the action

research process is cyclical by nature so it was not possible to carry out more than one iteration as part of the DBA. The comments were reviewed and addressed and instead of being apologetic, the researcher embraced other methodologies.

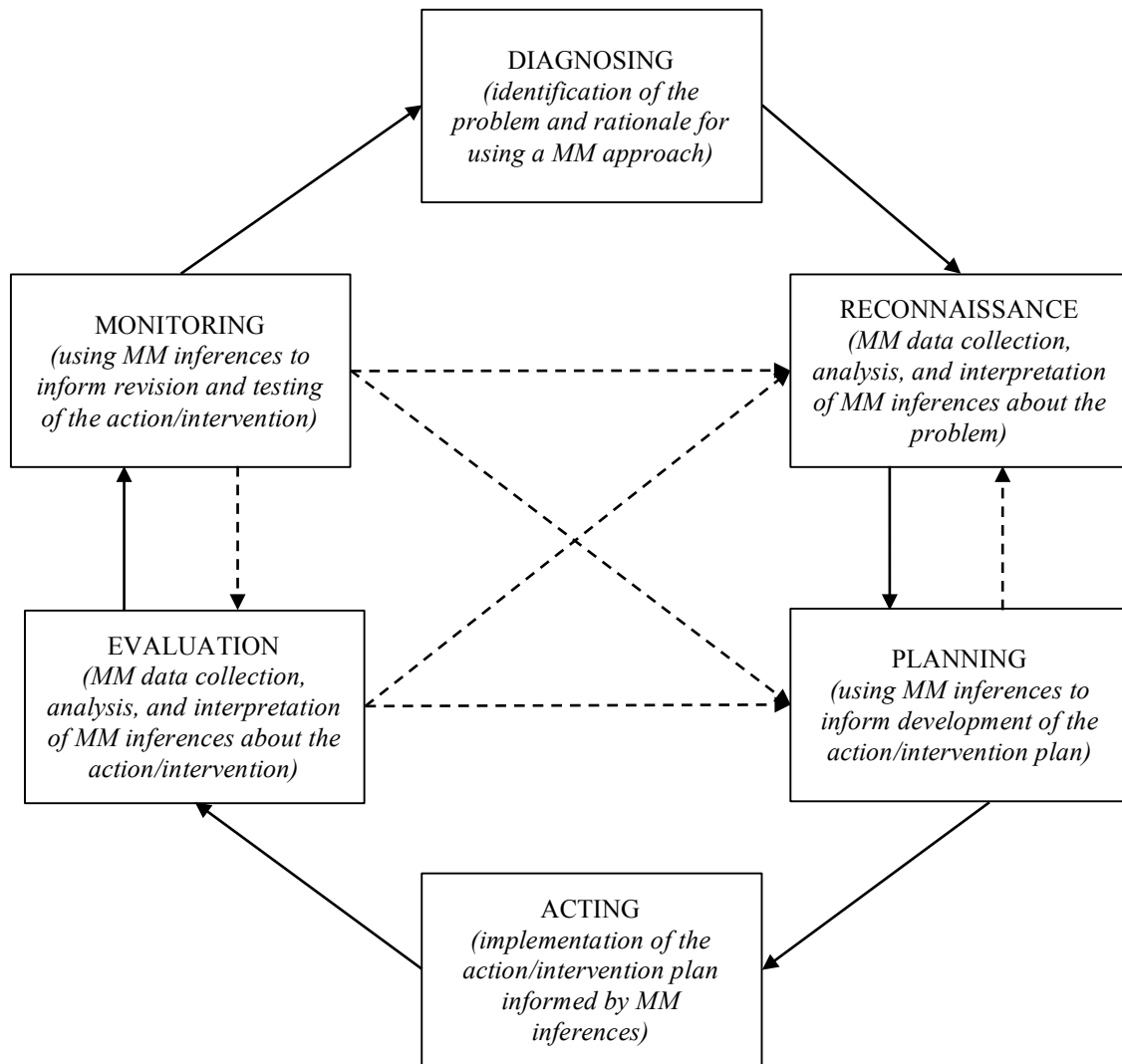


Figure 1: A framework for MMAR design (Ivankova, 2014)

The researcher also considered using an experimentation methodology, but this was ruled out for ethical reasons. Originally third-year students were chosen to participate in the study. These students would be undertaking an entrepreneurial module at the same time as the study was due to take place. An increase in intent for all students was expected due to ongoing entrepreneurial education over the period of the research study. In order to monitor the effect of extraneous variables, it was proposed to randomly divide the cohort into a control group and

an experimental group. The experimental group would be subject to an intervention. The control group would not. The difference in intent between the two groups could then be attributed to the role model intervention. It was highlighted by the examiners that the control group may be at a disadvantage from an educational stance because they are not getting access to the role model lectures. Due to ethical concerns, an experimentation design was ruled out. In order to reduce the extraneous variables as a result of undertaking an entrepreneurial module at the same time as the study, students in the fourth year of a four-year honours degree or a five-year masters in Mechanical & Biomedical Engineering were chosen. These students would not be undertaking any additional entrepreneurial modules at the time of the study.

Adcroft and Willis (2008) argued that positivist philosophies do tend towards certain methodologies but they do not preclude all other methodology options. They surmise that it is possible to be both a positivist and a mixed-method researcher. The change in entrepreneurial intent is quantifiable, but it does not tell the story as to why there is a change. As an objective of the research was to examine “how” role models can be used to motivate students, it was considered that a qualitative element would aid greatly in investigating this. Based on the philosophical position of the researcher and considering the advantages and disadvantages of different approaches, it was decided that the methodology that best suited this research problem was a mixed-methods design.

It is worth pointing out at this stage that significant changes were made to the pilot study originally proposed in the section “Operationalising of this study” (Paper 2, Section 7). Originally it was suggested that the pilot study would consist of semi-structured interviews. It was then proposed to carry out a qualitative data analysis (QDA) on the interview transcripts to identify recurring themes that would be used to develop the questionnaires for the main study. During a review of the ‘Design & Initial Findings’ paper (Paper 3) the examiners suggested that the pilot study should mirror and test the data collection instruments of the main study and for that reason the semi-structured interviews were not used. Instead, the pilot study tested the data collection instruments used in the main study and these are explained in more detail in the preface to paper 3.



At the request of the examiners, the proposed mixed-method design is presented diagrammatically in the paper to assist the reader. The process consisted of four phases; the conceptualisation phase, the investigation phase, the role model intervention, and the evaluation of results phase and each phase is described in detail. It should also be noted that the “Proposed 4 phase mixed-method design” (Paper 2, Section 5, Figure 4), evolved as the DBA progressed. Following the pilot study, changes were made to both the quantitative and qualitative data collection instruments in Phase 4, the “evaluating results phase”. In addition to the quantitative survey to measure Thompson’s (2009) IEIS, the researcher developed a quantitative questionnaire to test the influence that the role model talks had on entrepreneurial intent. The qualitative questionnaire was also changed to a 1,000-word student reflection. More details on the pilot study and these changes to the proposed design are provided in Paper 3, ‘Design & Initial Findings’ and in the preface to the paper. The ‘Methodology Paper’ (Paper 2) will now follow and this preface should give the reader more clarity as to the changes made to the proposed methodology and the reasons for those changes.

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**Paper 2:**  
**Methodology**

**Paper**

**Examination Date:**

**04/04/219**

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Date: 11/03/2019

**RESEARCH PAPER SERIES**

**Paper 2:**

**METHODOLOGY PAPER**

**“A framework for the utilisation of role modelling intervention for the promotion of entrepreneurship as an alternative career path.”**

## ABSTRACT

Entrepreneurial activity is a key driver of economic growth in Ireland but it is at its lowest amongst those aged between 18 and 24. Ireland has an abundance of successful entrepreneurs. Can these successful entrepreneurs influence entrepreneurial intent? The role model concept has been applied as a method of motivation in the field of sport, education, career development, and medicine. A review of the current literature indicates that that empirical research aimed at establishing the importance of role models in influencing the entrepreneurial intent of potential entrepreneurs is scarce. The influence of role models on entrepreneurs is evident in three different streams; parental role models; role models within an individual's own networks and peer groups; and role models associated with the environment that the individual is operating in. Empirical studies loosely suggest a positive influence of role models on the decision to become an entrepreneur but a link between role model influence and entrepreneurial intent is inconclusive

The aim of this paper is to present the application of a mixed-methods research design that will be utilised to examine a link between role model influence and entrepreneurial intent. Based on the philosophical position of the researcher a positivist approach will be undertaken. The unit of observation will be students in a third level Irish educational institute. This research is undertaken as part of a larger doctoral research study by applying mixed-method research on the researcher's own organisation. The research examines how entrepreneurial role models can be used to motivate students to consider entrepreneurship as a career.

**Paper Word Count:** 8,141

## 1. Introduction and plan of the paper

As outlined by Audretsch (2004), entrepreneurial activity is a key driver of economic growth. Countries with a higher occurrence of opportunity-driven entrepreneurship tend to have a higher prevalence of high job-growth (Hessels et al., 2008). This has led to an increased focus on entrepreneurship due to the potential for economic growth and job creation. According to the Global Entrepreneurship Monitor (GEM) 2016 survey of entrepreneurship in Ireland (O'Gorman & Fitzsimons, 2017), entrepreneurial activity in Ireland is at its lowest amongst those aged between 18 and 24. To what extent can role models influence entrepreneurial intent? Morgenroth et al. (2015, p. 4) define role models as “individuals who influence role aspirants’ achievements, motivation, and goals by acting as behavioural models, representations of the possible, and/or inspirations”. Thompson (2009, p. 676) defines entrepreneurial intent as “a self-acknowledged conviction by a person that they intend to set up a new business venture and consciously plan to do so at some point in the future”.

A comprehensive literature review of research in the area of role modelling, entrepreneurship, and motivation theory of role modelling indicates that empirical research aimed at establishing the importance of role models influencing the entrepreneurial intent of potential entrepreneurs is scarce. Empirical studies loosely suggest a positive influence of role models on the decision to become an entrepreneur but a link between role model influence and entrepreneurial intent is inconclusive leading to the research question:

*Can role models increase the desirability of entrepreneurial success of students, through admiration and internalisation of role model qualities and increase students’ perceived attainability of success by seeing what is achievable?*

Following on from the conceptualisation of the study, the following propositions are offered;

P<sub>1</sub>: Role models positively influence the role aspirant’s perception of their own entrepreneurial competencies.

P<sub>2</sub>: Role models positively influence the role aspirant’s expectation of success.

P<sub>3</sub>: Role models positively influence the role aspirant’s perception of control over their own success.

P<sub>4</sub>: Role models positively influence the role aspirant's desirability of entrepreneurial success by outlining the rewards and the value of that success.

This paper aims to justify a research methodology for examining to what extent can role models influence entrepreneurial intent. Section 2 discusses the philosophical position of the researcher and the philosophical determination for this study. Two opposing philosophical positions, objectivism and subjectivism are discussed and by examining the meta-theoretical assumptions of each paradigm, it is concluded that the researcher's position is in the positivist paradigm.

Section 3 analyses a continuum of research strategies and attempts to assess which methodology best suits the research problem. Mixed-methods are discussed as a means of allowing the researcher to gain breadth and depth of understanding or validation, within a single study or closely related studies. Section 4 attempts to frame the research study and substantiate the benefits of a small-scale mixed-methods study. Section 5 outlines a proposed mixed-method research design and qualitative and quantitative data collection instruments are discussed. Section 6 discusses Thompson's (2009) IEIS (Individual Entrepreneurial Intent Scale) and why it represents a significant improvement over previous operationalisations of entrepreneurial intent with greater construct validity. Section 7 discusses operationalising the research study. Section 8 considers the ethical implications and the measures that will be taken. Section 9 concludes the paper and outlines the next steps of the research study.

## 2. Research Paradigms

As deduced by Holden and Lynch (2004), the researcher's review of philosophy is a vital process as it enriches their research skills and aids in increasing confidence that they are using the appropriate methodology. From literature research, two opposing philosophical positions emerge, objectivism and subjectivism (Burrell & Morgan, 1979), also referred to as positivism and phenomenology (Easterby-Smith & Thorpe, 1991), or positivism and interpretive alternative (Hughes & Sharrock, 1997).

Burrell and Morgan (1979) propose that assumptions about nature of science can be thought of in terms of what they call the subjective-objective dimension and assumptions about the nature of society in terms of a regulation- radical change dimension. The paradigms can be used as a map, providing a tool to establish where one is positioned as a researcher, where one has been and where it is possible to go in the future. The positivist paradigm seeks to provide fundamentally rational explanations of social affairs. It is practical in orientation and is concerned with understanding society in a way which generates knowledge that can be put to good use. It is concerned with the effective regulation and control of social affairs.

Based on an examination of the assumptions proposed by Burrell and Morgan (1979), outlined in Table 1, the researcher believes that their philosophical position is that of a positivist. This is reinforced by the belief that there is one defined reality that is fixed, quantifiable and observable. Knowledge is objective and quantifiable and that the goal of science is to test and expand theory. The researcher believes that subjectivity is misleading and that the researcher should always be an independent observer to his research and in general, favours quantitative research methods.

Chen and Hirschheim (2004) propose that the presence or absence of three constituents; hypothesis, quantitative methods and inferences made from sample to general population, can help to identify if a study can be categorised as positivist research. Noblit and Hare (1988, p.12) state that positivists "seek cause and effect laws that are sufficiently generalisable to ensure that a knowledge of prior events enables a reasonable prediction of subsequent events" and this statement, reinforced by the researcher's engineering background, firmly puts them in the positivist paradigm. This is also reinforced when reviewing the research propositions of



this study. The researcher proposes that the cause, i.e. role model motivation, can *positively influence* students' expectancy of entrepreneurial success and desirability of entrepreneurial success, i.e. the effects.

McDonald et al. (2015) documented the data gathering methods of research published in five top entrepreneurship journals between 1985 and 2013 and concluded that entrepreneurship research is dominated by positivist approaches and data gathering methods. The common theme in entrepreneurship research is the positivist approach of making recommendations about how the future should look based on an analysis of the past i.e. seeking cause and effect laws. Following a review of the researcher's philosophy, a positivist approach will be taken as it best suits the research problem, the area of study, the researcher's own philosophical viewpoint, and the researcher's skillset. This will also lead to increased confidence in selecting the appropriate research methodology.

<b>Assumptions</b>	<b>Positivism</b>
Ontological (Nature of Reality)	There is one defined reality, fixed, measureable, and observable.
Epistemological (Knowledge)	Genuine knowledge is objective and quantifiable. The goal of science is to test and expand theory.
Axiological (Role of Values)	Objectivity is good and subjectivity is inherently misleading.
Human Nature (Environment)	We are born into a world in which there are causal laws that explain the patterns to our social behaviour.
Methodological (Research Strategies)	Using quantitative research methods such as experiments, quasi-experiments, exploratory and analytical methods, case studies and so on (which require objective measurement and analysis) is the only acceptable method to generate valid knowledge.

Table 1: Summary of positivist assumptions adapted from Burrell and Morgan (1979, pp.21-37)

### **3. Research Methodology**

Positivist research is based on validity, reliability and generalisation. According to Fawcett and Hearn (2004, p. 205) “phenomenological approaches are often associated with qualitative orientations and positivist positioning with quantitative techniques”. Hudson and Ozanne (1988) suggest that the two general research approaches, i.e. the positivist approach or the interpretive approach, differ in their assumptions about the world and their goals. They state that the positivist approach to research includes adherence to scientific protocols. The research design sets out a fixed protocol, and by adhering to this protocol, one can then accurately answer their research questions. They conclude that as positivists researchers strive toward the conviction that their descriptions correspond to true reality and their goal to reveal the true reality and predict the outcome of events.

The role of theory has a different role to play in qualitative and quantitative research (Borrego et al., 2009). In quantitative studies, theory is utilised in the initial stages of the research design, identifying hypotheses and selecting suitable measurement tools. Qualitative research differs in that theory is used as a lens to examine and interpret the findings of the research study and the theory is utilised at a much later stage. As qualitative research is generally inductive, the data is analysed without any preconceptions as to existing theory, allowing ideas or groupings to transpire from the data. At the conceptualisation stage, it was decided that this research will aim to be both incremental and practical. An approach of theory testing rather than theory building was anticipated. It is proposed that an extension of expectancy-value theories of motivation, i.e. motivation theory of role modelling will be tested.

Evered and Louis (1981) propose two distinct paradigms, inquiry from the outside and inquiry from the inside. They argue that as organisational observers we are experientially and existentially entrenched in the organisational system that we are acquiring knowledge of, i.e. tasks, people, technologies, culture, rewards, etc. In contrast, the traditional researcher is experientially committed to academia and is a temporary visitor to the subject organisation. Knowledge of a process can be gained in two ways, by gathering data from the outside and coming to an independent conclusion or by becoming involved in the process and using your own experiences and immersing yourself in order to understand what is going on.

### 3.1 The research strategy continuum

Figure 1 shows a continuum of research strategies. Experiments, quasi-experimental techniques, and surveys were reviewed to determine which research strategy best suited the research problem, keeping the researcher's positivist philosophy in mind. Experiments are at the deductive end of the continuum. A control group (that does not receive any intervention) and an experimental group (that undergoes an intervention) are required in order to countenance the effects of extraneous variables. If a difference between the two groups is noticed following an intervention, then the difference observed is a result of that intervention.

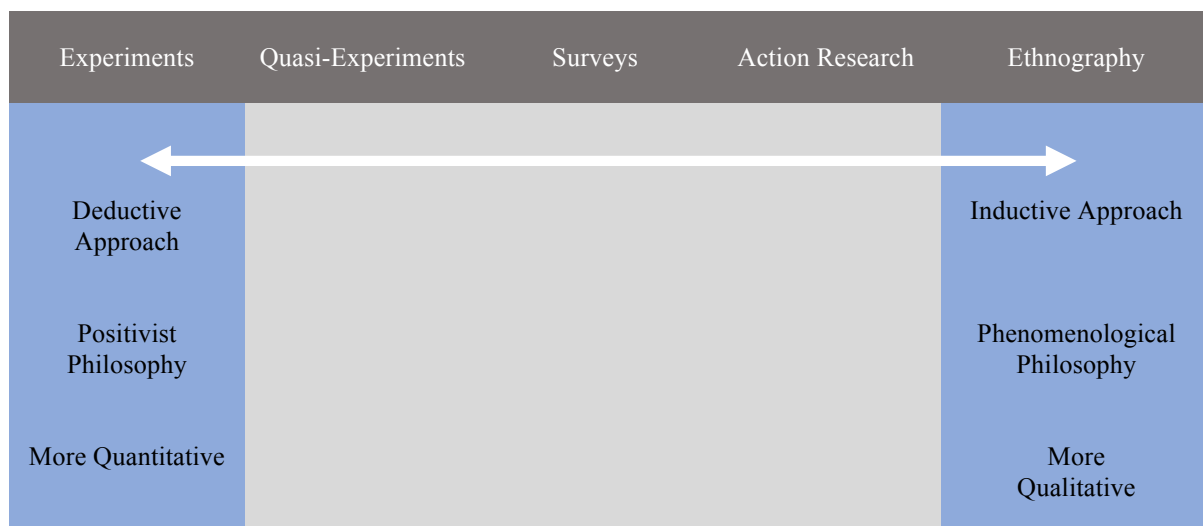


Figure 1: Continuum of research strategies adapted from Djebarni et al. (2014, p.35)

Ethnographic research strategies are at the inductive end of the continuum and have their foundations in a phenomenologically positioned paradigm. Ethnography can be literally defined as a portrait of a people (Harris, 2001). As outlined by Fetterman (2009, p.1), the ethnographic researcher “adopts a cultural lens to interpret observed behaviour, ensuring that the behaviours are placed in a culturally relevant and meaningful context”. Research is focused on the predictable daily routines of human thought and behaviour. Researchers learn through methodically observing their subjects by interviewing, observing, and reviewing documents and chronicling what they see and hear, how things are done, and then attributing meaning to actions.

Adcroft and Willis (2008) assessed approximately 4,000 articles from 23 journals to assess their philosophical foundations. They found a growing prevalence and popularity of mixed-methods as an approach to management research but they found a difficulty in evaluating their philosophical underpinning. They argue that the methodology of a research study offers a fundamental indicator as to the underlying philosophy but that this is just one of several indicators. They contend that positivist philosophies do lean to certain methodologies but they do not preclude all other methodology choices and they conclude that it is possible to be both a positivist and a mixed-method researcher.

According to Johnson and Onwuegbuzie (2004), if you visualise the research strategy continuum (Figure 1), mixed-methods cover the large set of strategies in the middle of the two extremes. Mixed-methods research is becoming more popular due to the increase in mixed-methods publications (Halcomb & Hickman, 2015) and the ability of computer-based technologies now integrating a range of new mixed-methods designs and analytical practices (Bazeley, 2009; Cope, 2014; Fielding, 2012). Johnson and Onwuegbuzie (2004) argue that researchers who conduct mixed-methods research are more inclined to select methods that relate to the underlying research questions rather than selecting a method based on preconceived biases about which research paradigm they find themselves located.

Based on the philosophical position of the researcher and considering the advantages and disadvantages of different approaches, it can be concluded that the methodology that best suits the research problem will be a mixed-methods design. This approach will allow the researcher to delve deeper into the findings to conclude convergence, strengthening the claims of the research study or alternatively helping to explain a lack of convergence.

### **3.2 Mixed-methods**

A mixed-methods study “involves the collection or analysis of both quantitative and/or qualitative data in a single study in which the data are collected concurrently or sequentially, are given a priority and involve the integration of the data at one or more stages in the process of research.” (Creswell et al., 2003, p. 212). Mixed-method studies allow the researcher to gain breadth and depth of understanding or validation, within a single study or closely related studies (Johnson & Onwuegbuzie, 2004).

Mixed-methods are sometimes referred to as the “third methodological movement” (Teddlie & Tashakkori, 2011, p.205). According to Giddings and Grant (2007), by classifying research activities into an orderly list of philosophical assumptions and characteristics, we are at risk of labelling researchers. Morgan (1998) outlines two basic explanations as to why it is difficult to combine qualitative and quantitative methods. The first difficulty arises from technical complexities in creating effective combinations of qualitative and quantitative methods. Morgan (1998) argues that the growing number of studies across a range of research fields provide substantiation of the validity of mixed-method research designs. The second difficulty comes from the complexity of using two different paradigms.

Opponents of mixed-methods argue that quantitative and qualitative paradigms should not be mixed (Giddings, 2006; Howe, 1988). Johnson and Onwuegbuzie (2004) present mixed-methods research as the third research paradigm and recommend pragmatism as a philosophy that can help to bridge the gaps between conflicting philosophies. They argue that the aim of mixed-methods research is not to substitute quantitative and qualitative research but to utilise the advantages of both and minimise the weaknesses of both, in single research studies. By gaining an understanding of the advantages and disadvantages of both qualitative and quantitative research, the researcher can then blend or combine strategies.

### **3.3 Justification for mixed-method designs**

Johnson and Onwuegbuzie (2004) conclude that this principle of combining the best attributes of both justifies mixed-methods strategies. They give the example of adding qualitative interviews to experiments as a “manipulation check” to avoid potential problems with experimental methods, for example, to detect if extraneous variables are influencing the controlled experiment. Another example given is that of supplementing a qualitative research study with a “closed-ended instrument” to methodically measure factors considered important to the relevant literature. They conclude that both examples can be improved by adding a component that surveys a randomly selected sample from the population of interest to improve generalisability. They argue that if findings are verified across different approaches then this increases confidence in the research findings.

As outlined and by Greene et al. (1989), and summarised in Table 2, there are five major reasons or justifications for conducting mixed-methods research; triangulation, complementarity, development, initiation, and expansion. The first, and the most commonly cited is triangulation. Triangulation refers to the use of more than one method to aid the researcher in finding convergence of the collected data in order to enhance the credibility of the research findings. Triangulation enhances and strengthens a research study's conclusions. Complementarity "increases the interpretability, meaningfulness, and validity of constructs and inquiry results by both capitalising on inherent method strengths and counteracting inherent biases in methods and other sources." (Greene et al., 1989, p.258). The third justification for mixed-methods research, development, refers to the development of a research project by creating a "synergistic effect" whereby the results from one method help to inform the other method (Hesse-Biber, 2010, p. 5). An example would be the use of quantitative data being statistically analysed and then used to inform the interview questions for the quantitative part of the study. Initiation refers to a situation whereby a study's findings raise contradictions that require further investigation, therefore initiating a new study. Expansion refers to "extending the breadth and range of the inquiry" (Greene et al., 1989, p. 259). Researchers can utilise findings to assist with further research using different mixed-methods. Mixed-method design strategies will be discussed to assess the strategy that best suits the research problem.

<b>Purpose</b>	<b>Rationale</b>	<b>Key theoretical sources</b>
<b>TRIANGULATION</b> seeks convergence, corroboration, correspondence of results from the different methods.	To increase the validity of constructs and inquiry results by counteracting or maximising the heterogeneity of irrelevant sources of variance attributable especially to inherent method bias but also to inquirer bias, bias of substantive theory, biases of inquiry context.	Campbell & Fiske, 1959 Cook, 1985 Denzin, 1978 Shotland & Mark, 1987 Webb et al., 1966
<b>COMPLEMENTARITY</b> seeks elaboration, enhancement, illustration, clarification of the results from one method with the results from the other method.	To increase the interpretability, meaningfulness, and validity of constructs and inquiry results by both capitalising on inherent method strengths and counteracting inherent biases in methods and other sources.	Greene, 1987 Greene & McClintock, 1985 Shotland & Mark, 1987 Rossman & Wilson, 1985
<b>DEVELOPMENT</b> seeks to use the results from one method to help develop or inform the other method, where development is broadly construed to include sampling and implementation, as well as measurement decisions.	To increase the validity of constructs and inquiry results by capitalizing on inherent method strengths.	Madey, 1982 Sieber, 1973
<b>INITIATION</b> seeks the discovery of paradox and contradiction, new perspectives of frameworks, the recasting of questions or results from one method with questions or results from the other method.	To increase the breadth and depth of inquiry results and interpretations by analysing them from the different perspectives of different methods and paradigms.	Kidder & Fine, 1987 Rossman & Wilson, 1985
<b>EXPANSION</b> seeks to extend the breadth and range of inquiry by using different methods for different inquiry components.	To increase the scope of inquiry by selecting the methods most appropriate for multiple inquiry components.	Madey, 1982 Shotland & Mark, 1987 Sieber, 1973

Table 2: Purposes for mixed-method evaluation designs: Sourced Greene et al. (1989, p.259)

### 3.4 Mixed method design strategies

The many alternatives of mixed-method research designs can become confusing to the researcher when trying to determine which design to use for a study. To finalise a design the researcher must first examine the design's primary assumptions (Morgan, 1998). Morgan outlines two core assumptions: designs vary in terms of the order of collecting qualitative and quantitative data and in terms of the weighting given to each.

Based on these assumptions, Johnson and Onwuegbuzie (2004) provide nine mixed-method designs as summarised in Figure 2. When forming a mixed-method design the researcher must first decide if they want to function in one primary paradigm, and secondly if they want to carry out the phases concurrently or sequentially. Mixed-method designs could be compared to carrying out two mini-studies, a quantitative study and a qualitative study, in one larger research study. In order for research design to be considered mixed-methods, the findings must be integrated at some time. Researchers are not limited to these nine combinations and can modify combinations to best suit the research questions. More stages can be added for example a sequential sequence of quantitative and quantitative research with varying weightings given to each. Combinations may also change as the research is undertaken and the researcher believes that adding an element will strengthen the research findings. Initial investigation of mixed-methods research indicates a preference for quantitative approaches to mixed-methods.

		<b>Time Order Decision</b>	
		Concurrent	Sequential
<b>Paradigm Emphasis Decision</b>	Equal Status	QUAL + QUAN	QUAL » QUAN  QUAN » QUAL
	Dominant Status	QUAL + quan  QUAN + qual	QUAL » quan qual » QUAN  QUAN » qual quan » QUAL

*Note: "qual" stands for qualitative, "quan" stands for quantitative, "+" stands for concurrent, "»" stands for sequential, capital letters denote high priority or weight, and lower case letters denote lower priority or weight.*

Figure 2: Mixed-method design matrix with mixed-method research designs shown in the four cells. Sourced from Johnson and Onwuegbuzie (2004, p.22)



### 3.5 Triangulation design

According to Creswell et al. (2003), triangulation is the most widely used mixed-method design. The aim of triangulation mixed-method design is to “obtain different but complementary data on the same topic” (Morse, 1991, p. 122). The design typically utilises separate quantitative and qualitative methods in order to compensate for the weaknesses inherent in one method with the strengths in the other method. Ideally, equal weighting is given to both collection mechanisms but practically the priority may be given to either the quantitative or qualitative approach. Normally, the results are integrated at the interpretation phase as seen in Figure 3, as proposed by Creswell et al. (2003). This interpretation may conclude the convergence of findings, strengthening the claims of the research study or alternatively may explain a lack of convergence.

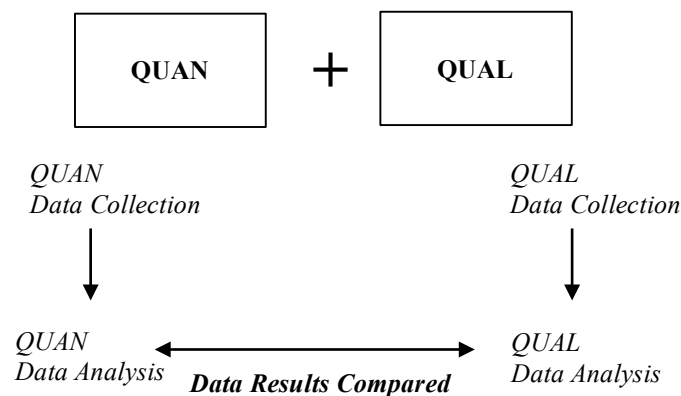


Figure 3: Concurrent Triangulation Design. Sourced: Creswell et al. (2003, p.226).

Proponents of triangulation design argue that the major advantage in its use is its familiarity with researchers and its potential to offer validated and substantiated findings (Creswell et al., 2003; Fielding, 2012). Opponents contend that the difficulties that arise when results fail to converge can outweigh the benefits of its use (Chesla, 1992; Morgan, 1998). They argue that the method entails great effort and expertise to sufficiently study a phenomenon with two distinct methods. Comparison of the results in two different formats and the ability to resolve inconsistencies when they occur can also add to the complexity.

Triangulation mixed-method strategies “increase the validity of constructs and inquiry results by counteracting or maximising the heterogeneity of irrelevant sources of variance attributable especially to inherent method bias but also to inquirer bias, bias of substantive theory, biases of inquiry context” (Greene et al., 1989, p.259). Triangulation mixed-method strategies will offer the researcher many advantages when framing the research study and this will be the primary rationale for selecting this methodology.

#### **4. Framing the research study**

The main aim of the study is to examine a link between role model influence and entrepreneurial intent. According to the GEM 2016 survey of entrepreneurship in Ireland, entrepreneurial activity is at its lowest amongst those aged between 18 and 24 (9%) (O’Gorman & Fitzsimons, 2017). Ireland has an abundance of successful entrepreneurs. To what extent can role models influence entrepreneurial intent?

It is proposed that this research study will test the motivation theory of role modelling, investigating the influence of role models on entrepreneurial intent. Morgenroth et al. (2015) examine how role models are a method of motivation. Their research is an extension of the expectancy-value theoretical framework, and they propose a new theoretical framework, the motivational theory of role modelling which emphasises how the power of role models can be utilised to increase role aspirants’ motivation, reinforce their existing goals, and facilitate them adopting new goals. Their research has been cited in numerous studies including the lack of visibility of female gamers due to a lack of role models (Paaßen et al., 2017), teachers’ influence on personal meaning, future intention, and active engagement of their students (Moran, 2016), and successful ageing role models (Jopp et al., 2016) but evidence of successful testing of the model in current literature is scarce.

The researcher must compromise between two choices; a large-scale study or a small-scale study. A large-scale study would offer greater generalisability and would align with the positivistic philosophical viewpoint of the researcher. Extraneous variables would be identified and measured and controls would be put in place. If conducting a large-scale nationwide study of those aged between 18 and 24 years old, a student survey would potentially offer a large

sample population. The result of a study in Ireland found that the role of the education system in influencing entrepreneurship is strong (Fleming, 1994) but varying levels of educational quality across different institutes will affect the validity of such a study. Besterfield-Sacre et al. (2016) established that the perception amongst entrepreneurial instructors was that the skills necessary to be an entrepreneur are mostly developed or learned so the level of entrepreneurial education may affect entrepreneurial intent and again varying levels of entrepreneurial education across different institutes will affect the validity of a large-scale study. A small-scale study minimises the number of extraneous variables. For example, studying 100 students from one educational institution would offer greater control of extraneous variables than studying 10 students from 10 educational institutions with differing degrees of entrepreneurial education and educational quality.

The issue of low entrepreneurial activity is evident in the researcher's professional environment, a third level Irish educational institute, Cork Institute of Technology (CIT). In 2016 students from this institute won all five major awards at the National Finals of the Enterprise Ireland Student Entrepreneur Awards, the "Accenture Leaders of Tomorrow National Award, 2016" and the James Dyson Ireland Award 2016, but no students decided to take up entrepreneurship as a career path. This has been further exaggerated as the economy improves and more jobs become available. There is an observed lack of entrepreneurial intent and there is now a community-wide desire to increase entrepreneurial intent. It is proposed that the units of observation for this research will be students in a third level Irish educational institute. This will provide access to subjects in the 18 to 24-year-old age bracket and will allow extraneous variables to be minimised, interpreted, and controlled.

Based on the advantages and disadvantages of both choices a small-scale study will be chosen. The researcher has direct access to students and data and is actively involved in entrepreneurial activity in CIT. The researcher is a member of the ACE consortium (Accelerating Campus Entrepreneurship) in CIT. The consortium aims to offer an integrated student-centred approach to improving student entrepreneurial activity. The ACE group comprises of representatives of academic departments across the institute, the Hincks Centre for Entrepreneurship Excellence, the Innovation and Enterprise office, the Rubicon Incubation Centre, student's union and student enterprise interns. A smaller scale study will introduce sample selection bias. As sample size decreases, sample selection bias increases (Nemes et al., 2009) and the primary concern for the researcher is that the sample is not representative and therefore the results may

not be generalisable. If the researcher is aware of these specific issues they can interpret their effects more carefully.

Triangulation mixed-method design allows the researcher to collect different but complementary data. A review of the current literature indicates the popularity and credibility of this methodology. The results are integrated at the interpretation phase. This interpretation may conclude the convergence of findings, strengthening the claims of the research study or alternatively may explain a lack of convergence (Creswell et al., 2003). The research methodology should best suit the research questions. Analysing the propositions outlined, it can be concluded that they may be answered using quantitative methods or qualitative methods, but a mixed-methods approach can aid as a “manipulation check” to detect if extraneous variables are influencing the controlled experiment and also to interpret the effects of sample selection bias more carefully.

### **5. Small Scale Mixed-Methods Triangulation study**

Based on the philosophical position of the researcher and considering the advantages and disadvantages of different approaches, it can be concluded that the methodology that best suits the research problem will be a small-scale mixed-methods triangulation design. This mixed-method approach will allow the researcher to delve deeper into the findings to conclude convergence, strengthening the claims of the research study or alternatively help to explain a lack of convergence.

A small-scale study will allow extraneous variables to be identified, minimised, and controlled. A mixed-method design can aid as a “manipulation check” to detect if extraneous variables are influencing the research study. It is proposed that the units of observation will be engineering students undertaking the fourth year of a four-year honours degree or a five-year master in Mechanical & Biomedical Engineering in a third level Irish educational institute. This will provide access to subjects in the 18 to 24-year-old age bracket. The researcher will have access to approximately 100 students. By selecting a cohort of similar students, extraneous variables can be minimised as they will undergo the same education and will be at a similar stage on their educational journey.

Figure 4 outlines the proposed mixed-method design. The process will consist of four phases; the conceptualisation phase, the investigation phase, the role model intervention, and the evaluation of results phase. As outlined by Audretsch (2004), entrepreneurial activity is a key

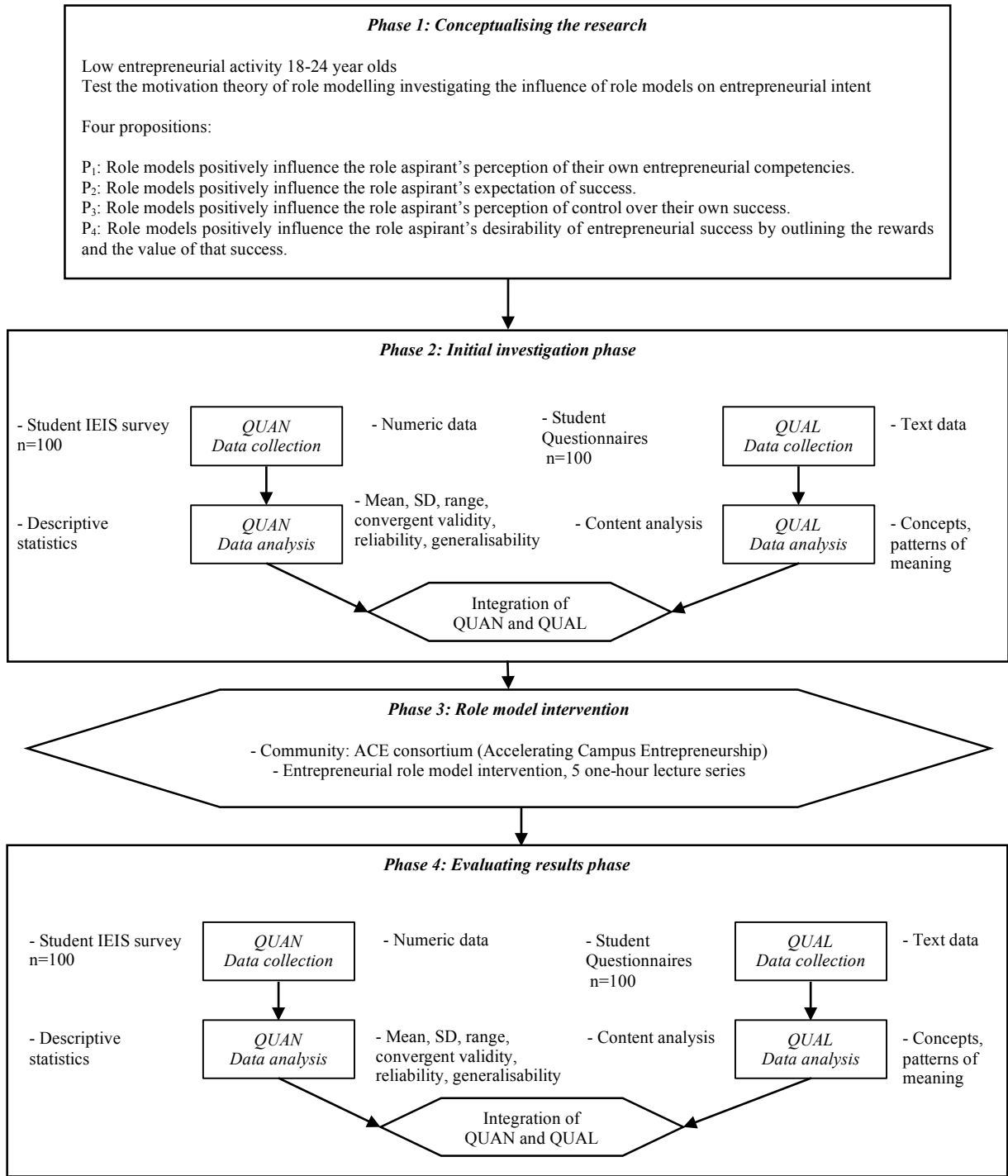


Figure 4: Proposed 4 phase mixed-method design (source: current research)

driver of economic growth. Countries with a higher occurrence of opportunity driven entrepreneurship tend to have a higher prevalence of high-job-growth (Hessels et al., 2008). This has led to an increased focus on entrepreneurship due to the potential for economic growth and job creation. According to the GEM 2016 survey, entrepreneurial activity in Ireland is at its lowest amongst those aged between 18 and 24 (9%). Following a literature review, the study was conceptualised and a general study plan was developed. The review of the literature focused on identifying the problem of low entrepreneurial activity and proposing the utilisation of role models as a means of influencing entrepreneurial intent. It is proposed that this research study will test the motivation theory of role modelling investigating the influence of role models on entrepreneurial intent. Morgenroth et al. (2015) examine how role models are a method of motivation. As part of the conceptual phase of this research study the following propositions are offered;

P<sub>1</sub>: Role models positively influence the role aspirant's perception of their own entrepreneurial competencies.

P<sub>2</sub>: Role models positively influence the role aspirant's expectation of success.

P<sub>3</sub>: Role models positively influence the role aspirant's perception of control over their own success.

P<sub>4</sub>: Role models positively influence the role aspirant's desirability of entrepreneurial success by outlining the rewards and the value of that success.

The investigation phase will involve a quantitative survey and a qualitative open-ended questionnaire to identify the initial entrepreneurial intent of the students. Thompson's (2009) IEIS (Individual Entrepreneurial Intent Scale) will be used. The IEIS will offer a baseline of entrepreneurial intent at the beginning of the research study. By measuring the entrepreneurial intent of students at the investigation phase and again at the evaluating results phase, inferences can be made as to the effect of the role model intervention. Concurrently, qualitative data will be collected using an open-ended questionnaire. The initial qualitative questionnaire will assess students' existing entrepreneurship goals, what are their perceived benefits of entrepreneurship, how they value entrepreneurial success, and what is their perception of attainability of that success. Based on an initial pilot study, questions and guidelines for completion will be developed. "Canvas", the educational learning platform, will be used to collect both the quantitative survey data and the qualitative questionnaire data. Both will be incorporated into one data collection instrument and students will complete both at the same

time. Students have access to the software and use it on a regular basis. This will also allow students to be anonymised but at the same time link the pre-intervention questionnaire to the post-intervention questionnaire.

The role model intervention stage will include a series of five one-hour informative lectures from entrepreneurial role models. Role models will be identified with the help of the ACE consortium in CIT. It is predicted that the role models will have three distinct functions: acting as behavioural models, representing the possible, and being inspirational. The aim of these lecture series will be to show students, i.e. role aspirants, what is possible. Role models will reinforce students' existing goals (identified in the investigation phase) and facilitate them in adopting new ones. They will aim to increase the desirability of entrepreneurial success by showing that success is achievable and the value of that success. As inspirations, it is envisaged that they will contribute to the acquisition of new goals, i.e. not only will they make something desirable seem more achievable, they will also make something new desirable in the first place.

The evaluation of results phase will involve measuring entrepreneurial intent using the quantitative survey and an open-ended qualitative questionnaire. Any increases in the entrepreneurial intention of students can be analysed using the qualitative data. The evaluation qualitative questionnaire will also assess students' new perceived benefits of entrepreneurship and if they value the benefits of entrepreneurial success differently. The questionnaire will also identify if they have adopted new goals as part of the role model lecture series. Also, an attempt will be made to gauge the admiration and internalisation of the role model qualities and to identify what role models they admired most and how they internalised that role model's qualities. An increase in intent for all students is expected due to ongoing entrepreneurial education over the period of the research study and the qualitative data will also assist the researcher to identify if this affects intent. On completion of the evaluating action phase recommendations will be made as to the influence of role models on entrepreneurial intent and how entrepreneurial role models can be best used to influence entrepreneurial intent for further iterations of the mixed-methods process.

## **6. Thompson's IEIS (Individual Entrepreneurial Intent Scale)**

It is proposed that Thompson's (2009) IEIS scale will be used to measure entrepreneurial intent at the investigation and evaluation of results phases. Thompson developed the scale due to a consensus amongst management academics that the lack of a construct to measure entrepreneurial intent was impeding further entrepreneurship research. The GEM survey categorises nascent entrepreneurs as those actively involved in setting up a new business. Those possessing entrepreneurial intent do not need to be actively involved in setting up a business but plan to do so in the future. According to Thompson (2009), the critical point is to determine when does someone with entrepreneurial intent become a nascent entrepreneur? As outlined by Reynolds and Miller (1992), the sequencing of starting a new business can follow many different patterns and typically it is difficult to predict the exact sequence. The consensus in the current literature is that the only certain stages in business start-ups are the first stage and the last stage (Bhave, 1994; Carter et al., 1996; Reynolds & Miller, 1992). The first stage involves the formation in the mind of an individual that they might intend to start a business in the future. The last stage, when they formally set up a new business and become a nascent entrepreneur. Based on this discussion, Thompson (2009, p. 676) defines entrepreneurial intent as "a self-acknowledged conviction by a person that they intend to set up a new business venture and consciously plan to do so at some point in the future". The point in time may happen in the near future or it may never be reached. Entrepreneurial intent is a necessary condition for an individual to become a nascent entrepreneur but it is not an inevitable outcome that those with entrepreneurial intent will become a nascent entrepreneur.

The IEIS represents a significant improvement over previous operationalisations of entrepreneurial intent with greater construct validity (Valliere, 2015). Thompson's scale is the most widely applied particularly in the area of the role of education on entrepreneurial intent (Küttim et al., 2014; Liñán et al., 2011; Lorz & Volery, 2011; Vanevenhoven & Liguori, 2013), which aligns closely with this proposed study. The IEIS will offer a baseline of entrepreneurial intent at the beginning of the research study.

The scale features ten items that are a combination of direct measures of intention and measures of behaviours that strongly imply intentions. The scale consists of six substantive and four distracter items. Table 3 outlines the questionnaire items for Thompson's IEIS. Items appear as a single block in the order given. Items marked with an asterisk are distracter items that act



as diversions. These distractors will not be included in scale analyses. From testing the scale, Thompson (2009, p. 687) concluded that the IEIS was shown to “incorporate high content validity, plus broad applicability across populations by nationality, age, and occupation”. Furthermore, the items selected “help maximise general applicability to most individuals with entrepreneurial intent regardless of the stage of which they might have advanced regarding setting up a firm”.

### **Individual Entrepreneurial Intent Scale**

Question: Thinking of yourself, how true or untrue is it that you:

Items:

- 1: Intend to set up a company in the future
- 2: Plan your future carefully\*
- 3: Read business newspapers\*
- 4: Never search for business start-up opportunities (R)
- 5: Read financial planning books\*
- 6: Are saving money to start a business
- 7: Do not read books on how to set up a firm (R)
- 8: Plan your finances carefully\*
- 9: Have no plans to launch your own business (R)
- 10: Spend time learning about starting a firm

\* Distracter items, not to be included in scale analyses.  
 - Items marked (R) are reverse coded in scale analyses.  
 - Interval measure runs 1 = very untrue, 2 = untrue, 3 = slightly untrue, 4 = slightly true, 5 = true, 6 = very true.

Table 3: IEIS survey questions. Sourced: Thompson (2009, p.680)

## **7. Operationalising the research study**

It is proposed that students will complete an open-ended qualitative questionnaire prior to the role model intervention and after the intervention. The initial qualitative questionnaire will assess the students' initial attitudes toward entrepreneurship. The questionnaire will also assess students' existing entrepreneurship goals and what are their perceived benefits of entrepreneurship and how they value entrepreneurial success. The evaluation qualitative questionnaire will look at the attitudes to entrepreneurship after the role model intervention whilst also assessing students' new perceived benefits of entrepreneurship and if they value the benefits of entrepreneurial success differently. The questionnaire will also identify if they have adopted new goals as part of the role model lecture series. Also, an attempt will be made to gauge the admiration and internalisation of the role model qualities and to identify what role models they admired most and how they internalised that role model's qualities. On completion of the evaluating results phase recommendations will be made as to the influence of role models on entrepreneurial intent and how entrepreneurial role models can be best used to influence entrepreneurial intent.

A pilot study will be conducted in order to gauge the questions that the initial qualitative questionnaire should include. Semi-structured interviews will be held with two students in the third year of their four-year degree programme. Interviews have proven to be "the gold standard" of qualitative research (McCoyd & Kerson, 2006, p. 400). Semi-structured interviews are often linked with qualitative research. They are defined as "an interview with the purpose of obtaining descriptions of the life world of the interviewee in order to interpret the meaning of the described phenomena." (Kvale & Brinkmann, 2009, p. 3). Semi-structured interviews allow much more leeway between the interviewer and interviewee.

The students will be chosen from year three of a four-year honours degree or a five-year master in Mechanical & Biomedical Engineering in CIT. As part of these programmes, on average 100 students annually undertake two modules known as "Innovative Product Development (IPD) Laboratories" in their third year. The module "teaches entrepreneurial skills". The entrepreneurial skills of these students are benchmarked both nationally and internationally through student innovation competitions, winning national and international competitions. The students chosen will be at the initial stages of the IPD module and will have undertaken idea-generation workshops. Both will be at the same stage on their education path.

Based on the recurring themes in the literature and linked to the research question, a pre-data collection “Mind Map” was generated (Figure 5).

*Can role models increase the desirability of entrepreneurial success of students, through admiration and internalisation of role model qualities?*

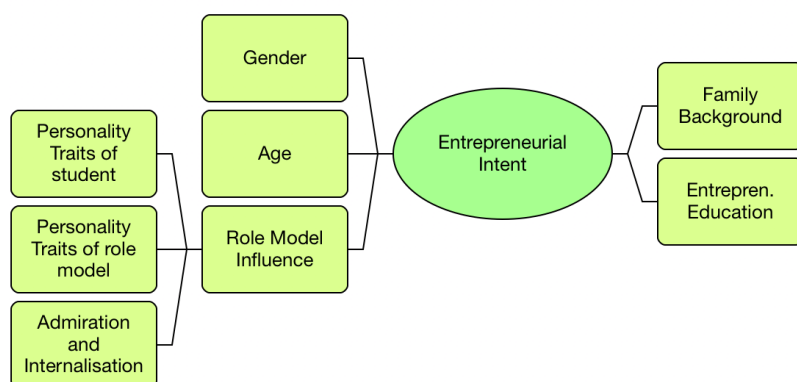


Figure 5: Pre-data collection “Mind Map” (source: current research)

Recurring themes in the literature influencing entrepreneurial intent include; gender, age, family background, entrepreneurial education, and role model influence. Starting a business is positively correlated with having parents who are or were entrepreneurs (Chlosta et al., 2012; Hoffmann et al., 2015). They conclude that growing up in an entrepreneurial family offers the opportunity to learn from the self-employed parent serving as a role model and getting a real job perspective of self-employment. Lüthje and Franke (2003) conclude that personality traits and entrepreneurial attitude are strongly linked with the intention to start a new venture. Positive personality traits include; achievement motivation, locus of control, risk propensity, innovativeness, and proactivity, or proactive personality (Brandstätter, 2011; Fairlie & Holleran, 2012; Leutner et al., 2014; Verheul et al., 2012; Yan, 2010).

Personal identification, internalisation, and admiration play an important factor on the effect of role model motivation (Morgenroth et al., 2015). By analysing the entrepreneurial personality traits of students and comparing it to their perceived personality traits of the role models, inferences can be made in relation to internalisation, and admiration of the role model qualities. Entrepreneurship education contributes to an increase in entrepreneurial intentions

(Fayolle, 2013; Fleming, 1994; Matlay, 2006; Støren, 2014). Based on the generated “mind map” in Figure 5, a list of questions for the pilot interviews was generated. Table 4 outlines the preliminary interview questions.

### **Preliminary Interview Questions**

Items:

1: Do you have any family that you would consider to be entrepreneurs?

2: What is your attitude towards entrepreneurship and can you see yourself starting a business in the future? If so when?

3: Has your attitude changed from completing IPD in CIT?

4: What would you say are the barriers to starting a business for you and do you think you could overcome those barriers?

5: Do you think if you started a business that it would be a success?

6: What would you say would be the rewards of being an entrepreneur and how would you value those rewards?

7: What personal attributes would you say you have that would make you a successful entrepreneur? Would you consider yourself a risk taker? Any examples?

8: Have you met any entrepreneurial role models and what attributes in them could you relate to?

9: Did they influence your intent to become an entrepreneur in any way?

Table 4: Preliminary student interview questions (source: current research)

On completion of the semi-structured interviews the qualitative data analysis (QDA) will be analysed. The QDA will involve coding the data and identifying recurring themes. The results will then inform the questions for the initial investigation open-ended qualitative questionnaire along with guidelines for completion of the questionnaire.

Figure 6 outlines the proposed timeline for the pilot study, the investigation data collection, the role model intervention, and the evaluation data collection. Data will be collected during the first semester. It is proposed that this will be an iterative process whereby if a role model influence on entrepreneurial intent is identified, then the lecture series will be repeated each year.

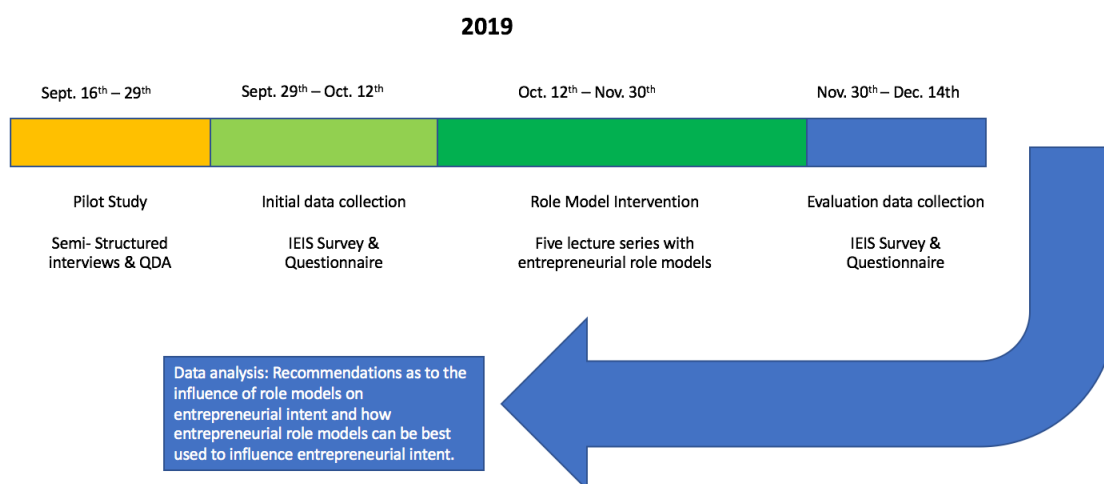


Figure 6: Proposed timeline of the data collection phases (source: current research)

## 8. Ethical considerations

Ethical concerns must be considered from the initial investigation to the final concluding of results (Kvale & Brinkmann, 2007). What are the beneficial consequences of this study? Role models can increase the desirability of entrepreneurial success of students by showing them that that success is attainable and showing them the value of that success. This will in turn increase students' career prospects by opening new opportunities. An increase in entrepreneurial activity will benefit society as it is a key driver of economic growth (Audretsch, 2004; Hessels et al., 2008).

The units of observation for this study will be students from the researcher's own educational institute. The pilot study will entail two semi-structured interviews. There is the potential that subjects may feel under pressure to participate so it is important that they are reassured that they are under no obligation. Informed consent requires that the interviewees are informed of

the overall purpose of the research and the possible risks and benefits from partaking in the interviews. Voluntary participation will be sought and interviewees will have the option to withdraw at any time. As outlined by Kvale and Brinkmann (2007), interviewees should be informed about the purpose and the procedure of the interview. This will include information about the researcher's right to publish the whole interview or parts of it; about confidentiality and who will have access to the interview; and the interviewee's possible access to the transcription and the analyses of the interviews. Private data identifying the subjects will not be reported. All participants will be anonymised.

Following the pilot study, a qualitative survey and a qualitative questionnaire will be sought prior to the role model intervention and following the intervention. The role model lecture series will be incorporated into an engineering management module. As part of the indicative content of this module students research business environments, innovation and entrepreneurship. Attendance at the lecture series and completion of the surveys will be mandatory as this will provide a learning opportunity for the students aligned with the learning outcomes of this module. Private data identifying the subjects will not be reported. All participants will be anonymised. A unique identifier will allow the pre-intervention data to be compared with the post-intervention data for each student, allowing an extra level of analysis.

## **9. Conclusion and next steps**

This paper justifies a research methodology for examining to what extent can role models influence entrepreneurial intent. Based on the philosophical position of the researcher and considering the advantages and disadvantages of different approaches, the methodology that best matches the research problem is a mixed-methods triangulation design. Mixed-methods will be incorporated at the investigation and evaluation of results phases. The units of observation will be engineering students undertaking the fourth year of a four-year honours degree or a five-year master in Mechanical & Biomedical Engineering in a third level Irish educational institute. This will provide access to subjects in the 18 to 24-year-old age bracket. The researcher will have access to approximately 100 students.

The IEIS will measure the initial intent of students. Concurrently qualitative questionnaires will be completed and recurring themes identified and coded. The role model intervention stage will include a series of five one-hour informative lectures from entrepreneurial role models. It is predicted that the role models will have three distinct functions: acting as behavioural models, representing the possible, and being inspirational. The evaluation of results phase will involve measuring entrepreneurial intent and a qualitative questionnaire. Any increases in the entrepreneurial intention of students can be analysed using the qualitative data. Recurring themes will again be identified and coded. The mixed-method approach will help to identify convergence in the findings, or alternatively identify why the findings do not converge. On completion of the evaluating action phase recommendations will be made as to the influence of role models on entrepreneurial intent and how entrepreneurial role models can be best used to influence entrepreneurial intent for further iterations of the mixed-methods process.

The next stage of this research study will discuss the results of the pilot study and the preparation for quantitative and qualitative data collection. The design of the data collection instruments at the investigation and evaluation of results phases will be presented. The aim of the design will be to optimise the validity and reliability of the research study. Ethical implications of the research will be addressed and initial findings discussed.

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### **Preface to paper 3 – Research design and initial findings**

The ‘Design & Initial Findings’ paper (Paper 3) was developed between May 2019 and October 2019. The paper was then presented on 10<sup>th</sup> October 2019 with some revisions to the final paper which are documented below. The final recommended version of the paper included in this thesis was submitted following amendments based upon examiner commentary. Ethical approval was sought from WIT, the institute supervising the research study, and CIT, the institute where the research study was implemented. The researcher received ethical clearance from the WIT School of Business Ethics Committee and the CIT Research Ethics Committee in September 2019. Private data identifying the subjects would not be reported. All participants would be anonymised. The role model lecture series was incorporated into an Engineering Management module which took place in the first semester of the academic year. As part of the indicative content of this module, students covered topics such as business environments, innovation, and entrepreneurship. Students were required to attend at least four out of the five lectures and complete a reflection assignment following the talks. Consent forms were developed to clearly state that participation in the research study was voluntary and to give clear information on the study and how data would be collected and stored.

The ‘Methodology’ paper (Paper 2), suggested using “Canvas” to collect the data for this study but on further investigation Survey Monkey was deemed to offer better analytics and tracking of participation. Table 1 summarises the pilot study operationalisation and the resulting changes to the main study. The sample students used for the pilot study were in the third year of a four-year Honours degree or a five-year Masters degree in Mechanical Engineering and Biomedical Engineering. Ninety-five students completed the first pilot questionnaire to test Thompson’s IEIS and the investigation phase (Phase 2) qualitative survey.

At this stage in the study, the researcher decided to add a further quantitative element to the evaluating results phase (Phase 4) of the study. Thompson’s (2009) IEIS would be used to quantify any change in entrepreneurial intent but would not give any information on why there was a change, if one was observed. Therefore, it was believed that adding an additional quantitative data collection instrument would help to strengthen the findings of this research and help to understand “how” role models can be used to motivate students to consider



entrepreneurship as a career. A set of hypotheses were developed based on the original propositions of the study.

<b>Data collection instrument tested</b>	<b>Phase where instrument was used</b>	<b>No. of resp.</b>	<b>Outcome</b>
Thompson's (2009) Quantitative IEIS	Phase 2: Investigation & Phase 4: Evaluation	95	Scale showed acceptable validity and reliability. Scale moved to front of questionnaire.
Pre-talks open-ended qualitative survey	Phase 2: Investigation	95	Modified to include closed-ended questions where open-ended answers were lacking in detail. Clarification added on role models in students' network.
Post-talk researcher developed quantitative questionnaire to give a measure of role model motivation	Phase 4: Evaluation	35	Scale items reduced from six to four. Two variables removed.

Table 1: Summary of the pilot study operationalisation

These hypotheses were used to develop questions that would give a measure of the role model motivation resulting from the talks. Following the completion of the 'Design & Initial Findings' paper (Paper 3) and prior to commencing the 'Findings & Discussion' paper (Paper 4), it was suggested, by the examiners, that this researcher developed quantitative questionnaire would benefit from a pilot test, if time allowed. The questionnaire was then sent to the same sample of third-year students and was completed by 35 respondents. A factor analysis was performed on the data. Factor Analysis is a technique to replace the large number of variables into a fewer number of factors by looking at their covariance structure (Mukherjee et al., 2018, p.103). The 'Design & Initial Findings' paper (Paper 3) proposed five variables influencing entrepreneurial intent. Following a factor analysis, these five variables were reduced to three. This is discussed in more detail in the 'Findings & Discussion' Paper (Paper 4) and the preface to the paper.

Originally the research design process presented in the 'Methodology' paper (Paper 2) proposed that an open-ended survey would be used to collect qualitative data at the evaluation of results phase (Phase 4). As the researcher embraced reflection as part of the DBA and gained a greater understanding of its effectiveness as a learning tool, it was decided to use student

reflection to collect qualitative data following the lectures. Due to time restrictions imposed by the academic year, it was agreed with the DBA supervisors and examiners for paper 3 that the reflection qualitative instrument did not need to be piloted, as this is a well-proven method of learning. In order to provide further clarification to the reader, Table 2 provides a summary of the final data collection instruments used following the pilot study.

<b>Data collection instrument used</b>	<b>Phase where instrument was used</b>	<b>Purpose</b>
Thompson's (2009) IEIS (Quantitative)	Phase 2: Investigation	To measure entrepreneurial intent of students before the role model lectures.
Pre-talks survey (Qualitative)	Phase 2: Investigation	To gather information on students' attitudes to entrepreneurship and the role models in their network.
Thompson's (2009) IEIS (Quantitative)	Phase 4: Evaluation	To measure entrepreneurial intent of students after the role model lectures.
Post-talk researcher developed questionnaire (Quantitative)	Phase 4: Evaluation	To give a measure of the influence that the role model lectures had on the entrepreneurial intent of the students.
Student Reflections (Qualitative)	Phase 4: Evaluation	To gather information on the students' reflections following the role model lectures.

Table 2: Summary of the final data collection instruments used in the study

The 'Methodology' paper (Paper 2) presented the research question;

*Can role models increase the desirability of entrepreneurial success of students, through admiration and internalisation of role model qualities and increase students' perceived attainability of success by seeing what is achievable?*

As posited by the examiners, a lot of action is denoted and the research question may be too broad, taking the researcher through many different threads of literature. It was suggested to modify the research question to align more closely to what was being proposed. The research question was modified as follows;

*Can role models increase students' entrepreneurial intent by increasing confidence in their entrepreneurial competencies and by highlighting the rewards of entrepreneurial success?*

Other minor modifications requested by the examiners included a request to add a diagrammatical representation of the mixed-methods process as presented in the previous paper. Language in terms of quantitative and qualitative research was re-examined for appropriateness. The ‘Design & initial findings’ (Paper 3) will now follow and this preface should give the reader more clarity as to the changes made to the research design and the reasons for those changes.

**References:**

Mukherjee S.P., Sinha B.K., Chattopadhyay A., 2018. Factor Analysis. *Statistical Methods in Social Science Research*. Springer, Singapore, pp.103-111.

Thompson, E.R., 2009. Individual entrepreneurial intent: Construct clarification and development of an internationally reliable metric. *Entrepreneurship Theory and Practice*, 33(3), pp.669-694.

**Paper 3:**  
**Design & initial**  
**findings**

**Examination date:**  
**10/10/2019**

Participant Name: Paul Keane 20077332

Supervisors: Dr. Cormac O' Keeffe and Prof. Bill O' Gorman

Date: 02/10/19

**RESEARCH PAPER SERIES**

**Paper 3:**

**DESIGN/ INITIAL FINDINGS**

**“A framework for the utilisation of role modelling intervention for the promotion of entrepreneurship as an alternative career path.”**

## **ABSTRACT**

This paper discusses the operationalising of a mixed-method research design utilised to examine a link between role model influence and entrepreneurial intent. This research is undertaken as part of a larger doctoral research study by applying mixed-method research in the researcher's own organisation. The research examines how entrepreneurial role models can be used to motivate students to consider entrepreneurship as a career. The units of observation for this research study are students in a third-level Irish educational institute.

An initial questionnaire was developed and tested in a pilot study of 95 students. The pilot study showed a strong correlation to common themes in entrepreneurship research. Personality traits such as achievement motivation, locus of control, risk propensity, and innovativeness were evident in those showing a strong entrepreneurial intent. Entrepreneurial intent was measured using Thompson's (2009) individual entrepreneurial intent scale (IEIS) and the scale was found to have acceptable internal reliability. The students' entrepreneurial intent was compared with an international sample of students and was found to be similar. The underlying theory, the motivational theory of role modelling, was re-examined based on the findings of the pilot study and the mixed-method research design was developed. The timeline of the research study is outlined and the application of the proposed methods discussed.

**Paper Word Count:** 8,707

## 1. Introduction and plan of the paper

The mixed-method research design, diagrammatically represented in Figure 1, incorporates four phases; conceptualising the research, an initial investigation, an intervention i.e. an entrepreneurial role model lecture series, and an evaluation of results phase. The conceptualisation of this study is discussed in the first paper of this research series. It is proposed that this research study will test the motivation theory of role modelling, investigating the influence of role models on entrepreneurial intent as proposed by Morgenroth et al. (2015). The theory is an extension of the expectancy-value theoretical framework, and they propose a new theoretical framework, the motivational theory of role modelling, which emphasises how the power of role models can be utilised to increase role aspirants' motivation, reinforce their existing goals, and facilitate them adopting new goals. Empirical studies loosely suggest a positive influence of role models on the decision to become an entrepreneur but a link between role model influence and entrepreneurial intent is inconclusive leading to the research question:

*Can role models increase students' entrepreneurial intent by increasing confidence in their entrepreneurial competencies and by highlighting the rewards of entrepreneurial success?*

The aim of the investigation phase will be to measure the baseline entrepreneurial intent and analyse baseline entrepreneurial attitudes, perceived barriers to entrepreneurship, value of entrepreneurial success, and the entrepreneurial influence of role models within their network. A mixed-method questionnaire will be utilised. The results of the investigation phase will then inform the role model intervention. The intervention stage will incorporate five entrepreneurial role model lectures. Role models will be chosen from various stages of new business start-ups. The evaluation phase will comprise of two parts. First, a quantitative questionnaire will test the hypotheses outlined based on the motivational theory of role modelling (Morgenroth et al., 2015) and will again measure students' entrepreneurial intent. Second, a qualitative data analysis will focus on the propositions outlined and the effect of exposure to the entrepreneurial role models.



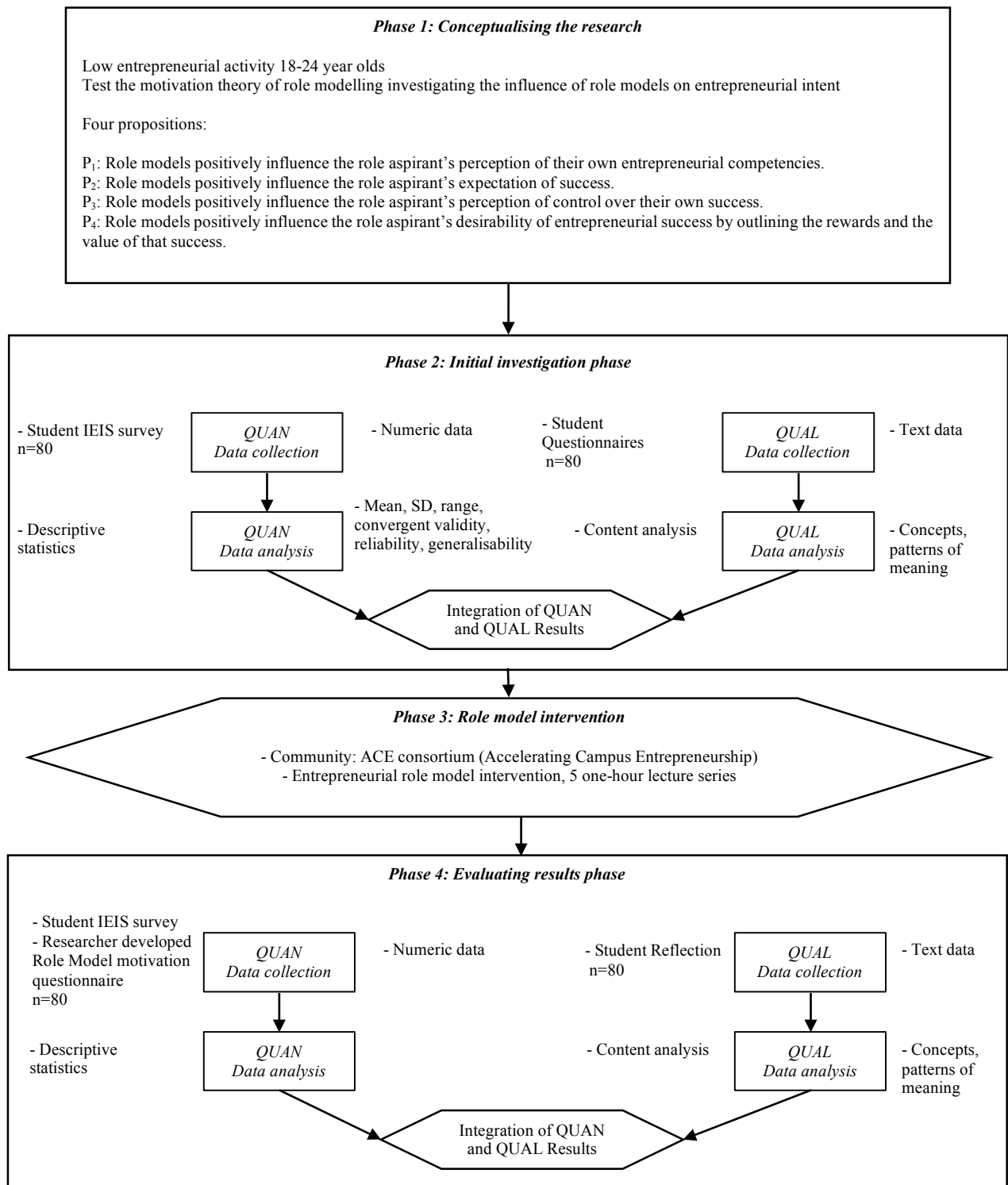


Figure 1: 4 phase mixed-method design (source: current research)

Section 2 discusses the three stages of questionnaire design and the importance of the pilot study to test for language and order and if there is bias in student responses. Section 3 discusses the pre-testing of the survey instruments and the proposed changes. Section 4 analyses the data from the pilot study as an input to the initial investigation phase. Section 5 discusses the pilot study testing of Thompson's (2009) Individual Entrepreneurial Intent Scale (IEIS). This scale will play an important role in determining the effectiveness of the intervention. Section 6 discusses the amended investigation questionnaire. Section 7 examines the underlying theory, motivation theory of role modelling, and the hypotheses of this study. Section 8 finalises the evaluation of results phase and section 9 discussed the next steps of this study. Section 10 concludes the paper and discusses the next stages of this research study.

## **2. Questionnaire Design**

Questionnaires enable researchers to collect information in a standardised format. When this data is gathered from a representative sample of a defined population, inferences of results can be made to the wider population (Rattray & Jones, 2007). This is important when we want to evaluate the effectiveness of an intervention. Entrepreneurship focused researchers typically use questionnaires to observe attitudes towards entrepreneurship, knowledge, personality traits, intent, and motivations. A review of the current literature indicates that empirical research aimed at establishing the importance of role models in influencing the entrepreneurial intent of potential entrepreneurs is scarce. As the aim of this research is to examine a link between role model influence and entrepreneurial intent, the questionnaire will aim to gather data on role model motivators.

According to Bowling (2014), the advantages of questionnaires as a method of data collection are that they are a quick method to gather data, are economical, and are generally easy to analyse. For questionnaires to be an accurate data collection tool, it is critical that the researcher and respondents must share fundamental assumptions about language and understand statement wording in the same manner. For this reason, a pilot questionnaire was crucial to test that these assumptions were met. Questions should remain open as closed questions limit the depth of

response and therefore the data may be diminished or incomplete (Bowling, 2014). Rattray and Jones (2007) discuss three stages of questionnaire design;

*1) What will the questionnaire investigate?* Recurring themes in the literature influencing entrepreneurial intent include; gender, age, family background, entrepreneurial education, and role model influence. When developing a questionnaire, items or questions are developed in a way that requires the participant to respond to a series of questions or statements. These items must reliably operationalise the key research concepts and must be relevant to the target group (Rattray & Jones, 2007). Table 1 summarises the concepts, propositions and interpretation of this research as presented in a previous paper of this study. By seeing what is achievable, it is proposed that the role aspirant's perceived attainability of entrepreneurial success will increase. Through admiration and internalisation of role model qualities, it is proposed that the desirability of entrepreneurial success will increase. In turn, their entrepreneurial intent will increase. It is proposed that the initial pre-intervention questionnaire will measure entrepreneurial intent and gather information on the gender, age, and personality traits of the students. The questionnaire will investigate their attitudes to entrepreneurship, barriers to entry, and rewards and value of those rewards. The questionnaire will measure the number of entrepreneurial role models that the students know (both family role models and non-family role models) and investigate how have these role models influenced their attitudes towards entrepreneurship. Finally, the questionnaire will give an understanding of how the students perceive the personality traits of the identified role models, if they admire those traits, and how they can relate to those traits.

The post-intervention evaluation questionnaire will again measure entrepreneurial intent to gauge if the role model intervention influenced the entrepreneurial intent of students. Attitudes to entrepreneurship, barriers to entry, and the rewards and value of those rewards will be investigated. The pre and post-intervention data will be compared and changes identified. Has the role model intervention increased the students' desirability of entrepreneurial success? Student reflection will help to investigate which role models had the greatest influence on entrepreneurial attitudes and why. As in the initial investigation, the questionnaire will measure how the students perceive the personality traits of the role models, if they admired those traits, and how they internalise those

traits. Did admiration and internalisation of role model qualities increase students’ perceived attainability of success by seeing what is achievable?

<b>Element</b>	<b>Identification</b>	<b>Definition</b>
<b>Concept</b>	Role Aspirants	An individual who makes active, although not necessarily deliberate, choices to become an entrepreneur.
	Entrepreneurial Traits	Traits related to entrepreneurial intent include achievement motivation, risk propensity, locus of control, independence motives, increased wealth motives, necessity motives.
	Entrepreneurial Role Models	Entrepreneurial role models serve as examples of the behaviour associated with entrepreneurs. They are inspirational. They represent the possible.
	Entrepreneurial Intent	Intent to start up a venture within the next five years
	Direct Link	Exposure to Entrepreneurial role models will increase the motivation of individuals wanting to become entrepreneurs
<b>Proposition</b>	By seeing what is achievable, it is proposed that students’ perceived attainability of entrepreneurial success will increase. By outlining the rewards, the value and attainability of entrepreneurial success, students’ desirability of success will increase. In turn, their entrepreneurial intent will increase. Admiration and internalisation of role model qualities will influence the effectiveness of the motivation.	<p>P1: Role models positively influence the role aspirant’s perception of their own entrepreneurial competencies.</p> <p>P2: Role models positively influence the role aspirant’s expectation of success.</p> <p>P3: Role models positively influence the role aspirant’s perception of control over their own success.</p> <p>P4: Role models positively influence the role aspirant’s desirability of entrepreneurial success by outlining the rewards and the value of that success.</p>
<b>Interpretation</b>	Role models have an impact on the entrepreneurial intent of individuals to start a business	Based on expectancy-value theory of motivation, individuals will be more inclined to take up entrepreneurship as an alternative career path if they believe they have the competencies to do so, if they expect success, if they sense that they have control over their own success, and finally if they value the rewards of that success. Role models help to improve these perceptions.

Table 1: The concepts, propositions, and interpretation of this research (source: current research)

2) *What type of scales can be used?* In entrepreneurship research, Likert-type scales are commonly used. The Likert scale assumes attitudes can be measured and that strength of the attitude is linear. A five-point Likert scale will be primarily used for all questions where a quantitative measure of the strength of an attitude is required. It is proposed that Thompson's (2009) IEIS scale will be used to measure entrepreneurial intent before and after the intervention. The scale features six items that are a combination of direct measures of intent and measures of behaviours that strongly imply intent. The IEIS scale questionnaire consists of six substantive and four distracter items. Table 2 outlines the questionnaire items for Thompson's IEIS. Entrepreneurial intent will be measured pre-and post-intervention and the results analysed and compared.

#### **Individual Entrepreneurial Intent Scale**

**Question: Thinking of yourself, how true or untrue is it that you:**

**Items:**

**1: Intend to set up a company in the future**

**2: Plan your future carefully\***

**3: Read business newspapers\***

**4: Never search for business start-up opportunities (R)**

**5: Read financial planning books\***

**6: Are saving money to start a business**

**7: Do not read books on how to set up a firm (R)**

**8: Plan your finances carefully\***

**9: Have no plans to launch your own business (R)**

**10: Spend time learning about starting a firm**

**\* Distracter items, not to be included in scale analyses.**

**- Items marked (R) are reverse coded in scale analyses.**

**- Interval measure runs 1 = very untrue, 2 = untrue, 3 = slightly untrue, 4 = slightly true, 5 = true, 6 = very true.**

Table 2: IEIS survey questions. Sourced: Thompson (2009, p.680)

3) *How do I generate items for my questionnaire?* Questionnaire development involves significant pilot work to improve wording and content (Rattray & Jones, 2007). It is advisable to revisit the research questions regularly to assure that the items are relevant to the research problem. The pilot study can test for language and order and if these bias the responses. Leading questions, double negative questions, and double-barrelled questions should be

avoided. By utilising both positively and negatively worded questions intermittently acquiescent response bias can be avoided. Incorporating open-ended questions allows respondents to expand their answers giving the research additional scope for analysis. Table 3 outlines the pilot study questions. Depending on answers to specific questions, students will be asked for more detail, e.g. if they have family role models then specific questions will be asked.

### **Pilot Questionnaire Items**

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1: Do you have any family that you would consider to be entrepreneurs?

*If Yes:*

What family member(s) would you consider to be entrepreneurs?

What type of entrepreneurial activity are they involved in?

Have they influenced you to consider entrepreneurship as an alternative career path in the future? [Positively, negatively, no influence]

---

2: I plan to start a new business: [On graduation, 1-3 years after graduation, 4-6 years after graduation, more than 6 years after graduation, undecided, never]

---

3: Has your attitude towards starting a business changed after commencing IPD (Innovative Product Development)?

*If Yes:*

How has commencing IPD influenced your attitude to starting a business in the future?

---

4: What would you say are the barriers to starting a business for you?

How do you think you could overcome those barriers?

---

5: Do you think if you started a business that it would be a success? Why do you think your business would be a success?

---

6: What would you say would be the rewards of being an entrepreneur?

How would you value those rewards?

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7: What personal attributes would you say you have that would make you a successful entrepreneur? Would you consider yourself a risk taker? Any examples?

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8: Do you know or have you met any entrepreneurial role models?

*If Yes:*

Who is the entrepreneurial role model?

What entrepreneurial activities are they involved in?

What attributes in that role model do you admire (if any)?

Did they influence your intent to become an entrepreneur in any way?

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Table 3: Summary of pilot study questions (source: current research)

### 3. Pre-testing of survey instruments

Pre-testing of the survey instrument involved sending an initial questionnaire to students in the third year of a four-year Honours degree or a five-year Masters degree in Mechanical Engineering and Biomedical Engineering. The students are in the early stages of an entrepreneurial module, Innovative Product Development. This module will be their first exposure to entrepreneurial education as part of their full-time studies and entrepreneurial intent may be low at this stage. It is expected that during the year students' perceptions of their own ability and the attainability of entrepreneurial success will increase. Liñán et al. (2011) explain the importance of entrepreneurship education on students' entrepreneurial attitudes. Entrepreneurship education acts as a catalyst for other entrepreneurial factors. Students gain valuable skills, increasing their perception that success is achievable. Besterfield-Sacre et al. (2016) established that the perception amongst engineering entrepreneurial instructors was that the skills necessary to be an entrepreneur are mostly developed or learned and therefore there is the possibility that all those that desire entrepreneurship as a career can be taught the necessary skills.

The survey was emailed to students using survey monkey to 105 students, with 95 respondents. The initial part of the survey looked at entrepreneurial role models and attitudes and the final page of the survey asked questions relating to Thompson's (2009) IEIS. The average time for completion of the survey was nine minutes. The pilot study gave an indication of the respondents' understanding of each question. Questions with predefined response choices gave clear information and allowed for easy categorisation. For example, "I plan to start a new business: [On graduation, 1-3 years after graduation, 4-6 years after graduation, more than 6 years after graduation, undecided, never]" was answered by all respondents and clearly identifies those that have decided they would like to start a business in the future, those that have decided they will never start a business in the future, and those that are undecided. Testing of Thompson's (2009) IEIS scale to measure entrepreneurial intent indicates that the questions were clear and understood. Open-ended questions allowed respondents to expand their answers but the level of engagement in responding to these questions varied. Certain respondents gave clear detailed answers with clear insight and other respondents gave one-word answers. Limiting the answers to pre-determined options would allow for easier categorisation but then rich data may be lost. A compromise between closed-ended and open-ended questions is required. When asking "*What would you say would be the rewards of being an entrepreneur?*"

respondents could be given four options; independence and flexibility of being an entrepreneur, personal satisfaction, wealth. When analysing the responses most answers can be coded to one of the above rewards. By leaving the question open-ended new rewards may be identified that would otherwise be lost. One suggestion is to change the question to “*What would you say would be the greatest rewards of being an entrepreneur?*”? The follow-up question, “*How would you value those rewards?*” will then be modified to ask, “*Why do you value those rewards?*”

Personality traits play an important role as predictors of entrepreneurship. Achievement motivation, locus of control, risk propensity, innovativeness, and proactivity, or proactive personality are all common personality traits evident from past entrepreneurship research (Brandstätter, 2011; Fairlie & Holleran, 2012; Leutner et al., 2014; Verheul et al., 2012; Yan, 2010). One specific aim of the questionnaire was to identify personality traits in answers to specific questions both directly and indirectly. “*Do you think if you started a business that it would be a success?*” indirectly gives an indication of locus of control. “*What would you say would be the rewards of being an entrepreneur?*” can help to identify achievement motivation. Innovativeness and proactivity can be indirectly identified from the question; “*What personal attributes would you say you have that would make you a successful entrepreneur?*”? Risk propensity can be identified directly from the questions; “*Would you consider yourself a risk-taker?*”, “*Please give any examples of being a risk-taker.*” Many students responded that they considered themselves risk-takers but many found it difficult to give examples.

When analysing the results of the pilot study, it was evident that respondents did not understand the question; “*What attributes in that role model can you relate to (if any)?*”. Many answered they were unsure or left the question blank. It is proposed that this question be divided into two distinct areas; the first to identify how the students perceive the attributes of the entrepreneur and then how the students perceive their own attributes. Inferences can then be made on their admiration of those qualities by looking for commonalities between their own personality traits and those of the entrepreneurial role models. Responses to the question “*Do you know or have you met any entrepreneurial role models?*” indicate duplication of data with respondents including family members as other role models. Responses also included famous entrepreneurs such as Bill Gates and Steve Jobs. As the research looks at entrepreneurs within the participants’ network, the question wording should be changed. It is proposed that the wording be changed to “*Do you personally know or have you personally met any non-family entrepreneurs?*”



#### 4. Initial pilot study findings and link to entrepreneurial research

The pilot questionnaire was distributed to 105 students, with 95 respondents, 78% male, 22% female, with an average age of 21 as outlined in Figure 2. Sixty-five percent of respondents were Mechanical Engineering students with the remainder studying Biomedical Engineering.

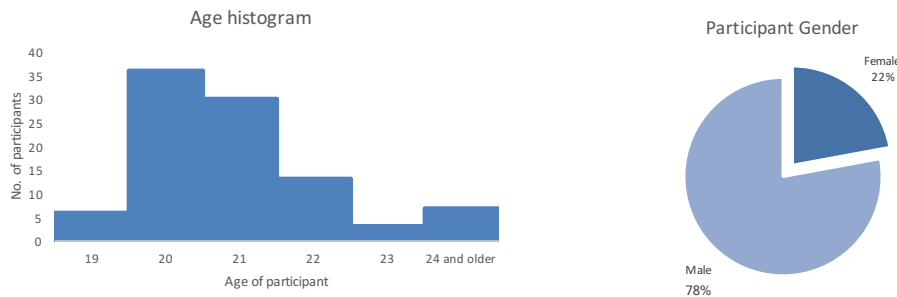


Figure 2: Pilot study participant demographics (source: current research)

An important consideration in role model motivation will be the effect of gender matching in role model motivation. The sample population in this research study will comprise of approximately 20% female participants. Lockwood (2006) examined if gender matching of career role models was important for women particularly in career environments where they were outnumbered by men. Would female role aspirants identify more with female role models? Lockwood (2006) investigated the degree to which gender matching of role models and role aspirants influenced the effectiveness of the role model motivation. She first exposed individuals to a highly successful role model who shared their career objectives and either matched or mismatched on gender. Her study concluded that women are inspired by “outstanding” women in their area but not by “outstanding” men in the same area. This is more pronounced in areas where women consider themselves to be in a minority group. The inspiration was found to be a result of their perception that they were like the role model and might become the role model in the future. It was also concluded that gender matching was less effective with men. Lockwood (2006, p.41) concluded that “gender matching is important for women in determining their ability to map themselves onto a role model and view the model as an example of what they can become in the future.” It will be important to ensure gender balance in any role model intervention.

#### 4.1 Entrepreneurial intent pilot study observations

To further gauge initial entrepreneurial intent, and allow a comparison to Thompson’s IEIS, respondents were asked if and when they planned to start a new business (Q2, Table 3). Results are graphically represented in Figure 3. Two percent indicated they would start a business on graduation, 15% within the first six years of graduation, and 7.5% more than six years after graduation. Two of the 95 respondents indicated that they planned to start immediately after graduation, one male and one female. Both had family role models and indicated that they had a positive influence on their decision to start a business. The male respondent has already started his own company and has participated in “Student Inc.,” a student incubation programme that ran over three summer months. Students receive €4,000 towards set-up costs and receive mentoring and support during the programme. Both considered themselves to be risk-takers and both showed a high internal locus of control, believing that if they started a business, their start-up would be successful.

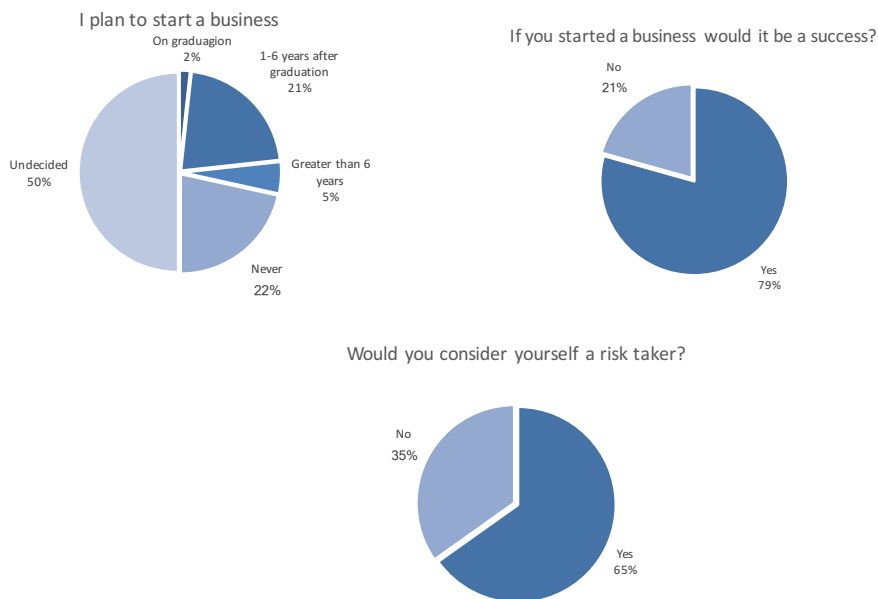


Figure 3: Pilot study attitudes to entrepreneurship (source: current research)

#### 4.2 Access to entrepreneurial role models

Thirty-three percent of respondents indicated they had family members that they considered to be entrepreneurs as outlined in Figure 4. Fifty-eight percent of those with family role models

indicated that they positively influenced their decision to start a business in the future. Thirty percent stated that family role models had no influence and 12% indicated that family entrepreneurs had a negative impact on their decision to start a business in the future. According to Holienka et al. (2013), family role models influence students' attitudes about entrepreneurship. Two out of five entrepreneurial role models emerge from strong links of family members and friends. Starting a business is positively correlated with having parents who are or were entrepreneurs (Chlosta et al., 2012; Hoffmann et al., 2015). Holienka et al. (2013) also caution that family role model influence is moderate and cannot fully explain entrepreneurial intent. They conclude that family role models are a factor influencing entrepreneurial intent but other factors are also at play.



Figure 4: Family role models and influence on attitude to entrepreneurship (source: current research)

Twenty-six percent of respondents indicated that they knew or had met additional entrepreneurial role models. Eighty-nine percent of those that had met entrepreneurial role models stated a positive influence on their intent to start a business in the future. Forty percent of respondents indicated that commencing the entrepreneurship-focused module, Innovative Product Development, had influenced their attitude to start a business in the future. One of the common reasons given was the belief that starting a business was achievable and if they started a business that it was possible to make it a success. Responses included; *“Seeing other students starting businesses so soon after graduating”*, *“it has showed how achievable it is without having a business background.”*. Another common reason given was the perception that they were gaining the skills necessary to start a new business.

### **4.3 Entrepreneurial personality traits**

Achievement motivation, locus of control, risk propensity, innovativeness, and proactivity, or proactive personality are personality traits positively associated with entrepreneurship. Seventy-nine percent of respondents believed that if they started a new business that it would be a success, indicating a high internal locus of control. They believe that they are in control of their destiny. Those with a high internal locus of control tend to see a strong connection between their actions and the consequences of those actions. Risk propensity is defined as “the perceived probability of receiving the rewards associated with the success of a proposed situation, which is required by an individual before they will subject themselves to the consequences associated with failure, the alternative situation providing fewer rewards as well as less severe consequences than the proposed situation” (Brockhaus, 1980, p. 513). Sixty-five percent of all respondents identified themselves as risk-takers. Eighty percent of those planning to start a business in the future identified as risk-takers.

When asked what personality attributes were needed to be a successful entrepreneur, the most common theme was hard work and determination (40% of all respondents), an indicator of achievement motivation and locus of control. Achievement motivation is one of the most widely cited personality characteristics of entrepreneurs and is characterised by a desire to do well to attain a feeling of accomplishment. Achievement motivation predisposes an individual to seek out an entrepreneurial position, which the entrepreneur believes produces more achievement satisfaction than could be derived from other kinds of positions (McClelland, 1961). Five percent of respondents indicated innovativeness as a personal trait conducive to entrepreneurship.

### **4.4 Perceived barriers to entry and entrepreneurial rewards**

The most common barrier to entry to starting a new business was a lack of funding. Fifty-seven percent of respondents indicated a lack of finance as the greatest barrier. When asked how would they overcome the barrier of lack of funding, the majority did not have an answer. This should be a key factor in the role model intervention. What funding structures are in place to support entrepreneurs and in particular young entrepreneurs? Role models will discuss their own barriers and how they overcame those barriers making entrepreneurship more achievable. The greatest reward to starting a new business was identified as “being your own boss” (35%)

followed by self-satisfaction (20%), and wealth motivation (15%). Most respondents valued the rewards highly. All of these rewards are positive entrepreneurship motivation factors or pull factors. They are individually driven rather than influenced by the external environment.

Approximately 61% of respondents were undecided if they would consider starting a business in the future and 14% indicated they would never consider starting a business. The study, in addition to analysing changes in entrepreneurial intent, will also take a measure of how many undecided participants will indicate a change both positively and negatively.

## **5. Testing Thompson's IEIS**

Thompson's IEIS has been utilised extensively in entrepreneurship literature, particularly in the field of education. To test the IEIS, Thompson sent a questionnaire incorporating indicators of entrepreneurship to 487 subjects selected randomly from a large international sample. The population consisted of a diverse group of international undergraduate and post graduate students, and non-students (in full time employment). From further testing, Thompson (2009, p. 687) concluded that the IEIS was shown to "incorporate high content validity, plus broad applicability across populations by nationality, age, and occupation".

As part of the pilot study for this research, Thompson's IEIS questions were added at the end of the survey. Eighty-nine students of the ninety-five that responded, completed the IEIS questionnaire. Six students failing to complete the final page of the survey. As the IEIS will form an integral part of this research study it is proposed that the IEIS questions will be asked at the first stage of the survey, increasing the rate of completion.

Results of the pilot study testing of Thompson's IEIS can be seen in Table 4. The scale's Cronbach's alpha coefficient of internal reliability was calculated to be 0.762, hence, the scale seemed to have acceptable internal reliability. The contribution of individual items to overall internal reliability was checked and found to be positive in each case, with the average corrected item-total correlation being 0.585. The scale's summated mean was 2.85 (SD 1.63), significantly below the hypothetical midpoint of 3.50. It can be concluded that the components of the scale are sufficiently inter-correlated and the grouped items measure the underlying variable (Sullivan & Artino, 2013). The IEIS is a good indicator of entrepreneurial intent but it is best used as a comparative tool.

### Pilot Study IEIS Results

N	89
Scale mean	2.85
SD	1.63
Scale Cronbach's Alpha Coefficient	0.762
<b>Corrected Item-Total Correlations</b>	
1: Intend to set up a company in the future	0.633
4: Never search for business start-up opportunities	0.569
6: Are saving money to start a business	0.448
7: Do not read books on how to set up a firm	0.439
9: Have no plans to launch your own business	0.614
10: Spend time learning about starting a firm	0.348

Table 4: Pilot Study IEIS Test results (source: current research)

### 6. Investigation stage questionnaire

The aim of the investigation phase will be to measure the baseline entrepreneurial intent and investigate the baseline entrepreneurial attitudes, perceived barriers to entrepreneurship, value of entrepreneurial success, and the entrepreneurial influence of role models within their network. A mixed-method questionnaire will be utilised. The proposed changes to the questionnaire are outlined in Table 5 incorporating the findings of the pilot study.

The first step of the investigation phase will be to measure entrepreneurial intent. Thompson's (2009) IEIS scale will be used and this will give a baseline intent before the intervention. Based on the results of the pilot study, students will be questioned on the personality traits of their role models and given the following options; ambitious, innovative, proactive, confident, dedicated, hard-working, and belief in their own self. Their own personality traits will be interpreted from open-ended questions and then coded using qualitative data analysis. The results of the investigation phase will provide an input into the entrepreneurial role model lecture series.

### Changes to Questionnaire Items:

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1: Do you have any family that you would consider to be entrepreneurs?

*If Yes:*

What family member(s) would you consider to be entrepreneurs?

What type of entrepreneurial activity are they involved in?

How have they influenced you to consider entrepreneurship as an alternative career path in the future? [5 point

**Likert Scale:** 1 = highly positively influenced, 2 = positively influenced, 3 = no influence, 4 = negatively influenced, 5= highly negatively influenced]

Why have they influenced your decision to become an entrepreneur positively or negatively?

**Please indicate your level of agreement with the following statements [1 strongly disagree, 5 strongly agree]**

They are a risk-taker

They are ambitious

They are innovative

They are hard-working

They are proactive

They strongly believe in their own ability and believe that they will be successful

---

2: Do you *personally know* or *have you personally met* any non-family entrepreneurs?

*If Yes:*

Who is the entrepreneur?

What type of entrepreneurial activity are they involved in?

How have they influenced you to consider entrepreneurship as an alternative career path in the future? [5 point

**Likert Scale:** 1 = highly positively influenced, 2 = positively influenced, 3 = no influence, 4 = negatively influenced, 5= highly negatively influenced]

Why have they influenced your decision to become an entrepreneur positively or negatively?

**Please indicate your level of agreement with the following statements [1 strongly disagree, 5 strongly agree]**

**(See family member traits)**

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Table 5: Investigation stage questionnaire changes based on pilot study findings (source: current research)

## 7. Underlying motivation theory of role modelling

Following on from the conceptualisation of the study, the following propositions were offered;

P<sub>1</sub>: Role models positively influence the role aspirant's perception of their own entrepreneurial competencies.

P<sub>2</sub>: Role models positively influence the role aspirant's expectation of success.

P<sub>3</sub>: Role models positively influence the role aspirant's perception of control over their own success.

P<sub>4</sub>: Role models positively influence the role aspirant's desirability of entrepreneurial success by outlining the rewards and the value of that success.

It is important at this stage to re-examine the foundation theory of this research and to develop a series of hypotheses based on the initial conceptualisation. The underlying theory will be the motivational theory of role modelling (Morgenroth et al., 2015), an extension of the expectancy-value theoretical framework. Morgenroth et al. (2015) proposed a theoretical framework emphasising how the power of role models can be utilised to increase role aspirants' motivation, reinforce their existing goals, and facilitate them adopting new goals. As outlined by Lockwood (2006, p.36), "role models are individuals who provide an example of the kind of success that one may achieve, and often also provide a template of the behaviours that are needed to achieve such success". This definition highlights the importance of role models as behavioural models but in addition to this, role models characterise what future opportunities are available. McIntyre et al. (2011) discuss how role models send the message "*I can do this, so you can do this too*" to role aspirants. They also found those role models that achieve success by their own hard work and determination were more effective as role model motivators than those that they perceived having success handed to them.

Role model research provides evidence that goal embodiment is a key driver influencing expectancy (Bagès & Martinot, 2011; Marx & Roman, 2002). Goal embodiment refers to "the degree to which a role model has successfully reached the role aspirant's goal and is thus closely linked with the capacity to motivate a role aspirant to move toward an already existing goal" (Morgenroth et al., 2015, p. 7). The role aspirant's goal in relation to achievement is assumed to be success. As concluded by Morgenroth et al. (2015), role model characteristics and role aspirant characteristics interact and influence the role aspirant's perception of goal embodiment. Perceptions of goal embodiment increase the role aspirant's vicarious learning through the experience of the role model. Goal embodiment also reinforces existing goals and leads to the acquisition of new skills. This increase in vicarious learning increases the confidence of the role aspirant in reaching their success goals, increasing their expectancy and in turn increasing their entrepreneurial intent. This leads to the first hypothesis;



*H<sub>1</sub>: Through goal embodiment role models reinforce the confidence of achieving success, influencing expectancy, and in turn significantly impacting entrepreneurial intent.*

As proposed by Morgenroth et al. (2015), role models represent the possible and change the perception of external barriers. As outlined in the pilot study, finance was the greatest perceived barrier to starting a business. Goal embodiment and attainability will influence the effectiveness of changing perceptions on barriers to entry. Attainability indicates the level to which a role aspirant can see themselves being like the role model at some point in the future, i.e. their future self. Attainability does not only refer to present similarity to the role model but also relates to future similarity. “By seeing someone else reach a goal (goal embodiment) and believing that one can be like said person (attainability), role aspirants can imagine themselves in the position of this role model and thus believe in reaching the goal themselves.” (Morgenroth et al., 2015, p. 8). The level of attainability is also important. If a role model is perceived to be too successful then the role aspirant may not see the success as attainable and this can negatively impact their expectation of success, impacting their motivation. If the role model is not successful enough, they will not embody the role aspirant’s achievement goals. This leads to the second and third hypotheses;

*H<sub>2</sub>: Through goal embodiment role models change perceived barriers, influencing expectancy, and in turn significantly impacting entrepreneurial intent.*

*H<sub>3</sub>: Through attainability role models change perceived barriers, influencing expectancy, and in turn significantly impacting entrepreneurial intent.*

Morgenroth et al. (2015) propose that role models can be inspirational, influencing value. For a role model to be inspirational the role aspirant needs to perceive them as desirable. Desirability indicates the level of positivity to which a role aspirant perceives a role model, i.e. the level a role aspirant wants to be like the role model. Quimby and De Santis (2006) provided evidence that career options are often influenced by the desire to be like the role model. Desirability results in identification, internalisation, and admiration. Identification refers to the identification and embodiment of the role model’s traits with that of the role aspirant’s traits. Internalisation refers to the process whereby the role aspirant adopts the behaviour matching that of their own value system. Admiration refers to the desirable characteristics of the role model as perceived by the role aspirant, i.e. the role aspirants’ desire to emulate the qualities of the role model. Morgenroth et al. (2015) proposed that desirability contributes to the value

role aspirants attach to specific goals and to the adoption of new goals. This leads to the fourth and fifth hypotheses;

*H<sub>4</sub>: Perceived desirability contributes to the importance role aspirants place on success goals, influencing value, and in turn significantly impacting entrepreneurial intent.*

*H<sub>5</sub>: Perceived desirability contributes to the adoption of new success goals, influencing value, and in turn significantly impacting entrepreneurial intent.*

By seeing what is achievable, it is proposed that students' perceived attainability of entrepreneurial success will increase. By outlining the rewards, the value and attainability of entrepreneurial success, students' desirability of success will increase. In turn, their entrepreneurial intent will increase. The role model intervention will focus on two specific areas; the desirability of success i.e. the value, and the attainability of success, i.e. the expectancy. Based on the motivational theory of role modelling the following research question is proposed;

*Can role models increase students' entrepreneurial intent by increasing confidence in their entrepreneurial competencies and by highlighting the rewards of entrepreneurial success?*

## **8. Evaluation of results phase**

The evaluation of results phase will comprise of two parts. A quantitative questionnaire that will test the hypotheses outlined based on the motivational theory of role modelling (Morgenroth et al., 2015) and will measure students' entrepreneurial intent. Secondly, a qualitative data analysis will focus on the effect of exposure to entrepreneurial role models. This will ensure that the research is not myopic by focusing solely on entrepreneurial intent and will offer an extra richness in the research data allowing for further investigation as required. The qualitative data will be collected using student reflection after the role model intervention.

Figure 5 graphically represents the variables and hypotheses associated with the testing of the motivational theory of role modelling. The quantitative questionnaire will collect data and a regression analysis will be performed. The questionnaire will be divided into two sections. Section A will collect the data corresponding to the entrepreneurial intent and will be measured

using Thompson's IEIS as previously outlined in Table 2. Section B will measure the data corresponding to the predictor variables and will use a five-point Likert scale with endpoints labelled 1 (strongly disagree) and 5 (strongly agree). The evaluation stage quantitative questionnaire is outlined in Table 6.

SPSS software will be used to analyse the data. Cronbach's Alpha will be calculated for all variables to check acceptability (above the recommended cut-off value of .70 (Hair et al., 2006). Factoral validity will be checked to ensure one dimension is obtained and factor loadings are above the recommended cut-off value of 0.4 (Hair et al., 2006). If the Cronbach's Alpha criteria is not met then items will be deleted (one at a time) to check if Cronbach's Alpha can be improved. A linear regression analysis will be performed. The data will be checked for influential outliers. The Durban-Watson statistic will be computed to ensure that no collusion exists in the data. Collinearity will be assessed and the tolerance will be checked to ensure it is greater than 0.1 with a VIF (variance inflation factor) less than 10. A histogram, normal p-p plot, and scatter diagram will be generated and analysed for the dependant variable *intent*. The plots will be checked to ensure that the underlying data assumptions have been met. The adjusted R<sup>2</sup> will be calculated and the t-statistics and p value for each independent variable will be analysed and the results presented. Based on the findings all hypotheses will be reviewed and the regression formula will be generated. This will give an indication as to which independent variable has the greatest influence on the dependant variable, *intent*. It is proposed that following testing of these hypotheses that this questionnaire may be used as a quantitative scale to measure the effect that the role models had on entrepreneurial intent.

Reflection is commonly discussed as a learning promotion tool facilitating learning through experience (Quinton & Smallbone, 2010). It is a valuable tool when collecting qualitative data and allowing students to reflect on their own learning. The entrepreneurial role model lecture series will be delivered within the module Engineering Management (a common module within the programmes Mechanical Engineering and Biomedical Engineering), with learning outcomes looking at entrepreneurship and innovativeness. Students will be asked to reflect on their exposure to the role models and how did it lead them to think in a different way about entrepreneurship. What was their attitude to starting a business and has it changed following exposure to role models? Would the exposure make them more inclined to consider

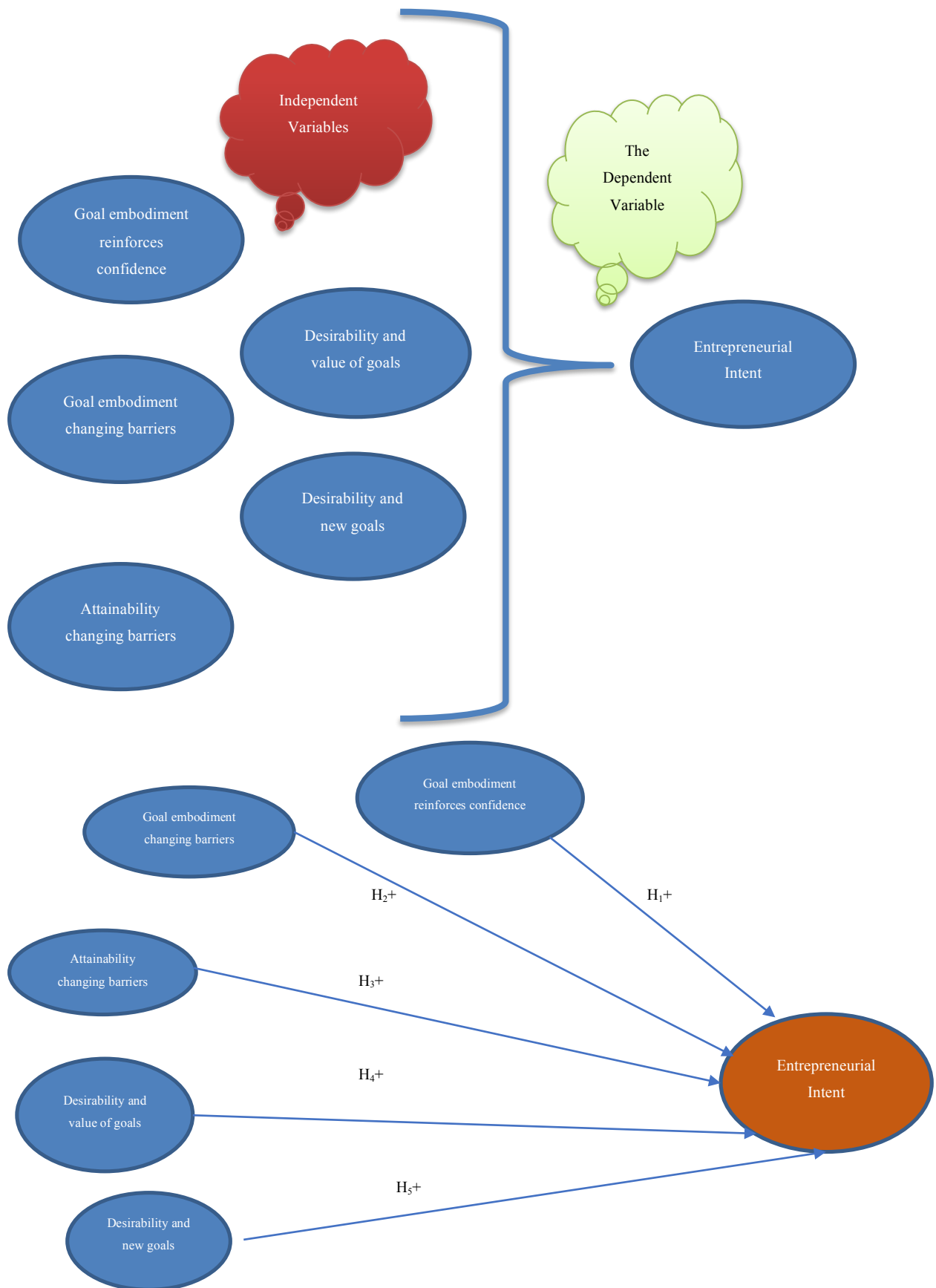


Figure 5: Graphical representation of model variables and hypotheses (source: current research)

**Section B:**

**Based on your perceptions of the role models, please indicate your level of agreement with the following statements**

*Through goal embodiment role models reinforce the confidence of achieving success, influencing expectancy, and in turn significantly impacting entrepreneurial intent*

1: I think the role models have been successful in starting a business

2: I share the same success goals as the role models

3: I think I have similar qualities to be a successful entrepreneur

4: I share the same work ethic as the role models

*Through goal embodiment role models change perceived barriers, influencing expectancy, and in turn significantly impacting entrepreneurial intent*

5: The role models have overcome significant barriers to becoming an entrepreneur

6: I can overcome finance barriers as demonstrated by the role models

7: I can overcome my lack of experience as an entrepreneur as demonstrated by the role models

*Through attainability role models change perceived barriers, influencing expectancy, and in turn significantly impacting entrepreneurial intent*

8: I have a better understanding of support structures available to me

9: I now think there are less barriers to starting a business

10: I am now more convinced that if I started a business it would be a success

11: I could not attain the same level of success as these role models

12: I can see my future self achieving similar success as these role models

*Perceived desirability contributes to the importance role aspirants place on success goals, influencing value, and in turn significantly impacting entrepreneurial intent*

13: Now I would value being my own boss more than before attending these lectures

14: Now I would value being financially independent more than before attending these lectures

15: I would get self-satisfaction from starting a successful business from hearing these role models

16: I admire these role models and what they have achieved

*H<sub>5</sub>: Perceived desirability contributes to the adoption of new success goals, influencing value, and in turn significantly impacting entrepreneurial intent*

17: I would value being an entrepreneur more now than before

18: I have realised new rewards of being an entrepreneur

19: I would like to have the same rewards from a successful business as these entrepreneurs

**Interval measure runs 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree**

Table 6: Researcher developed evaluation phase quantitative questionnaire (source: current research)

entrepreneurial career choices? Students will be asked to reflect on which role model they identified with most and why. Which role model did they admire most and why? Which role model would they perceive to be most similar to them and has this influenced their perception of their own skills. Which role model was the most successful and do they think it is feasible that they could obtain similar success (attainability). Students will be asked to comment on the rewards of entrepreneurial success and if they value those rewards more following exposure to the role models. Finally, what do they now perceive as the barriers to entry to entrepreneurship and if the exposure to role models has given them knowledge on how to overcome those barriers. The qualitative data will then be analysed and coded using Nvivo qualitative data analysis software and compared to the investigation phase data.

### **9. Operationalising the research study**

Originally it was proposed to use an experimentation methodology whereby one experimental group of students would undergo an intervention and the control group would not. This was ruled out as it was deemed unethical to give one group a different learning experience. All students will now have the same opportunity to attend the entrepreneurial talks, i.e. the intervention. The role model lecture series will be incorporated into an engineering management module. As part of the indicative content of this module students research business environments, innovation and entrepreneurship. Entrepreneurial role models will be selected with the assistance of the ACE group (Accelerating Campus Entrepreneurship) in CIT. The entrepreneurial talks will be approximately one hour in duration and students will be asked to attend four out of five talks. The entrepreneurs will be allowed to set their own content but will be asked to discuss their entrepreneurial journey, talk about themselves and their personality, discuss their barriers to entrepreneurship and how they overcame those barriers, and to discuss the rewards of entrepreneurship and how they value those rewards. A question and answers session will conclude the talk.

Ethical approval was sought from WIT, the institute supervising the research study, and CIT, the institute where the research study will be implemented. Ethical approval was given by both institutes. Private data identifying the subjects will not be reported. All participants will be anonymised. Students must attend the entrepreneurial talks as part of their module but participation in the study is entirely voluntary. Consent forms were developed with clear

information on the research study, how data will be collected and stored, and making it clear that participation is entirely voluntary.

Figure 6 outlines the data collection timeline for this research study. Data will be collected over the first semester of academic year 2019/2020. A semester consists of 12 weeks and collecting the data over a limited period reduces the impact of extraneous variables. The pilot study has been completed and the investigation stage will commence on September 29<sup>th</sup>.

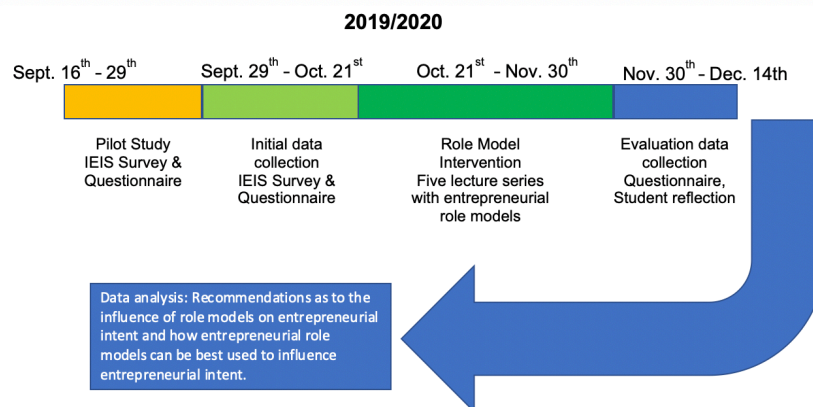


Figure 6: Research timeline (source: current research)

## 10. Concluding remarks

This paper discusses the operationalising of a mixed-methods research design utilised to examine a link between role model influence and entrepreneurial intent. This research is undertaken as part of a larger doctoral research study by applying mixed-method research on the researcher's own organisation. The research examines how entrepreneurial role models can be used to motivate students to consider entrepreneurship as a career.

An initial pilot study was conducted to gauge respondents' understanding of questions and to test for language and bias. The survey was sent to 105 students, with 95 respondents. These students were in year three of a four years Honours degree or a five-year Masters degree in Biomedical or Mechanical Engineering. The students just commenced their first entrepreneurial module and are one year behind the students participating in the overall study. The initial pilot study shows a strong correlation to common themes in entrepreneurship research. Personality traits such as achievement motivation, locus of control, risk propensity,

and innovativeness were evident in those showing a strong entrepreneurial intent. Funding was the most common barrier to starting a new business. Two percent indicated they would start a business on graduation, 15% within the first six years of graduation, and 7.5% more than 6 years after graduation.

Entrepreneurial intent was measured using Thompson's IEIS. The scale's Cronbach's alpha coefficient of internal reliability was calculated to be 0.762, hence, the scale seemed to have acceptable internal reliability. When benchmarking the students in the pilot study to the international sample of students in Thompson's (2009) study, the intent was similar, 2.85 in the pilot study sample and 2.99 in Thompson's student sample.

The aim of the investigation phase will be to measure the baseline entrepreneurial intent and investigate baseline entrepreneurial attitudes, perceived barriers to entrepreneurship, value of entrepreneurial success, and the entrepreneurial influence of role models within their network. A mixed-method questionnaire will be utilised. The results of the investigation phase will then inform the role model intervention. The intervention stage will incorporate five entrepreneurial role model lectures. The evaluation phase will comprise of two parts. A quantitative questionnaire will test the hypotheses outlined and will again measure the students' entrepreneurial intent. Secondly, a quantitative data analysis will focus on the effect of exposure to the entrepreneurial role models. The research study will be implemented in semester one of the 2019 academic year. Approximately 80 students will be involved in the study. Role models at different stages of business start-ups will be involved in the lecture series and a gender balance will be ensured.



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## **Appendices**

### Appendix A: Pilot Study Phase 2 Investigation Stage Questionnaire

## Entrepreneurship Lecture Series PILOT

Student Number

Gender

Male

Female

Age

Class

DME4

DBE4

## Entrepreneurship Lecture Series PILOT

Do you have any family that you would consider to be entrepreneurs?

## Entrepreneurship Lecture Series PILOT

What family member(s) would you consider to be entrepreneurs?

What type of entrepreneurial activity are they involved in?

What attributes in that role model do you admire (if any)?

Have they influenced you to consider entrepreneurship as an alternative career path in the future?

- Positively influenced
- No influence
- Negatively influenced

## Entrepreneurship Lecture Series PILOT

I plan to start a new business

- On graduation
- 1-3 years after graduation
- 4-6 years after graduation
- More than 6 years after graduation
- Undecided
- Never

## Entrepreneurship Lecture Series PILOT

Has your attitude towards starting a business changed after commencing IPD?

- Yes
- No

How has commencing IPD influenced your attitude to starting a business in the future?

## Entrepreneurship Lecture Series PILOT

What would you say are the barriers to starting a business for you?

How do you think you could overcome those barriers?

Do you think if you started a business that it would be a success?

Yes

No

## Entrepreneurship Lecture Series PILOT

Why do you think your business would be a success?

## Entrepreneurship Lecture Series PILOT

What would you say would be the rewards of being an entrepreneur?

How would you value those rewards?

What personal attributes have you that would make you a successful entrepreneur?

Would you consider yourself a risk taker?

Yes

No

## Entrepreneurship Lecture Series PILOT

Please give any examples of being a risk taker?

## Entrepreneurship Lecture Series PILOT

Do you know or have you met any entrepreneurial role models?

## Entrepreneurship Lecture Series PILOT

Who is the entrepreneurial role model?

What type of entrepreneurial activity are they involved in?

What attributes in that role model do you admire (if any)?



What attributes in that role model can you relate to (if any)?

Did they influence your intent to become an entrepreneur in any way?

- Yes
- No

Do you know any other entrepreneurial role models?

- Yes
- No

## Entrepreneurship Lecture Series PILOT

**Thinking of yourself, how true or untrue is it that you:**

Intend to set up a company in the future

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Plan your future carefully

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Read business newspapers

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Never search for business start-up opportunities

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Read financial planning books

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Are saving money to start a business

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Do not read books on how to set up a firm

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Plan your finances carefully

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Have no plans to launch your own business

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Spend time learning about starting a firm

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

## Appendix B: Pilot Study Phase 4 Evaluation Stage Questionnaire



Post Talk Entrepreneurship Lecture Series Pilot

Student Number

Gender

- Male  
 Female

Age

Class

- DME4  
 DBE4



Post Talk Entrepreneurship Lecture Series Pilot

**Thinking of yourself, how true or untrue is it that you:**

Intend to set up a company in the future

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Plan your future carefully

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Read business newspapers

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Never search for business start-up opportunities

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Read financial planning books

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Are saving money to start a business

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Do not read books on how to set up a firm

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Plan your finances carefully

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Have no plans to launch your own business

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Spend time learning about starting a firm

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true



Post Talk Entrepreneurship Lecture Series Pilot

**Based on your perceptions of the role model speakers, please indicate whether you: (1) Strongly Disagree (2) Disagree (3) Neither Agree nor Disagree (4) Agree (5) Strongly Agree with each of the following statements.**

I think the role models have been successful in starting a business

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree



I share the same success goals as the role models

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

I think I have similar qualities to be a successful entrepreneur

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

I share the same work ethic as the role models

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree



Post Talk Entrepreneurship Lecture Series Pilot

**Based on your perceptions of the role model speakers, please indicate whether you: (1) Strongly Disagree (2) Disagree (3) Neither Agree nor Disagree (4) Agree (5) Strongly Agree with each of the following statements.**

The role models have overcome significant barriers to becoming an entrepreneur

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

I can overcome finance barriers as demonstrated by the role models

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

I can overcome my lack of experience as an entrepreneur as demonstrated by the role models

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree



Post Talk Entrepreneurship Lecture Series Pilot

**Based on attending the role model lectures, please indicate whether you: (1) Strongly Disagree (2) Disagree (3) Neither Agree nor Disagree (4) Agree (5) Strongly Agree with each of the following statements.**

I have a better understanding of support structures available to me

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

I now think there are less barriers to starting a business

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

I am now more convinced that if I started a business it would be a success

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

I could not attain the same level of success as these role models

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

I can see my future self achieving similar success as these role models

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree



## Post Talk Entrepreneurship Lecture Series Pilot

**Based on attending the role model lectures, please indicate whether you: (1) Strongly Disagree (2) Disagree (3) Neither Agree nor Disagree (4) Agree (5) Strongly Agree with each of the following statements.**

Now I would value being my own boss more than before attending these lectures

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

Now I would value being financially independent more than before attending these lectures

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

I would get self-satisfaction from starting a successful business from hearing these role models

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

I admire these role models and what they have achieved

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree



### Post Talk Entrepreneurship Lecture Series Pilot

**Based on attending the role model lectures, please indicate whether you: (1) Strongly Disagree (2) Disagree (3) Neither Agree nor Disagree (4) Agree (5) Strongly Agree with each of the following statements.**

I would value being an entrepreneur more now than before

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

I have realised new rewards of being an entrepreneur

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

I would like to have the same rewards from a successful business as these entrepreneurs

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree



### Post Talk Entrepreneurship Lecture Series Pilot

**Based on attending the role model lectures, please indicate whether you: (1) Strongly Disagree (2) Disagree (3) Neither Agree nor Disagree (4) Agree (5) Strongly Agree with each of the following statements.**

I would keep my options open and would consider starting a business in the future

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

I will attend more entrepreneurial talks in the future to gain additional knowledge

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

If I come up with a new idea I would now be more likely to investigate starting a new business

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

Prior to these talks I did not have any plans to start a business in the future. These entrepreneurial talks have made me reconsider my options and I would consider starting a new business in the future.

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

These entrepreneurial talks have motivated me to consider entrepreneurship in the future

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

## **Preface to paper 4 – Findings & discussion**

The ‘Findings and Discussion’ paper (Paper 4) was developed between May 2019 and March 2020. Due to COVID 19 restrictions, the normal examination process could not take place and instead the examiners carried out a desktop review. Feedback was then sent to the researcher. The final recommended version of the paper included in this thesis was submitted following amendments based upon examiner commentary.

Following a discussion with the research supervisors, it was agreed to revisit the research question before analysing the data. This would be crucial when undertaking the thematic analysis. The research question was modified from;

*Can role models increase students’ entrepreneurial intent by increasing confidence in their entrepreneurial competencies and by highlighting the rewards of entrepreneurial success?*

to

*Can role models increase students’ entrepreneurial intent by increasing their expectancy of entrepreneurial success and/or by highlighting the rewards of entrepreneurial success?*

The research question was now more open and enabled the researcher to explore how expectancy was increased without pre-assuming it was due to “*increasing confidence in their entrepreneurial competencies*”. If this was the case, it would show in the thematic analysis, which it did.

The ‘Design & Initial Findings’ paper (Paper 3) introduced how the researcher developed the quantitative questionnaire to examine the influence that the role models had on entrepreneurial intent. Five hypotheses were introduced. Following the pilot study, completed by 35 students, a factor analysis was then performed on the data. When the scale variables are normally distributed, ordinary least-squares (OLS) linear regression is the best suited factor analysis model (Alma, 2011). The major weakness of OLS is its sensitivity to multi-collinearity. “Multicollinearity exists whenever an independent variable is highly correlated with one or more of the other independent variables in a multiple regression equation” (Allen, 1997, p.176).



Multicollinearity is an issue because it weakens the statistical significance of an independent variable. Following a review of the data, Pearson's correlation was calculated, and it was found that multi-collinearity existed between the two variables relating to entrepreneurial barriers (variables relating to H<sub>2</sub> and H<sub>3</sub>) and two variables relating to value (variables relating to H<sub>3</sub> and H<sub>4</sub>). The variable items were looked at and items that showed multi-collinearity were modified and combined and the model retested using the same data to ensure multi-collinearity no longer existed. Following the factor analysis, these five variables were reduced to three. The hypotheses, therefore, were modified and are summarised as follows:

Summary of hypotheses:

*H<sub>1</sub>: Through internalisation, role models reinforce the confidence of achieving success, influencing expectancy, and in turn significantly impacting entrepreneurial intent.*

*H<sub>2</sub>: Role models change perceived barriers, influencing expectancy, and in turn significantly impacting entrepreneurial intent.*

*H<sub>3</sub>: Role models change the perceived desirability of entrepreneurship influencing value, and in turn significantly impacting entrepreneurial intent.*

The researcher reflected that after the significant work involved in organising the role model lectures, collecting the data, and then analysing the data, there was a great sense of satisfaction when students reflected on the positive influences the role models had on their entrepreneurial intent. This paper was at an exciting stage of the research process as themes began to emerge from the data. Approximately 70% of students indicated the positive influence that the role model talks had on their entrepreneurial intent.

The researcher also reflected on their positivist philosophical position and the strong emphasis placed on the qualitative data in this study. The 6-phase procedure outlined in Braun and Clarke's (2006) thematic analysis gave the researcher more confidence when analysing the qualitative data. Braun and Clarke's (2006) thematic analysis has been cited more than 90,000 times since its publication. By using this structured approach, the researcher was confident that generalisable conclusions could be made about the influence that the role models had on students' entrepreneurial intent and that these conclusions could support a practical prediction of future events.

On closer reflection, the questions in Thompson's (2009) IEIS may be more suited to business students. Questions such as "Are you saving money to start a business", and "do you read books on how to set up a firm" may not be as suitable for science and engineering students and may therefore make the results less generalisable. A more applicable scale may be Lüthje and Franke's (2002, 2003) entrepreneurial intent scale that examines both expectancy and intentions. The scale has been tested on a sample population of 470 Sloan School of Management at Massachusetts Institute of Technology (MIT) (Lüthje & Franke, 2002) and 512 MIT engineering students (Lüthje & Franke, 2003). The scale showed good validity and reliability and may be more suited to future studies as it has been tested across disciplines and therefore results may be more generalizable. The 'Findings and discussion' (Paper 4) will now follow.

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**Paper 4:**  
**Findings &**  
**Discussion**

**Examination Date:**  
**23/04/2020**

Student Name: Paul Keane 20077332

Supervisors: Dr. Cormac O' Keeffe and Prof. Bill O' Gorman

Date: 14/04/20

**RESEARCH PAPER SERIES**

**Paper 4:**

**FINDINGS AND DISCUSSION**

**“A framework for the utilisation of role modelling intervention for the promotion of entrepreneurship as an alternative career path.”**

## ABSTRACT

This paper presents the findings of a mixed-methods research design used to examine if there is a link between role model influence and entrepreneurial intent. This research is undertaken as part of a larger doctoral research study by applying mixed-methods research in the researcher's own Higher Education Institute (HEI) organisation. The research examines how entrepreneurial role models can be used to motivate students to consider entrepreneurship as a career. The unit of observation for this research study is students' entrepreneurial perceptions. Eighty-two third year Biomedical and Mechanical Engineering students (male = 73, Female = 9) with an average age of 22.7 years (SD =3.3) consented to participate in the study. The study consisted of an initial investigation phase, a series of lectures by five entrepreneurs (role model intervention), and an evaluation phase to determine the effectiveness of the lectures. The lectures were given by entrepreneurs at different stages of their entrepreneurial journeys from fields such as construction, financial services, biomedical devices, and agricultural technology sectors. They discussed how they overcame barriers in setting up and growing their enterprises, the rewards of entrepreneurship, how they valued those rewards, how they failed and successfully started other businesses, and the lessons they learnt on their journeys.

A thematic analysis of post-lecture student reflection was performed. Three general dimensions were identified: expectancy of entrepreneurial success, value of entrepreneurial success, and the effectiveness of the role model intervention. The effectiveness of the intervention was shown to have positive results with approximately a quarter of all students indicating positive intent and approximately 70% of students indicating the positive influence that the entrepreneurship (role model) talks had on their intent. A quantitative analysis of the evaluation phase data concluded that role model interventions focusing on the value of entrepreneurship had approximately twice the influence on intent than interventions focusing on expectancy. The results and findings from the study were then interpreted, analysed, and evaluated with regard to the conceptual framework, existing theory, and the previous empirical findings.

**Paper Word Count:** 9,135

## 1. Introduction and plan of the paper

Empirical studies loosely suggest a positive influence of role models on the decision to become an entrepreneur but a link between role model influence and entrepreneurial intent is inconclusive leading to the research question:

*Can role models increase students' entrepreneurial intent by increasing their expectancy of entrepreneurial success and/or by highlighting the rewards of entrepreneurial success?*

The mixed-methods research design, incorporates 4 phases; conceptualising the research (phase 1), an initial investigation (phase 2), an intervention i.e. an entrepreneurship lecture series (phase 3), and an evaluation of results phase (phase 4). The investigation phase was used in the first instance to gauge the students' initial entrepreneurial intent, collect data on the role models in the students' networks, and to gather information on students' attitudes to entrepreneurship. The evaluation of results phase was commenced after the five entrepreneurship talks. Students completed a quantitative survey and a qualitative reflection. Braun and Clarke's (2006) thematic analysis was used for the qualitative data analysis and initial findings presented. Finally, entrepreneurial intent was again measured so that it could be compared with the investigation phase intent. The data allowed for a quantitative study to test the "a series of hypotheses (detailed in the design paper, Paper 3, of this research series) and develop an initial regression formula for the effectiveness of role models on influencing entrepreneurial intent.

Section 2 of this paper gives an overview of the research design and outlines the practical methods undertaken in the data collection and the entrepreneurship lectures. Section 3 presents the initial investigation stage findings including the students' entrepreneurial intent using Thompson's (2009) individual entrepreneurial intent scale (IEIS). The five entrepreneurs and their different entrepreneurial stages and demographics are also presented. Section 4 presents the findings of the qualitative data analysis (QDA) utilising thematic analysis (Braun & Clarke, 2006). Section 5 completes the analysis of this mixed-methods design by presenting the evaluation stage IEIS results, analysing the reliability and validity of the quantitative data, and presenting the results of the regression analysis. Section 6 discusses Thompson's (2009) IEIS and queries its application for measuring student entrepreneurial intent. Section 7 concludes the paper and outlines the next stages of this study.

## 2. Overview of research design

Before commencing the study, both the supervising institute, Waterford Institute of Technology (WIT), and the host institute, Cork Institute of Technology (CIT), gave approval for the research procedure. The students were currently in the 4th year of a four-year Honours degree or a five-year Masters degree in Mechanical Engineering and Biomedical Engineering. Every student completed a written informed-consent form prior to taking part in the study. All students were anonymised but a unique identifier allowed the researcher to compare data for each individual student at different stages of the study. This allowed for a further level of investigation and analysis. Students had to attend the entrepreneurship lectures as part of their core module “Engineering Management” but participation in the study was entirely voluntary. All 82 fourth year Biomedical and Mechanical Engineering students (male = 73, Female = 9) with an average age of 22.7 years (SD =3.3) consented to participate in the study.

The mixed-methods research design, incorporates 4 phases; conceptualising the research, an initial investigation, an intervention i.e. an entrepreneurship lecture series, and an evaluation of results phase. Figure 1 presents a graphical representation of the 4-phase mixed-methods design and Figure 2 outlines the timeline for the study. Phase 1, conceptualising the research, has already been completed and is discussed in the conceptual paper, Paper 1, of this research series. As part of the research design a pilot study was conducted to test the data collection instruments. A total of 95 respondents completed the investigation stage pilot questionnaire and 35 respondents completed the evaluation stage pilot questionnaire. Based on the outcome of the pilot study the data collection instruments were modified and finalised. Data was collected over the first semester of academic year 2019/2020. A semester consists of 12 weeks and collecting the data over a limited period reduced the impact of extraneous variables.



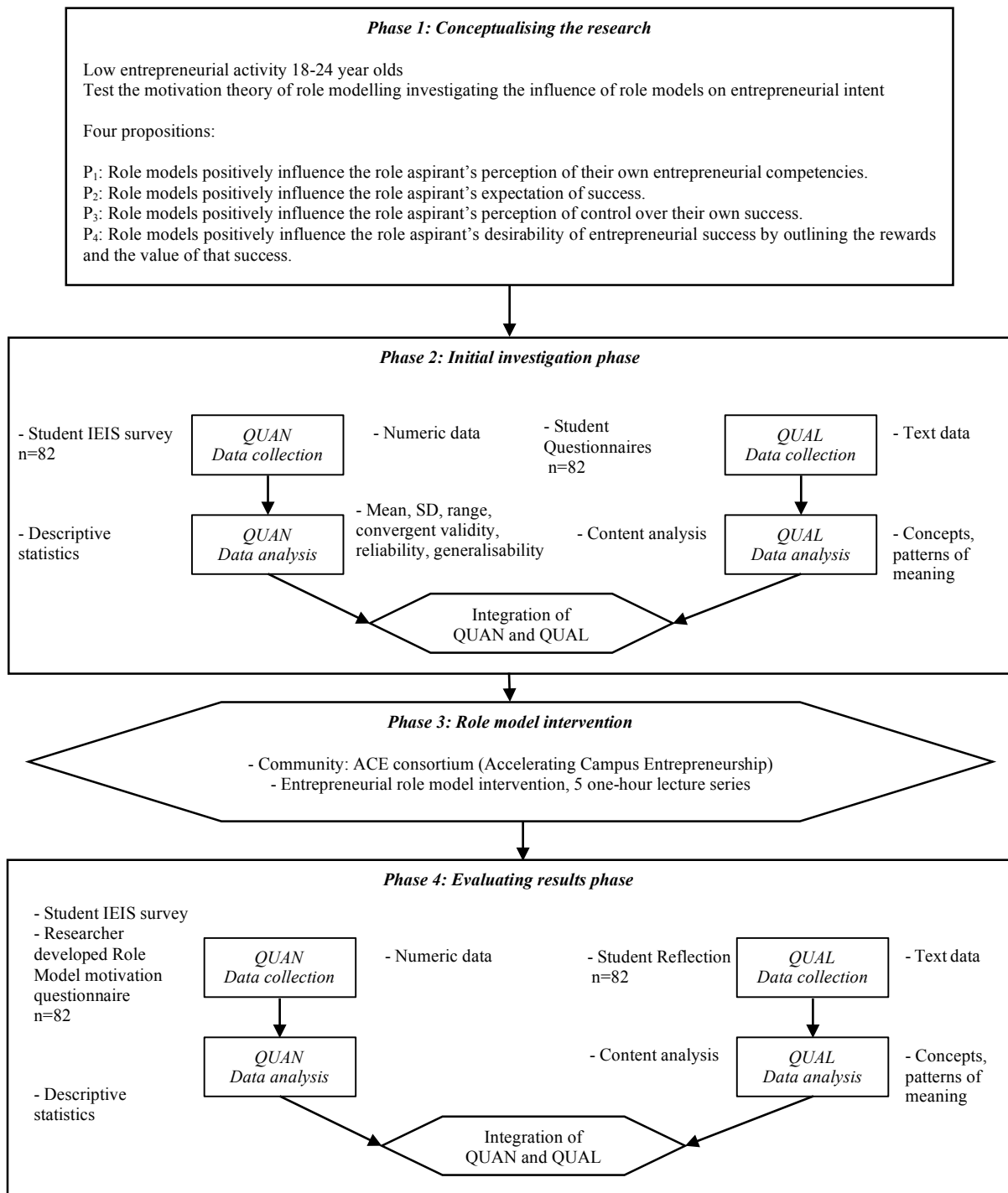


Figure 1: 4 phase mixed-methods design (source: current research)

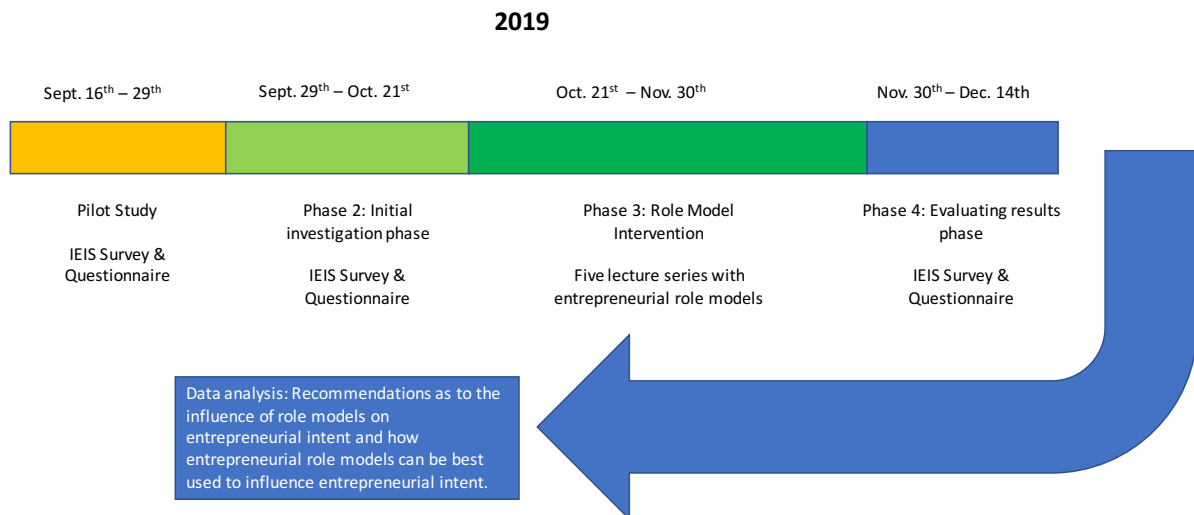


Figure 2: Research timeline of the data collection, semester 1, 2019 (source: current research)

A quantitative and qualitative investigation survey was developed and distributed using Survey Monkey as seen in Appendix A (phase 2). Entrepreneurs were recruited with the assistance of the ACE group (Accelerating Campus Entrepreneurship) in CIT. The entrepreneurship lectures were approximately one hour in duration and students were asked to attend a minimum of four out of the five lectures (phase 3). A question and answers session concluded each lecture. A quantitative evaluation survey was developed and distributed using Survey Monkey as seen in Appendix B. Students were also asked to complete a reflection of approximately 1,000 words on their learning and observations from the entrepreneurship lectures (phase 4). The data was then analysed using SPSS for the quantitative data and Nvivo for the qualitative data.

### 3.0 Initial investigation phase findings (phase 2) and role model identification (phase 3)

All 82 students completed the investigation stage questionnaire using Survey Monkey (Appendix A). Students' initial entrepreneurial intent was measured using Thompson's (2009) IEIS (scale 1 "very untrue" - 6 "very true") with an initial intent of 2.83 (SD = .944), indicating that their intent to become an entrepreneur was 'slightly untrue' based on the Likert scale used. The scale's Cronbach's alpha coefficient of internal reliability was calculated to be 0.744, hence, the scale seemed to have acceptable internal reliability. The contribution of individual items to overall internal reliability was checked and found to be positive in each case, with the average corrected item-total correlation being 0.489. It can be concluded that the components

of the scale are sufficiently inter-correlated and the grouped items measure the underlying variable (Sullivan & Artino, 2013).

The implementation of the entrepreneurship lectures had to be completed within a twelve-week semester so an empirical initial analysis of the investigation questionnaire was performed. The initial observations are presented in Table 1.

<b>Initial observations</b>	<b>% of Students</b>
At least one entrepreneurial role model in their network	75
At least one family role model in their network	47
Both a family and on-family role model in their network	29
Family role model had a positive influence on entrepreneurship	67
Family role model had a negative influence on entrepreneurship	5
Non-Family role model had a positive influence on entrepreneurship	46
Non-Family role model had a negative influence on entrepreneurship	6
Finance the greatest barrier to entrepreneurship	62
Financial gain the reward valued most	36

Table 1: Initial observations from investigation phase survey

As summarised by Bosma et al. (2012), the decision to become an entrepreneur is related to the availability of role models. A region with high levels of entrepreneurship may further encourage new entrepreneurial initiatives because it is easier to find an appropriate example or obtain information or resources from other entrepreneurs. Five role models were recruited with the assistance of the ACE group in CIT. A pragmatic approach was taken with the aim to provide variety and to give students a very broad perspective of start-ups from early stages to more experienced entrepreneurs.

Entrepreneurs were asked to discuss their entrepreneurial journey, the values of entrepreneurship, and the barriers to entrepreneurship. Based on the outcome of the initial investigation phase the entrepreneurs were asked to focus on how they overcame financial barriers and to discuss their own entrepreneurial rewards and how they value those rewards.

The five entrepreneurs recruited were;

*Role Model A* is CEO of an enterprise producing construction products for passive houses. A Male in his 50s who went from one failed business to become a successful entrepreneur, making his product in his own garage to developing his own production facility. The company was originally funded by Enterprise Ireland's New Frontiers entrepreneur development programme and he was now successfully producing and selling his product.

*Role Model B* is CEO of a financial services IT start-up. A female in her 40s based in CIT's incubation centre. She started her company ten years ago and the company is now an Enterprise Ireland High Potential Start Up (HPSU). The company is backed by an Irish venture capitalist and most recently merged with a Finnish financial services company.

*Role Model C* is CEO of an agricultural technology start-up. A male in his 20s, he recently graduated as a Mechanical and Electrical engineer and having gained full time employment in a large multinational, decided to leave his job to start his own business. His product aims to increase economic efficiency within the livestock industry, while minimising the environmental impact of beef production. He initially completed a student entrepreneurship programme and is now in Phase 2, Enterprise Ireland, New Frontiers start-up.

*Role Model D* is CEO of a medical device start-up. A female in her 30s, started her company without any prior entrepreneurial knowledge, and was a recent winner of the Irish Medical Device Association (IMDA) awards. With the support of the CIT college incubation centre, she has filed multiple patents and acquired millions in start-up funding. Her product is at the final stages of FDA approval.

*Role Mode E* is CEO of a cleanroom validation, commissioning and compliance start-up. A male in his 40s. His company provides a range of services to the pharmaceutical, medical devices and healthcare sectors. He is also a serial entrepreneur and has acquired many start-ups to complement his business.

#### 4. Qualitative data analysis (Phase 2 and Phase 4 data)

Grounded theory, content analysis, discourse analysis, narrative analysis, case study, thematic analysis, and interpretive phenomenological analysis were researched in order to rationalise the selection of a qualitative data analysis (QDA) method for this research study. A recognised data analysis methodology allows the researcher to follow a tried and tested process, supported by literature, that will offer an audit trail to the process undertaken. Thematic analysis (Braun & Clarke, 2006) involves identifying, analysing, and reporting themes and is one of the most commonly used data analysis methodologies (Guest et al., 2011; Thomas & Harden, 2008). The process aligns best with the researcher’s positivist underpinnings. Thematic analysis is a method of analysis that is systematic and transparent.

“Thematic analysis is a method for identifying, analysing, and reporting patterns (themes) within data. It minimally organises and describes your data in (rich) detail. However frequently it goes further than this, and interprets various aspects of the research topics” (Braun & Clarke, 2006, p.79). Braun and Clarke (2006) outline a 6-phase procedure shown in Table 2.

Phase	Examples of procedure for each step
1. Familiarising oneself with the data	Organising data; reading and re-reading; noting down initial codes
2. Generating initial codes	Coding interesting features of the data in a systematic fashion across the data-set, collating data relevant to each code
3. Searching for themes	Collating codes into potential themes, gathering all data relevant to each potential theme
4. Involved reviewing the themes	Checking if the themes work in relation to the coded extracts and the entire data-set; generate a thematic “map”
5. Defining and naming themes	Ongoing analysis to refine the specifics of each theme; generation of clear names for each theme
6. Producing the report	Final opportunity for analysis selecting appropriate extracts; discussion of the analysis; relate back to research question or literature’ produce report

Table 2: Six-step thematic analysis procedure (source: Braun & Clarke, 2006, p.94)

Thematic analysis was applied to both the phase 2 data and phase 4 data. Phase 2 data gave an indication to both family and non-family role models within the students’ personal network and the influence on their attitudes to entrepreneurship. The data also included information on

their perception of the values of entrepreneurships and the barriers they would need to overcome. Eighty-two phase 2 surveys were collected with one individual reflection piece on values and barriers from each participant (ranging from a minimum of 1 word to a maximum of 30 words and an average of 5 words per reflection). The phase 4 qualitative data included student reflections of approximately 1,000 words where the students reflected on the lectures they attended. When selecting data themes for discussion a pragmatic approach was taken. A pareto analysis was performed on the number of individuals that referenced a particular theme, the number of total references for each theme, and the total percentage coverage for each theme. On completion it was found that approximately thirty percent of the themes covered eighty percent of the total coverage. Other themes considered for discussion were unique and interesting themes, themes that were in line with the literature, or themes that contradicted the literature.

The 1st phase of the thematic analysis process involved reading and re-reading the investigation phase data (collected from the questionnaire, phase 2 data) and evaluation phase data (collected from the questionnaire and the student reflections, phase 4 data) and then noting initial codes. Phase 2 used Nvivo QDA software to analyse the data in a systematic fashion, collating data relevant to each code. After applying initial coding to the data 110 raw data themes were identified relating to the students' experience of the entrepreneurship lectures (See Appendix C). The codes were then collated into twelve first order themes and the themes were checked in relation to the coded extracts by reanalysing the entire data-set (See Appendix D). Following a refinement of each theme and the identification of first-order themes (n=11) and in some cases second-order themes (n=7) three general dimensions were identified: expectancy of entrepreneurial success, value of success, and the effectiveness of the role model intervention (see Appendix E). These themes can be linked back to the four propositions originally presented in the conceptual paper, Paper 1, of this research series;

P1: Role models positively influence the role aspirant's perception of their own entrepreneurial competencies.

P2: Role models positively influence the role aspirant's expectation of success.

P3: Role models positively influence the role aspirant's perception of control over their own success.

P4: Role models positively influence the role aspirant's desirability of entrepreneurial success by outlining the rewards and the value of that success.

Based on the expectancy-value theory of motivation, individuals will be more inclined to take up entrepreneurship as an alternative career path if the perception of their entrepreneurial competencies increases (P1), if they expect success (P2), and if they sense that they have control over their own success (P3); i.e. expectancy dimension. Individuals will be more inclined to take up entrepreneurship as an alternative career path if they value the rewards of that success (P4); i.e. value dimension. Finally, the effectiveness of the role model intervention dimension will investigate the overall effectiveness of the intervention; i.e. effectiveness dimension.

#### **4.1 Expectancy of entrepreneurial success**

Eccles and Wigfield (2002, p.119) define expectancies for success as "individuals' beliefs about how well they will do on upcoming tasks, either in the immediate or longer-term future." They define beliefs as individuals' evaluations of their competence in different areas. Three first order themes were identified; increased expectancy, insight gained, and overcoming barriers. Figure 3 gives a graphical representation from the thematic analysis of the flow of 20 raw themes to three first order themes linking to the general dimension expectancy. Evidence suggests that role models help to increase expectancy of success by increasing the role aspirants' confidence in their own personality traits and skills, by increasing their knowledge of what is involved in entrepreneurship and by showing how barriers can be overcome.

Approximately a quarter of students (23 individual reflections, 34 references) indicated an increase in confidence in their own skills and now perceived entrepreneurial success more achievable. One student stated; *"After listening to each speaker talk about their background, it has given me more belief that I myself have the ability and opportunity to become an entrepreneur. Something I would never have thought of before listening to the guest speaking entrepreneurs."* Another student reflected that *"From listening to [role model A, B, C, and D] who were the four entrepreneurs that I went to, I feel more confident that if I were to start a business that it would be a success. From listening to them, they each had their own unique story as to the obstacles that they had to overcome and how long it took them to get to where they are"*

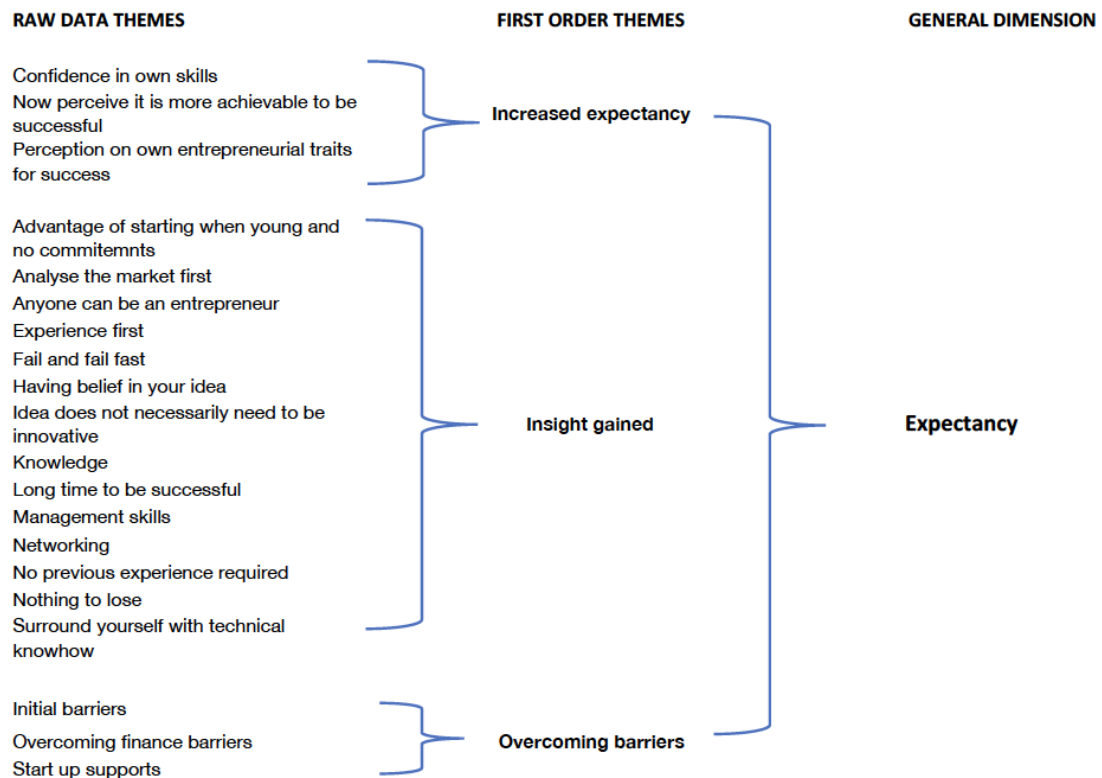


Figure 3: Expectancy dimension of role model lectures (source: current research)

Students discussed the knowledge and insights gained from the entrepreneurship lectures in particular around the areas of marketing, networking and management. Entrepreneurial literature commonly discusses business knowledge and work experience as antecedents for entrepreneurial success (Robinson & Sexton, 1994; Unger et al., 2011) and although students commonly indicated that they would first seek experience before commencing a business, many commented on the advantages of starting a business before taking on additional life commitments;

*“At this stage, my view of entrepreneurship had completely changed as all the speakers so far said you should do it while you were young and could take the risks without people depending on you”*

Another common insight from the entrepreneurial talks was the concept mentioned by two of the entrepreneurs (role model A and B), “fail and fail fast”. This had an effect on one of the student respondents as follows:



*“A phrase that has stuck with me since the first lecture from [role model A] is ‘fail quickly if you are going to fail’. This resonated with me as it highlights the essence of a good entrepreneur. There is no point in spending time and money on an idea that is not going to be successful.”*

This idea was reflected on by approximately half of the participants (40 individual reflections, 49 references) suggesting it resonated with the students. Role model A discussed how he dealt with entrepreneurial failure and recovered to start a successful business. He used the term “fail and fail fast” and discussed the concept that if an idea is not a good one it is better for it to fail before you exert more time and resources into a bad idea. This suggestion was again strengthened in the second lecture where role model B discussed the problems associated with spending many years working on a poor idea. As an entrepreneur with ten years’ entrepreneurial experience, she was able to discuss in detail how her business model continually changed as she realised failings along the way.

As outlined in the investigation phase findings, 62% of students indicated that finance was the greatest barrier to starting a business. This was a key input for the role model lectures and role models were asked to discuss overcoming financial barriers and start-up supports. Approximately half of the students (35 individual reflections, 48 references) reflected on a new found understanding of the finances and supports available; for example one student reflected:

*“One thing that I learned from the entrepreneurs is the amount of help that there is available. This help may be in the form of financial aid or advice from people who set up business. Financial aid can be applied for and provided from either angel investors or by acquiring certain grants which are available from Enterprise Ireland. There is also a wide range of mentors available that want to help enterprises succeed. One place where this mentorship is available is in the Rubicon Centre which is located in Co. Cork. Previously I was naively under the impression that entrepreneurs worked on their own with little help as I was unaware of the different types of help available.”*

## **4.2 Value**

Two first order themes were identified from the thematic analysis as outlined in Figure 4 i.e. ‘value of entrepreneurship’ and the ‘value of full-time employment’. Prior to the lectures

(phase 2 data) approximately one-third of the students indicated that finance was the entrepreneurial reward that they valued most, another third mentioned a sense of achievement, and a third declared being their own boss as what they valued most. Following the lectures a quarter of all students (20 individual reflections, 29 references) mentioned financial rewards but a significant shift was seen towards intrinsic values such as achievement motivation, 'being your own boss', and time flexibility as being most valued. Forty-one students reflected (41 individual reflections, 56 references) that achievement motivation was a key entrepreneurial reward that they valued i.e. the desire to achieve via one's abilities and efforts to experience the enhanced self-esteem from the achievement (Miner, 1993).

*According to one respondent, "The personal reward of starting a business and developing a product is also another significant reward from being an entrepreneur. The personal achievement from this is very significant and is very appealing to me."*

Being your own boss (41 individual reflections, 50 references) and the reward of time flexibility (34 individual reflections, 44 references) were a common theme in the student reflections. Two role models, role model A and role model E dedicated a lot of time to discussing one of their most valued rewards, time flexibility, and this resonated with students.

*"These rewards would sway me towards delving into entrepreneurship at some point in the future. I love the idea of working on an idea that I came up with and having the freedom to be my own boss. It would be of huge benefit having no boss as it would give you far more power over your own lifestyle. [Role model A] gave an example of how one day his daughter was sick and had to be taken to the doctors, but he had the power to drop everything he was doing and reschedule his week so he could take her. These speeches would prompt me into entrepreneurship as having complete job satisfaction would be a massive step towards having a happier life."*

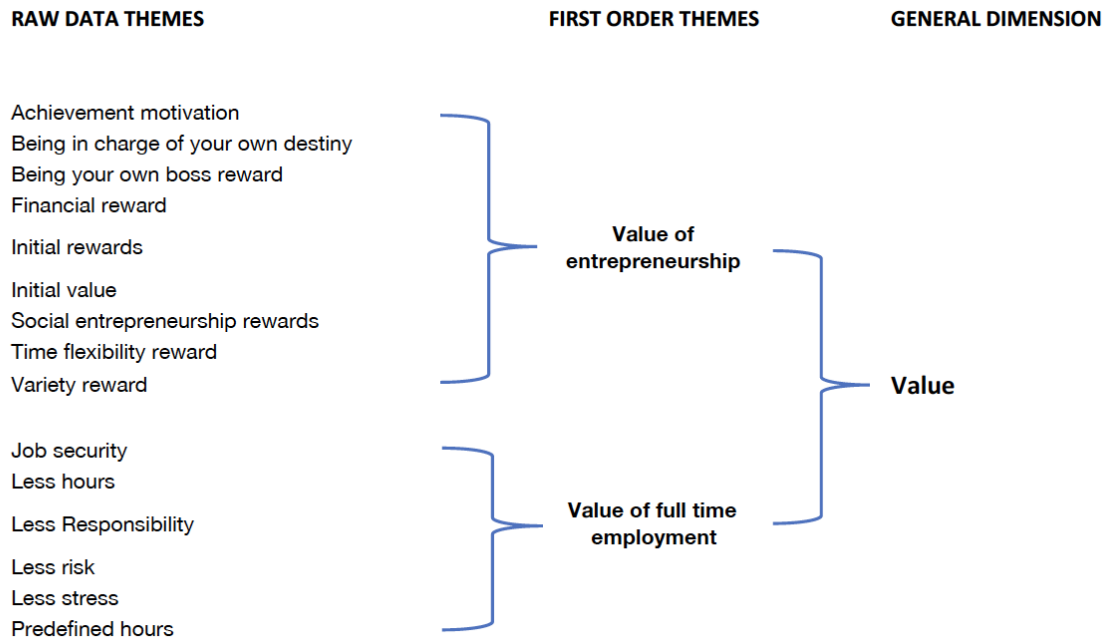


Figure 4: Value dimension of role model lectures (source: current research)

One new-found reward that students indicated had an intrinsic value was the social entrepreneurship reward i.e. the reward of benefiting society (17 individual reflections, 19 references). The reflections related in particular to the lecture given by role model D, a female CEO in her 30s who started her company without any prior entrepreneurial knowledge. Her company’s product replaces the requirement to put children under full anaesthetic in hospital conditions allowing for procedures to be carried out in a general practitioner’s premises. The improvement to a child’s health and well-being and a reduction in their pain experience, resounded with these students;

*“I was impressed with [role model D’s] device in terms of helping children through what can be a terrible time for them. Having nieces and nephews myself, two of them have this procedure and they did not like the process leading up to it and afterwards. Procedures such as that can be a stressful time for children. Her product drastically eases the entire procedure for both parent, the child and the clinician. She takes away the additional fact that she is also helping people which leads to its own satisfaction.”*

Cost is related to the negative aspects of choosing entrepreneurship, i.e. will I be able to perform the task, will I fail or succeed, how much effort will it require and what are the lost opportunities of me making this choice? Subsequently, the choice they make depends on the

relative value and probability. It is evident from the QDA that students are comparing the negative aspects associated with entrepreneurship versus the security and certainty associated with regular employment. It is also evident from the analysis that students reflected more on the value of entrepreneurship (214 references) versus full time employment (31 references). As one student stated:

*“My dream job is a job where I show up at my designated hours, work hard, go home and not have to think for a second about my job until I return the following day and then at the end of the month get a pay check. Some might call this boring but to me it sounds perfect, as it allows ample opportunity and time to pursue other interests in life other than work.”*

The value of full time employment generally indicated that students rejected entrepreneurship due to the long hours required; according to respondents, *“Starting a business will require 60 to 80 hour weeks at the beginning, and I believe that the idea of having freedom in life and also money can only go so far as motivators when you have to put in hours that extreme”*; as regards the risks, *“I still have some doubts that there are many risks out there for entrepreneurs even if you get past the initially financial issues”*; and as for the stress involved *“I think it would be too stressful and I do not know enough about running businesses”*.

### **4.3 Effectiveness of role model intervention**

Figure 5 shows the raw themes, first order themes, and second order themes associated with the effectiveness dimension. This dimension differs from the expectancy and value dimensions as it has both first order themes and second order themes. This was a result of a large number of reflections (1214 reflections) in comparison to expectancy (432 reflections) and value (421 reflections). Therefore, three second order themes were identified; motivation, role model attributes, and perception of the role model. All three themes are a direct measure of the effectiveness of the role model intervention.

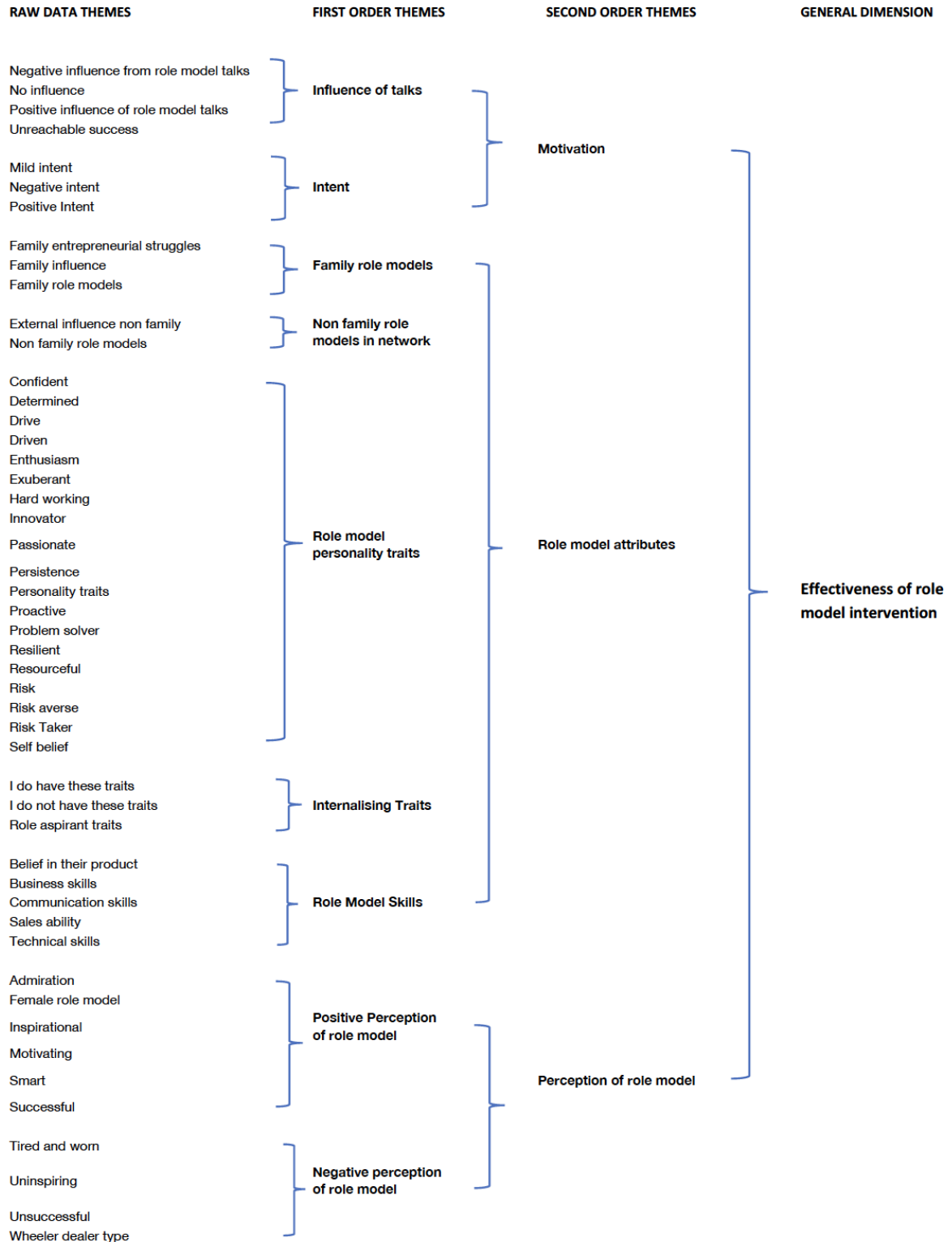


Figure 5: Effectiveness dimension of role model lectures (source: current research)

Starting a business is positively correlated with having parents who are or were entrepreneurs (Chlosta et al., 2012; Hoffmann et al., 2015). As summarised by Bosma et al. (2012), the decision to become an entrepreneur is related to the availability of role models. Prior to the role model lectures (phase 2 data) students were questioned on family role models and role models within their network. Seventy-five percent of students had at least one entrepreneurial role model in their network. Forty-seven percent of students had a family role model. Twenty-nine percent of students had both a family role model and a non-family role model in their network.

According to Morgenroth et al. (2015) admiration and internalisation of role model qualities influences the desirability of entrepreneurial success and the effectiveness of the intervention. Two entrepreneurs that stood out in terms of admiration (thematic sequence: admiration/ positive perception of the role model/ perception of the role model/ effectiveness) were role model A and role model C. Students indicated a positive perception towards the entrepreneurs with 183 positive references to admiration, inspiration, motivation and successfulness. Students indicated admiration for the role models (60 individual reflections, 88 references); according to one student, *“I admire how he remains positive, keeps on trying and still works towards fulfilling all of his dreams. It gives me reassurance that I can also become a successful entrepreneur”*. Negative perceptions were less evident with 18 references relating to a lack of inspiration and a lack of success.

Students’ perception of role models within their own network must also be considered as these students have a reference point on which to gauge the entrepreneurs participating in the lectures. Prior to the lectures (phase 2 data) approximately 60% of students indicated that their family role model had a positive influence on them considering entrepreneurship in the future. One student discussed their positive family influence; *“Seeing my aunt being so passionate and engrossed in her business has given me a positive outlook on entrepreneurship”*. Five percent indicate the negative influence that a family role model had with another student stating; *“Becoming an entrepreneur is not something I desire. While I can see many benefits to starting your own business it also can be a stressful and time consuming decision. It can be difficult to separate private life from work life.”*, was the comment from another student. Forty-six percent of respondents indicated that non-family role models had positive influence on them considering entrepreneurship with six percent indicating a negative influence (phase 2 data).

Gibson (2004) discussed how when a role aspirant perceives a role model to be similar to themselves, their desire to be like that person increases by emulating those attributes. Students discussed the personality traits that they associated with the role models. One individual referred to her admiration for role model D due to her being a female role model *“Role Model D was the entrepreneur I admired the most over the course of the five talks. In my opinion this was due to her being a female role model in the biomedical sector.”*

Most prominently students referred to the entrepreneurs as being *“hard working”* and *“passionate”*. References relating to internalisation of role model qualities (thematic sequence: internalising traits/ role model attributes/ effectiveness) were identified (65 individual reflections, 91 references). The majority of these references related to role model B, an engineer who left full-time employment in a large multinational enterprise to start his own business. A common reference was to him talking about being stuck on a bus and wanting to get off; as one student said, *“He described working at [a multinational enterprise] as like ‘being stuck on a bus in a traffic jam’, when all he wanted to do was to get off the bus and run. Upon hearing this I knew exactly how he felt, as I felt similar during my work placement”*.

An attribute that students referred to and identified with was that of being risk averse (thematic sequence: risk averse/ role model personality traits/ role model attributes/ effectiveness; 7 individual reflections, 14 references). Students noted their general surprise to this trait having expected entrepreneurs to be risk takers; as one surprised student said, *“The entrepreneur I feel I related most to was [role model E]. I found him to have a very interesting career path, and ultimately when asked was he a risk taker, answered no, which is I think like myself in that I would only go down the path of entrepreneurship if I felt the idea or opportunity was a relatively (as far as start-ups go) [low] risk.”*

Approximately a quarter of all students indicated positive entrepreneurial intent (thematic sequence: positive intent/ intent/ motivation / effectiveness; 21 individual reflections, 29 references) and approximately 70% of students (57 individual reflections, 130 references) indicated the direct positive influence (thematic sequence: positive influence of talks/ influence of talks/ motivation / effectiveness) that the role model talks had on their entrepreneurial intent.

As a number of students indicated:

*“I would never have considered becoming an entrepreneur before I attended these talks but my attitude towards this has now changed for a few reasons. Each of the entrepreneurs thought [sic] me not to be afraid of failing.”*

*“I thought the talks were very beneficial for me about entrepreneurship because before the talk I would never have thought about becoming an entrepreneur but when listening to each entrepreneur at different stages of their projects it has changed my mind”*

*“Previous to these presentations I would have never considered starting up my own company but having gained knowledge around the area and learning about other experiences it has been an eye opener that entrepreneurship is a viable career path.”*

A minority of students (14 individual reflections, 22 references) indicated that the lectures had no influence on their entrepreneurial intent; according to one, *“I don’t think these rewards would make me consider entrepreneurship at some point in my future. I don’t like the idea of running my own business from a financial point of view. I think it would be too stressful and too much hard work.”* Approximately 10% of students indicated the negative influence the lectures had on their entrepreneurial intent (8 individual reflections, 11 references) primarily focusing on risk and fear of failure; for example a student posited:

*“this placed him in substantial debt which he, a man in this 40/50’s is now still paying the price for. In my opinion this is a prime example of the very reason why becoming a young entrepreneur does not appeal to me. I believe his lack of experience as a young entrepreneur put his whole life in jeopardy and had he applied his skills working for another company he could be in a very different, more comfortable managerial role today”*

#### **4.4 Key findings from qualitative data analysis**

The qualitative data analysis indicates that that the role model intervention had a positive influence on students considering entrepreneurship in the future with approximately a quarter of all students indicating positive entrepreneurial intent and approximately 70% of students indicating the direct positive influence that the role model talks had on their entrepreneurial



intent. Initial findings suggest that an increased confidence in students' skills, an increased perception that entrepreneurial success is achievable, and a greater understanding of the supports available, all contributed to an increase in expectancy. The analysis found a change in attitude towards intrinsic values with achievement motivation, 'being your own boss', and time flexibility being the most valued entrepreneurship rewards. One new-found reward that students indicated had an intrinsic value was the social entrepreneurship reward i.e. the reward of benefiting society. Students were found to be making a more calculated decision between a traditional career and entrepreneurship.

Findings from the qualitative data indicate that role model interventions can influence entrepreneurial intent by increasing expectancy of success and the rewards of entrepreneurial success. The discussion section of this research series will discuss these findings by reference to the literature and the underlying theory, Morgenroth et al. (2015) "The motivational theory of role modelling".

## **5. Evaluation phase (phase 4) quantitative analysis**

"Mixed-methods research designs allow researchers to obtain different but complementary data on the same topic" (Morse, 1991, p. 122). Ideally, equal weighting is given to both collection mechanisms but practically the priority may be given to either the quantitative or qualitative approach. Normally, the results are integrated at the interpretation phase (Creswell et al., 2003). This interpretation may conclude the convergence of findings, strengthening the claims of the research study or alternatively may explain a lack of convergence. For this reason, a quantitative study was performed at the evaluation stage (phase 4) of this study. Quantitative data was collected using Survey Monkey as seen in Appendix B.

### **5.1 Reliability and validity testing of scales**

As discussed in the design paper, Paper 3, of this research series, a number of hypothesis were developed in order to undertake a quantitative study. These hypotheses were based on the four propositions outlined in the study and were converted so that they could be quantitatively tested. Based on the outcome of the evaluation stage pilot study the hypotheses were re-evaluated. It was found that two hypotheses relating to entrepreneurial barriers and two relating

to value were duplications and provided erroneous results in terms of reliability, and validity. The hypotheses, therefore, were modified and combined to reflect this and are summarised as follows:

Summary of hypotheses:

*H<sub>1</sub>: Through internalisation, role models reinforce the confidence of achieving success, influencing expectancy, and in turn significantly impacting entrepreneurial intent.*

*H<sub>2</sub>: Role models change perceived barriers, influencing expectancy, and in turn significantly impacting entrepreneurial intent.*

*H<sub>3</sub>: Role models change the perceived desirability of entrepreneurship influencing value, and in turn significantly impacting entrepreneurial intent.*

Figure 6 shows a graphical representation of the model variables in this study. A scale was developed for each of the four variables and data was collected using the evaluation stage survey as seen in Appendix B.

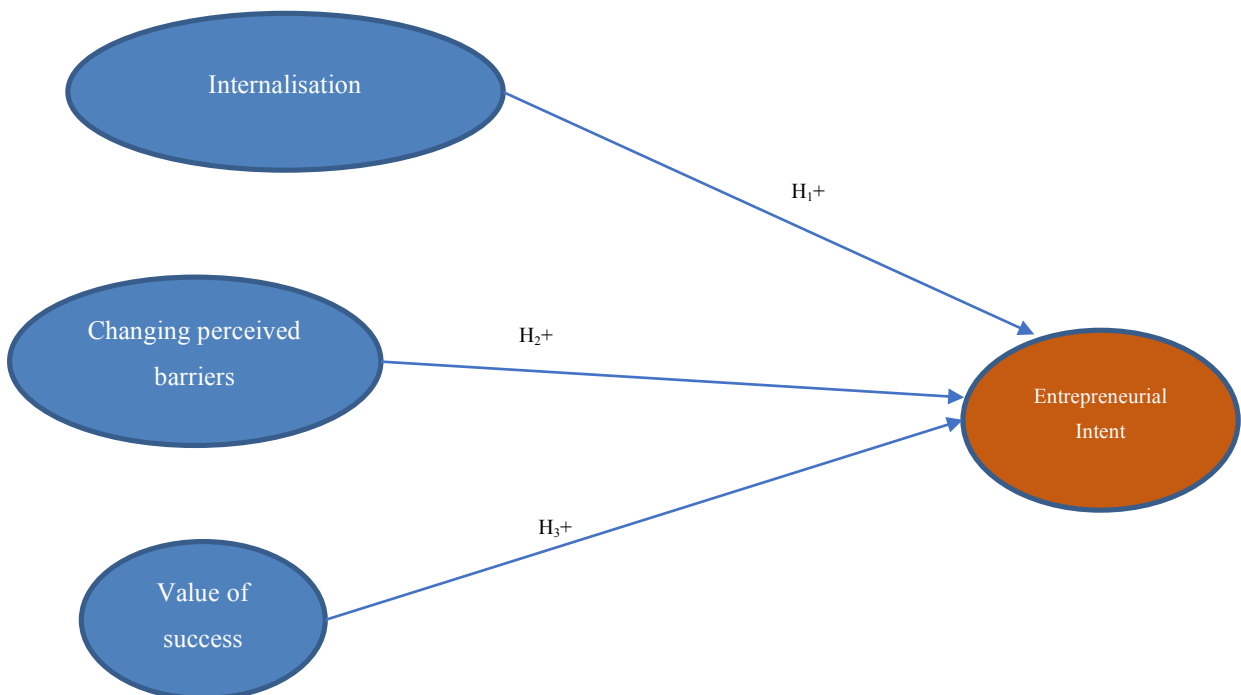


Figure 6: Graphical representation of model variables (source: current research)

First face validity was checked based on a review of the literature. The underlying theory in this study is expectancy-value motivation theory. This theory reasons that the two main factors influencing motivation are the expectations of success and how the perceived rewards of that success are valued (Eccles & Wigfield, 2002). Choices are assumed to be influenced by both negative and positive task characteristics, and all choices are assumed to have costs associated with them precisely because one choice often eliminates other options.

Consequently, the relative value and probability of success of various options are key determinants of choice (Eccles, 1983; Meece et al., 1990). Morgenroth et al. (2015) proposed an extension of the expectancy-value theoretical framework, the motivational theory of role modelling. They emphasised how the power of role models can be utilised to increase role aspirants' motivation, reinforce their existing goals, and facilitate them adopting new goals.

For each scale an internal reliability analysis was performed followed by an EFA (Exploratory Factor Analysis) to test for factor validity. For each variable Cronbach's Alpha was calculated to check acceptability above the recommended cut-off value of 0.60 (Nunnally & Bernstein, 1994). Pearson's correlation coefficient was calculated to check acceptability above the recommended cut-off value of 0.30 (Hair et al., 2006). Factorial validity was checked to ensure one dimension was obtained and factor loadings are above the recommended cut-off value of 0.40 (Hair et al., 2006). If the Cronbach's Alpha criterion was not met, or factor loadings were not above the recommended cut off, then items were deleted (one at a time) to check if reliability and/or validity could be improved. Tables 3 to 6 summarise the reliability and validity testing of the four scales.

**Table 3: Internalisation - Reliability & Factoral Validity Results (source: current research)**

	Cronbach's Alpha	Factor Loading**
1: I think the role models have been successful in starting a business*		
2: I share the same success goals as the role models	<b>0.611</b>	.710
3: I think I have similar qualities to be a successful entrepreneur		.766
4: I share the same work ethic as the role models		.773
* Cronbach Alpha was initially 0.50 and below cut-off of 0.6. One dimension not determined. Item 1 was deleted. Reliability & Factoral Validity tests were repeated for remaining items.		
** One dimension determined. Cronbach Alpha cut-off was met, no item was deleted.		

**Table 4: Reducing barriers - Reliability & Factoral Validity Results (source: current research)**

	Cronbach's Alpha	Factor Loading*
1: The role models have overcome significant barriers to becoming an entrepreneur	<b>0.608</b>	.661
2: I can overcome finance barriers as demonstrated by the role models		.828
3: I can overcome my lack of experience as an entrepreneur as demonstrated by the role models		.749
<b>* One dimension determined Cronbach Alpha cut-off was met, no item was deleted.</b>		

**Table 5: Values - Reliability & Factoral Validity Results (source: current research)**

	Cronbach's Alpha	Factor Loading*
1: I would value being an entrepreneur more now than before	<b>0.642</b>	.847
2: I have realised new rewards of being an entrepreneur		.748
3: I would like to have the same rewards from a successful business as these entrepreneurs		.711
<b>* One dimension determined Cronbach Alpha cut-off was met, no item was deleted.</b>		

**Table 6: Intent - Reliability & Factoral Validity Results (source: current research)**

	Cronbach's Alpha	Factor Loading*
1: I would keep my options open and would consider starting a business in the future	<b>0.785</b>	.799
2: I will attend more entrepreneurial talks in the future to gain additional knowledge		.771
3: If I come up with a new idea I would now be more likely to investigate starting a new business		.727
4: These entrepreneurial talks have made me reconsider my options and I would consider starting a new business in the future.		.535
5: These entrepreneurial talks have motivated me to consider entrepreneurship in the future		.877
<b>* One dimension determined Cronbach Alpha cut-off was met, no item was deleted.</b>		

## 5.2 Regression analysis

Regression analysis explains the relationship between a set of independent variables and a dependant variable. Many regression models are available and their selection depends on the data available and the underlying assumptions of the model. Ordinary least-squares (OLS) linear regression was chosen over other factor analysis/multinomial logistical regression models as the scale variables were normally distributed and the data best suited this regression

model. The primary weaknesses of OLS include sensitivity to outliers and multi-collinearity so these assumptions will be checked to ensure they are within specified limits. Table 7 outlines the mean and interpretation for each variable.

Variable	Mean	Standard Deviation
Entrepreneurial intent	3.49	0.64
Internalisation	3.48	0.59
Barriers	3.94	0.49
Values	3.68	0.60

Table 7: Mean and standard deviations (source: current research)

Pearson's correlation was analysed and it was found that multi-collinearity between the variables does not exist. The null hypothesis is that the independent variable does not significantly influence the dependant variable. On the first regression run it was found that the variable, internalisation, had a p-value of 0.374, greater than the cut-off of 0.05 (Hair et al., 2006). Therefore, the hypothesis  $H_1$  is rejected.

The adjusted  $R^2$  is 0.523, therefore 52.3% of the variation in intent is associated with changes in the independent variables. The model has a good level of fit,  $P < 0.000$ . The t-statistics and its p value for each independent variable were then analysed and the results shown in Table 8.

Variable	t-statistics	p-value
Barriers	3.554	.001
Values	7.189	.000

Table 8: t-statistics and p-value (source: current research)

Based on the findings the following hypotheses are not rejected;

*H<sub>2</sub>: Role models change perceived barriers, influencing expectancy, and in turn significantly impacting entrepreneurial intent.*

*H<sub>3</sub>: Role models change the perceived desirability of entrepreneurship influencing value, and in turn significantly impacting entrepreneurial intent.*

The regression analysis was rerun for the remaining variables. No influential outliers were present in the data. The Durban- Watson statistic was calculated at 2.018 (within the range of 1.5-2.5) implying that no collusion exists in the data. Testing for independence of observations have been met. Collinearity was then assessed and the tolerance was noted to be greater than 0.1 with a WIF less than 10. No collinearity exists. The histogram, normal p-p plot, and scatter diagram were analysed for the dependant variable entrepreneurial intent and can be seen in Figure 7. The plots are good and it is concluded that underlying data assumptions have been met.

The regression formula is as follows:

$$\mathbf{Intent} = -0.328 + 0.38(\text{barriers}) + 0.629(\text{values}) + e$$

The findings of the quantitative and qualitative data analysis were found to converge as both found that interventions focusing on expectancy and value influenced students' entrepreneurial intent. The qualitative data analysis found that role model interventions focusing on the value of entrepreneurship (hypothesis H3) had approximately twice the influence on intent than interventions focusing on expectancy (hypothesis H2). It will be a recommendation of the framework that role model interventions should focus on changing perceived barriers, increasing expectancy (H2), and changing perceived desirability, increasing value (H3), with an emphasis on desirability

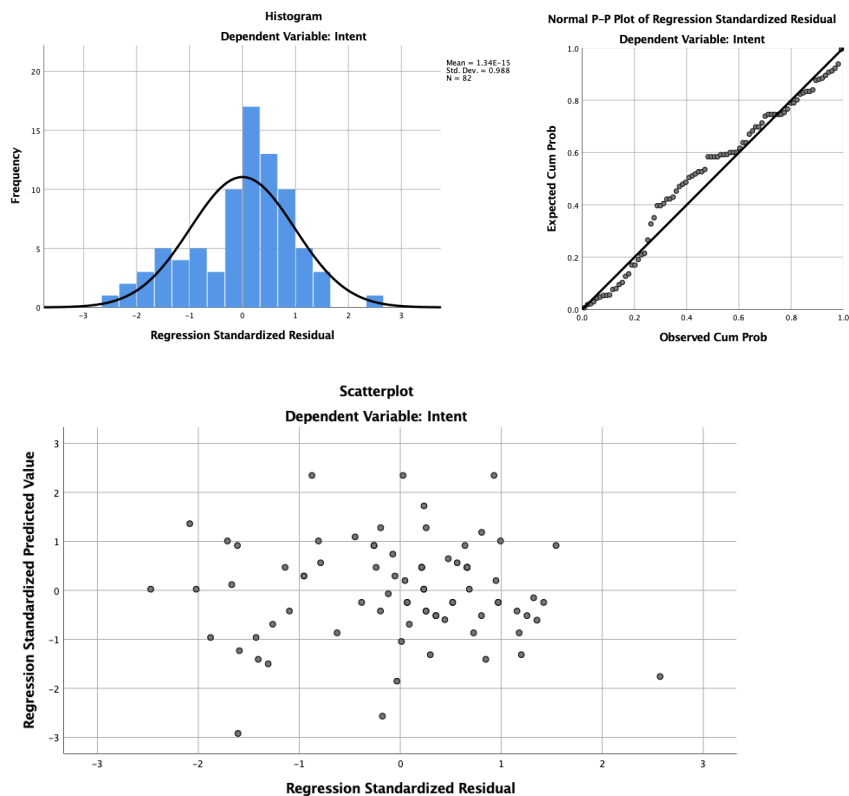


Figure 7: Regression plots (source: current research)

### 5.3 Post lecture student entrepreneurial intent using IEIS

All 82 students completed the evaluation stage questionnaire. Students' post-talk entrepreneurial intent was again measured using Thompson's (2009) IEIS (scale 1 "very untrue" - 6 "very true") with an intent of 2.91 (SD = .9). The scale's Cronbach's alpha coefficient of internal reliability was calculated to be 0.734, hence, the scale seemed to have acceptable internal reliability. The contribution of individual items to overall internal reliability was checked and found to be positive in each case, with the average corrected item-total correlation being 0.48.

Thompson's (2009) IEIS showed a moderate increase from 2.83 pre-talks to 2.91 post-talks. The scale was shown to have good internal reliability but based on the positive findings of the quantitative analysis, the scale's suitability to measure a student's entrepreneurial intent should be queried.

## 6. Discussion on use of IEIS to measure student entrepreneurial intent

A consistent metric for the measurement of entrepreneurial intent has hindered entrepreneurial research (Bruyat & Julien, 2001). As discussed in earlier papers, Thompson's (2009) IEIS was the chosen scale for this study. Thompson's scale is the most widely applied particularly in the area of the role of education on entrepreneurial intent (Küttim et al., 2014; Liñán et al., 2011; Lorz & Volery, 2011; Vanevenhoven & Liguori, 2013). The scale was shown to "incorporate high content validity, plus broad applicability across populations by nationality, age, and occupation" (Thompson, 2009, p. 687). Furthermore, the items selected "help maximise general applicability to most individuals with entrepreneurial intent regardless of the stage of which they might have advanced regarding setting up a firm" (Thompson, 2009, p. 687).

Thompson's (2009) IEIS (scale 1 "very untrue" - 6 "very true") showed a moderate increase from 2.83 (Cronbach's  $\alpha=0.744$ ) pre-talks to 2.9 (Cronbach  $\alpha=0.734$ ) post-talks. A paired sample t-test was conducted ( $t=0.938$ ,  $p=0.351$ ) and it was concluded that the change in the mean was statistically insignificant. The scale comprised of six items and the results for each item are shown in Table 9. In relation to the Likert scale used the result indicates that students' intent to become an entrepreneur was 'slightly untrue' before the lectures and 'slightly untrue' after the lectures. This does not converge with the results of the qualitative study where approximately a quarter of all students indicated positive intent (21 individual reflections, 29 references) and approximately 70% of students (57 individual reflections, 130 references) indicated the positive influence that the role model talks had on their entrepreneurial intent. When looking closely at the items of the IEIS it may be surmised that the scale may be more suited to more experienced professionals than students. Specific questions relating to saving money, reading books on setting up a firm, and actively learning about starting a firm may not feature highly on students' priorities.



## IEIS Results

Items	Pre-Lect.	Post-Lect.
1: Intend to set up a company in the future	3.0610	3.3293
4: Never search for business start-up opportunities (R)	3.1829	3.2561
6: Are saving money to start a business	2.0000	1.8537
7: Do not read books on how to set up a firm (R)	2.6220	2.7561
9: Have no plans to launch your own business (R)	3.4634	3.4512
10: Spend time learning about starting a firm	2.6585	2.7561
<b>Intent</b>	2.8313	2.9004

Table 9: IEIS items pre-lecture and post-lectures (source: current research)

As previously outlined by Bruyat and Julien (2001) a lack of a consistent metric has hindered entrepreneurial research and this may be even more pronounced when attempting to measure the intent of students. As part of the quantitative study of this research the “Role Model Motivation” scale was developed to give a measure of intent based on the motivation of entrepreneurial talks. The items of the scale can be found in Table 10. The scale (scale 1 “strongly disagree” - 5 “strongly agree”) displayed good reliability and validity results with a mean of 3.485 (Cronbach’s  $\alpha=0.785$ ) tending towards the “agree” on the Likert scale. It is proposed that before additional research is carried out in this area that a reliable scale is developed and tested.

Items	Post-Lect.
1: I would keep my options open and would consider starting a business in the future	3.8293
2: I will attend more entrepreneurial talks in the future to gain additional knowledge	3.2073
3: If I come up with a new idea I would now be more likely to investigate starting a new business	3.9390
4: These entrepreneurial talks have made me reconsider my options and I would consider starting a new business in the future.	2.9634
5: These entrepreneurial talks have motivated me to consider entrepreneurship in the future	3.4878
<b>Intent</b>	<b>3.4856</b>

Table 10: Researcher’s developed “Role Model Motivation” scale, post-lecture (source: current research)

## 7. Conclusion and next steps

Previous empirical studies loosely suggest a positive influence of role models on the decision to become an entrepreneur but a link between role model influence and entrepreneurial intent is inconclusive leading to the research question:

*Can role models increase students' entrepreneurial intent by increasing their expectancy of entrepreneurial success and/or by highlighting the rewards of entrepreneurial success?*

The study consisted of an initial investigation phase to gather benchmark entrepreneurial attitudes and intent, a series of lectures by five entrepreneurs (role model intervention), and an evaluation phase to determine the effectiveness of the lectures. The role models were selected after an investigation stage survey and included entrepreneurs in the construction, financial services, biomedical devices, and agricultural technology sectors. The thematic analysis of post-lecture student reflection identified three general dimensions: expectancy of entrepreneurial success, value of entrepreneurial success, and the effectiveness of the role model intervention.

Findings from the qualitative data indicate that role model interventions can influence entrepreneurial intent by increasing expectancy of success and the rewards of entrepreneurial success. The discussion section of this research series will analyse these findings by reference to the literature and the underlying theory, Morgenroth et al. (2015) "The motivational theory of role modelling".

It should be noted that the change in entrepreneurial intent using Thompson's (2009) IEIS was found to be statistically insignificant. This finding did not converge with the results of the qualitative study where approximately a quarter of all students indicated positive intent (21 individual reflections, 29 references). The use of the IEIS will need to be investigated further. It is proposed that before additional research is carried out in this area that a reliable scale is developed and tested. Another potential concern was the possibility that students' responses may be influenced by the fact that they were giving feedback on an activity organised by their lecturer (the researcher) as part of their module. They may feel it necessary to give positive feedback. Students had the option to attend four of the five lectures with approximately 60% attending all five lectures indicating their genuine positive association with the lectures. Fourteen students indicated that the lectures had no influence on their entrepreneurial intent

and 8 students indicated the negative influence the lectures had on their entrepreneurial intent indicating that students did feel obliged to give positive feedback.

A quantitative analysis concluded that role model interventions focusing on the value of entrepreneurship had approximately twice the influence on intent than interventions focusing on expectancy. The motivational theory of role modelling (Morgenroth et al., 2015) is supported. They emphasise how the power of role models can be utilised to increase role aspirants' motivation by influencing expectancy (attainability) and rewards (desirability). Approximately 70% of students (57 individual reflections, 130 references) indicated the positive influence that the role model talks had on their entrepreneurial intent. Twenty-three students indicated both an increase in confidence in their own skills and now perceived entrepreneurial success more achievable. According to the latest Global Entrepreneurship Monitor (GEM) 2018 Survey of Entrepreneurship in Ireland "fear of failure" is a barrier for 4 in 10 Irish people with Ireland ranked tenth in the EU. With approximately half of all students reflecting on their attitude to failure changing as part of the lectures it suggests that this can play a key role in entrepreneurial motivation. Students indicated a positive perception towards the entrepreneurs with 183 positive references to admiration, inspiration, motivation and successfulness. Negative perceptions were less evident with 18 references relating to a lack of inspiration and a lack of success. In general students found the entrepreneurial talkers to be inspirational and motivational with one student commenting;

*"I think that their motivation and inspiration have shown me that becoming an entrepreneur is challenging however possible and an enriching job."*

Following the findings of this paper, a framework for role modelling intervention as a motivational tool for entrepreneurship will be presented. Recommendations for future study, including the development of a reliable scale for student entrepreneurial intent, will be discussed. A theoretically informed statement summarising key contribution to professional practice will be outlined and the limitations of the study will be discussed. Finally, a conclusion chapter will summarise the key findings and conclusions of this research study. This research will be cyclical in nature and it is proposed that further role model interventions will take place with the aim of fine tuning the interventions to have the greatest influence on entrepreneurial intent.

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**Appendices**  
**Appendix A: Investigation Phase Survey**



## Entrepreneurship Lecture Series

Student Number

Gender

- Male  
 Female

Age

Class

- DME4  
 DBE4



## Entrepreneurship Lecture Series

**Thinking of yourself, how true or untrue is it that you:**



Intend to set up a company in the future

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Plan your future carefully

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Read business newspapers

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Never search for business start-up opportunities

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Read financial planning books

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Are saving money to start a business

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Do not read books on how to set up a firm

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Plan your finances carefully

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Have no plans to launch your own business

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Spend time learning about starting a firm

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true



Entrepreneurship Lecture Series

I plan to start a new business

- On graduation
- 1-3 years after graduation
- 4-6 years after graduation
- More than 6 years after graduation
- Undecided
- Never



## Entrepreneurship Lecture Series

Do you have any family that you would consider to be entrepreneurs?



## Entrepreneurship Lecture Series

What family member(s) would you consider to be entrepreneurs?

What type of entrepreneurial activity are they involved in?

How have they influenced you to consider entrepreneurship as an alternative career path in the future?

- Highly positively influenced
- Positively influenced
- No influence
- Negatively influenced
- Highly negatively influenced

Why have they influenced your decision to become an entrepreneur positively or negatively?

Please indicate your level of agreement with the following statements

They are a risk-taker

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

They are ambitious

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

They are innovative

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

They are hard-working

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

They are proactive

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

They strongly believe in their own ability and believe that they will be successful

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree



Entrepreneurship Lecture Series

Do you personally know or have you personally met any non-family entrepreneurs?



Entrepreneurship Lecture Series

Who is the entrepreneur?

What type of entrepreneurial activity are they involved in?

How have they influenced you to consider entrepreneurship as an alternative career path in the future?

- Highly positively influenced
- Positively influenced
- No influence
- Negatively influenced
- Highly negatively influenced

Why have they influenced your decision to become an entrepreneur positively or negatively?



## Entrepreneurship Lecture Series

**Please indicate your level of agreement with the following statements**

They are a risk-taker

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

They are ambitious

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

They are innovative

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

They are hard-working

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

They are proactive

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

They strongly believe in their own ability and believe that they will be successful

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree





## Entrepreneurship Lecture Series

What would you say are the barriers to starting a business for you?

How do you think you could overcome those barriers?

Do you think if you started a business that it would be a success?

Yes

No



## Entrepreneurship Lecture Series

Why do you think your business would be a success?



## Entrepreneurship Lecture Series

What would you say would be the rewards of being an entrepreneur?

How would you value those rewards?



## Entrepreneurship Lecture Series

What personal attributes have you that would make you a successful entrepreneur?

Would you consider yourself a risk taker?

Yes

No

## **Appendix B: Evaluation Phase Survey**



## Post Entrepreneurship Lecture Series Survey

Student Number

Gender

- Male  
 Female

Age

Class

- DME4  
 DBE4



## Post Entrepreneurship Lecture Series Survey

**Thinking of yourself, how true or untrue is it that you:**

Intend to set up a company in the future

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Plan your future carefully

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Read business newspapers

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Never search for business start-up opportunities

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Read financial planning books

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Are saving money to start a business

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Do not read books on how to set up a firm

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Plan your finances carefully

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Have no plans to launch your own business

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true

Spend time learning about starting a firm

- 1 - Very untrue
- 2 - Untrue
- 3 - Slightly untrue
- 4 - Slightly true
- 5 - True
- 6 - Very true



## Post Entrepreneurship Lecture Series Survey

**Based on your perceptions of the role model speakers, please indicate whether you: (1) Strongly Disagree (2) Disagree (3) Neither Agree nor Disagree (4) Agree (5) Strongly Agree with each of the following statements.**

I think the role models have been successful in starting a business

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

I share the same success goals as the role models

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

I think I have similar qualities to be a successful entrepreneur

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

I share the same work ethic as the role models

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree



Post Entrepreneurship Lecture Series Survey

**Based on your perceptions of the role model speakers, please indicate whether you: (1) Strongly Disagree (2) Disagree (3) Neither Agree nor Disagree (4) Agree (5) Strongly Agree with each of the following statements.**



The role models have overcome significant barriers to becoming an entrepreneur

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

I can overcome finance barriers as demonstrated by the role models

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

I can overcome my lack of experience as an entrepreneur as demonstrated by the role models

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree



Post Entrepreneurship Lecture Series Survey

**Based on attending the role model lectures, please indicate whether you: (1) Strongly Disagree (2) Disagree (3) Neither Agree nor Disagree (4) Agree (5) Strongly Agree with each of the following statements.**

I would value being an entrepreneur more now than before

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

I have realised new rewards of being an entrepreneur

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

I would like to have the same rewards from a successful business as these entrepreneurs

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree



Post Entrepreneurship Lecture Series Survey

**Based on attending the role model lectures, please indicate whether you: (1) Strongly Disagree (2) Disagree (3) Neither Agree nor Disagree (4) Agree (5) Strongly Agree with each of the following statements.**

I would keep my options open and would consider starting a business in the future

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

I will attend more entrepreneurial talks in the future to gain additional knowledge

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

If I come up with a new idea I would now be more likely to investigate starting a new business

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

Prior to these talks I did not have any plans to start a business in the future. These entrepreneurial talks have made me reconsider my options and I would consider starting a new business in the future.

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

These entrepreneurial talks have motivated me to consider entrepreneurship in the future

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

## Appendix C: Phase 2 Initial Raw Themes

Name	Files	References
Accessible	1	1
Achievement motivation	35	50
Admiration	60	88
Advantage of starting when young and no commitments	4	4
Analyse the market first	1	1
Anyone can be an entrepreneur	6	6
Being in charge of your own destiny	5	5
Being your own boss reward	41	50
Belief in their product	2	4
Business skills	1	1
Change in my attitude from not wanting entr. to wanting entr.	13	22
Communication skills	12	13
Confidence in own skills	23	34
Confident	10	14
Determined	12	14
Doubts	1	4
Drive	3	4
Driven	4	5
Enthusiasm	6	6
Experience first	16	17
External influence non-family	1	1
Exuberant	1	1
Fail and fail fast	40	49
Family	6	8
Family entrepreneurial struggles	2	3
Female role model	1	1
Financial reward	20	29
Flexible hours in the work place	1	1
Freedom in life	4	6
Greater understanding	6	6
Hard working	32	58
Having belief in your idea	1	1
Historical negative attitude to entrepreneurship	1	2
I do not have these traits	4	4

<b>Name</b>	<b>Files</b>	<b>References</b>
Idea does not necessarily need to be innovative	8	9
Increased expectancy	12	19
Innovator	4	4
Inspirational	17	20
Intent	21	29
Internalisation of role model qualities	65	91
Job security	1	2
Knowledge	5	5
Leaving a well-paid secure job	11	14
Long hours	2	2
Long time to be successful	6	9
Management skills	2	2
Marketing	4	6
Mild intent	2	2
modifying existing technologies	2	3
Motivating	2	3
Negative influence from role model talks	8	11
Negative intent	10	14
Negative intent but remain open to starting business	5	8
Networking	8	10
No change in attitude	4	4
No change in my attitude that I don't want to be an entrepreneur	13	20
No previous experience required	1	1
Nothing to lose	1	1
Now perceive it is more achievable to be successful	26	40
Overcoming difficulties	12	13
Overcoming finance barriers	35	48
Passionate	17	18
Perception on own entrepreneurial traits for success	2	2
Persistence	8	8
Personality traits	4	5
Positive influence of role model talks	53	115
Proactive	1	1
Problem solver	2	2
Resilient	4	7
Resourceful	1	1

<b>Name</b>	<b>Files</b>	<b>References</b>
Responsibility	2	2
Rewards	15	17
Risk	31	46
Risk averse	7	14
Risk Taker	9	10
Sales ability	8	9
Satisfaction	1	1
Self-belief	12	15
Skills	1	1
Smart	2	2
Social entrepreneurship rewards	12	13
Social value	6	6
Startup supports	37	50
Still undecided	2	2
Stressful	2	5
Struggle with flexible hours	2	2
Successful	57	69
Surround yourself with technical knowhow	3	5
Technical skills	3	4
Time flexibility reward	28	36
Tired and worn	1	2
Travel	1	1
Uninspiring	5	6
Unreachable success	6	6
Unsuccessful	5	8
Variety reward	14	16
Wheeler dealer type	2	2
Work life balance	2	2
Youth	3	7
Barriers	1	82
Family role models	1	82
Entrepreneurial activity	1	82
Family influence	1	164
Non Family role models	1	82
Entrepreneurial activity	1	82
Non Family influence	1	82

<b>Name</b>	<b>Files</b>	<b>References</b>
Overcome barriers	1	82
Rewards	1	82
Role aspirants' traits	1	82
Value of rewards	1	82

## Appendix D: Phase 3 & 4 Parent Child coding and further refinement of themes

Name	Files	References
<b>Attainability</b>	0	0
Accessible	1	1
Anyone can be an entrepreneur	6	6
No previous experience required	1	1
Unreachable success	6	6
<b>Family role models</b>	0	0
Family entrepreneurial struggles	2	3
Family influence	1	82
Family role models	7	90
<b>Increased expectancy</b>	12	19
Confidence in own skills	23	34
Now perceive it is more achievable to be successful	26	40
Perception on own entrepreneurial traits for success	2	2
<b>Influence of talks</b>	0	0
Negative influence from role model talks	8	11
No influence	14	22
Positive influence of role model talks	57	130
<b>Insight gained</b>	0	0
Advantage of starting when young and no commitemnts	7	11
Analyse the market first	5	7
Experience first	16	17
Fail and fail fast	40	49
Having belief in your idea	1	1
Idea does not necessarily need to be innovative	9	11
Knowledge	11	11
Long time to be successful	6	9



<b>Name</b>	<b>Files</b>	<b>References</b>
Management skills	2	2
Networking	8	10
Nothing to lose	1	1
Surround yourself with technical knowhow	3	5
<b>Intent</b>	0	0
Mild intent	2	2
Still undecided	2	2
Negative intent	10	14
Doubts	1	4
Historical negative attitude to entrepreneurship	1	2
Job security	1	2
Leaving a well-paid secure job	11	14
Long hours	2	2
Negative intent but remain open to starting business	5	8
Responsibility	2	2
Stressful	2	5
Struggle with flexible hours	2	2
Positive Intent	21	29
<b>Non-family role models in network</b>	0	0
External influence non-family	2	83
Non-family role models	1	82
<b>Overcoming barriers</b>	12	13
Initial barriers	1	82
Overcoming finance barriers	35	48
Start-up supports	37	50
<b>Perception of role model</b>	0	0
Negative perception of role model	0	0

Name	Files	References
Tired and worn	1	2
Uninspiring	5	6
Unsuccessful	5	8
Wheeler dealer type	2	2
Positive Perception of role model	0	0
Admiration	60	88
Inspirational	17	20
Motivating	2	3
Smart	2	2
Successful	57	69
<b>Personality Traits</b>	0	0
I do not have these traits	4	4
Internalisation of role model qualities	65	91
Female role model	1	1
Role aspirant personality traits	1	82
Role model personality traits	0	0
Confident	10	14
Determined	12	14
Drive	3	4
Driven	4	5
Enthusiasm	6	6
Exuberant	1	1
Hard working	32	58
Innovator	4	4
Passionate	17	18
Persistence	8	8
Personality traits	4	5

<b>Name</b>	<b>Files</b>	<b>References</b>
Proactive	1	1
Problem solver	2	2
Resilient	4	7
Resourceful	1	1
Risk	31	46
Risk averse	7	14
Risk Taker	9	10
Self-belief	12	15
<b>Rewards</b>	15	17
Achievement motivation	36	51
Being in charge of your own destiny	5	5
Being your own boss reward	41	50
Financial reward	20	29
Initial rewards	1	82
Value	1	82
Social entrepreneurship rewards	17	19
Time flexibility reward	34	44
Variety reward	14	16
<b>Role Model Skills</b>	0	0
Belief in their product	2	4
Business skills	1	1
Communication skills	12	13
Sales ability	8	9
Technical skills	3	4

### **Appendix E: Phase 5 Final Themes**

<b>Name</b>	<b>Files</b>	<b>References</b>
<b>Effectiveness of role model intervention</b>	0	0

<b>Name</b>	<b>Files</b>	<b>References</b>
<b>Motivation</b>	0	0
<b>Influence of talks</b>	0	0
Negative influence from role model talks	8	11
No influence	14	22
Positive influence of role model talks	57	130
Unreachable success	6	6
<b>Intent</b>	0	0
Mild intent	4	4
Negative intent	13	24
Positive Intent	21	29
<b>Role model attributes</b>	0	0
<b>Family role models</b>	0	0
Family entrepreneurial struggles	2	3
Family influence	1	82
Family role models	7	90
<b>Internalising Traits</b>	0	0
I do have these traits	65	91
I do not have these traits	4	4
Role aspirant traits	1	82
<b>Non-family role models in network</b>	0	0
External influence non-family	2	83
Non-family role models	1	82
<b>Role model personality traits</b>	0	0
Confident	10	14
Determined	12	14
Drive	3	4

<b>Name</b>	<b>Files</b>	<b>References</b>
Driven	4	5
Enthusiasm	6	6
Exuberant	1	1
Hard working	32	58
Innovator	4	4
Passionate	17	18
Persistence	8	8
Personality traits	4	5
Proactive	1	1
Problem solver	2	2
Resilient	4	7
Resourceful	1	1
Risk	31	46
Risk averse	7	14
Risk Taker	9	10
Self belief	12	15
<b>Role Model Skills</b>	0	0
Belief in their product	2	4
Business skills	1	1
Communication skills	12	13
Sales ability	8	9
Technical skills	3	4
<b>Role Model Perception</b>	0	0
<b>Negative perception of role model</b>	0	0
Tired and worn	1	2
Uninspiring	5	6
Unsuccessful	5	8

<b>Name</b>	<b>Files</b>	<b>References</b>
Wheeler dealer type	2	2
<b>Positive Perception of role model</b>	0	0
Admiration	60	88
Female role model	1	1
Inspirational	17	20
Motivating	2	3
Smart	2	2
Successful	57	69
<b>Expectancy</b>	0	0
<b>Increased expectancy</b>	12	19
Confidence in own skills	23	34
Now perceive it is more achievable to be successful	26	40
Perception on own entrepreneurial traits for success	2	2
<b>Insight gained</b>	0	0
Advantage of starting when young and no commitments	7	11
Analyse the market first	5	7
Anyone can be an entrepreneur	7	7
Experience first	16	17
Fail and fail fast	40	49
Having belief in your idea	1	1
Idea does not necessarily need to be innovative	9	11
Knowledge	11	11
Long time to be successful	6	9
Management skills	2	2
Networking	8	10
No previous experience required	1	1
Nothing to lose	1	1

<b>Name</b>	<b>Files</b>	<b>References</b>
Surround yourself with technical knowhow	3	5
<b>Overcoming barriers</b>	12	13
Initial barriers	1	82
Overcoming finance barriers	35	48
Start-up supports	37	50
<b>Value</b>	15	17
<b>Value of entrepreneurship</b>	0	0
Achievement motivation	36	51
Being in charge of your own destiny	5	5
Being your own boss reward	41	50
Financial reward	20	29
Initial rewards	1	82
Initial value	1	82
Social entrepreneurship rewards	17	19
Time flexibility reward	34	44
Variety reward	14	16
<b>Value of full time employment</b>	0	0
Job security	12	16
Less hours	2	2
Less Responsibility	2	2
Less risk	1	4
Less stress	2	5
Predefined hours	2	2

## Appendix E: Sample of the thematic analysis process

Phase	Examples of procedure for each step
1. Familiarising oneself with the data	Organising data; reading and re-reading; noting down initial codes
2. Generating initial codes	Coding interesting features of the data in a systematic fashion across the data-set, collating data relevant to each code
3. Searching for themes	Collating codes into potential themes, gathering all data relevant to each potential theme
4. Involved reviewing the themes	Checking if the themes work in relation to the coded extracts and the entire data-set; generate a thematic “map”
5. Defining and naming themes	Ongoing analysis to refine the specifics of each theme; generation of clear names for each theme
6. Producing the report	Final opportunity for analysis selecting appropriate extracts; discussion of the analysis; relate back to research question or literature’ produce report

Table Appendix E: Six-step thematic analysis procedure (source: Braun and Clarke, 2006, p.94)

Phase 1 involved organising the data, reading and re-reading the data and noting down initial codes. Phase 2 involved importing the data into Nvivo QDA software and the interesting features were coded (see Appendix A). In order to further demonstrate the process, the flexibility reward and its perceived value will be discussed. Being in charge of your own destiny, freedom in life, rewards, time flexibility, work life balance, and value of rewards were all raw themes that may or may not be linked to being flexible with your time. References to these nodes were then re-examined. For example, a reference to the initial code “being your own boss” was as follows:

*“This said, I have always liked and aspired to the idea of being my own boss and setting my own deadlines and working hours, while being in control of my own finances, something which is definitely attainable through entrepreneurship.”*

This was then recoded and split into two codes, “being your own boss” and “time flexibility”.

When examining the references for the initial code “freedom in life” it was noted that respondents were mainly discussing “time flexibility” and being your own boss”



*“An entrepreneur is doing what he or she loves to do while putting the full range of their ability and skill into the business. Other rewards of having your own business would be that you will be hiring and working with a team of like-minded people. It would give the freedom to be able to work to a time that suits you and possibly spend more time with your family.”*

This reference was then recoded into the two notes and the “freedom of life” initial code was discarded as it was merged into the other two codes. Other codes with similar meanings were then identified. Once the codes were reduced general themes were then identified. For example all the codes relating to value of entrepreneurship were identified and all the codes relating to value of full time employment were identified and moved into a parent node for both.

In order to search for overall dimensions the nodes were ranked in order of the number of references with “positive influence of role models talks” ranked first (115 references), followed by “internalising role model qualities” (91 references), admiration (88 references) and success (69 references). A node of interest was “change in attitude from not wanting to be an entrepreneur to now considering it” referenced 22 times as again this relates to a directly referenced change in attitude. The two participants with the most references to the nodes “positive influence of talks” and “positive change in attitude” were then compared to look for patterns in the data (see Figure E.1). It can be noted that both had a family influence and both discussed a change in attitude. Both talked about the rewards and values (value dimension), and now perceiving it more achievable to be successful (expectancy dimension) and the influence of the talks (effectiveness dimension). By comparing other participants similar themes were identified and categorised. The comparison was checked again in Phase 4 to check for duplication in codes and general themes (Appendix E2).

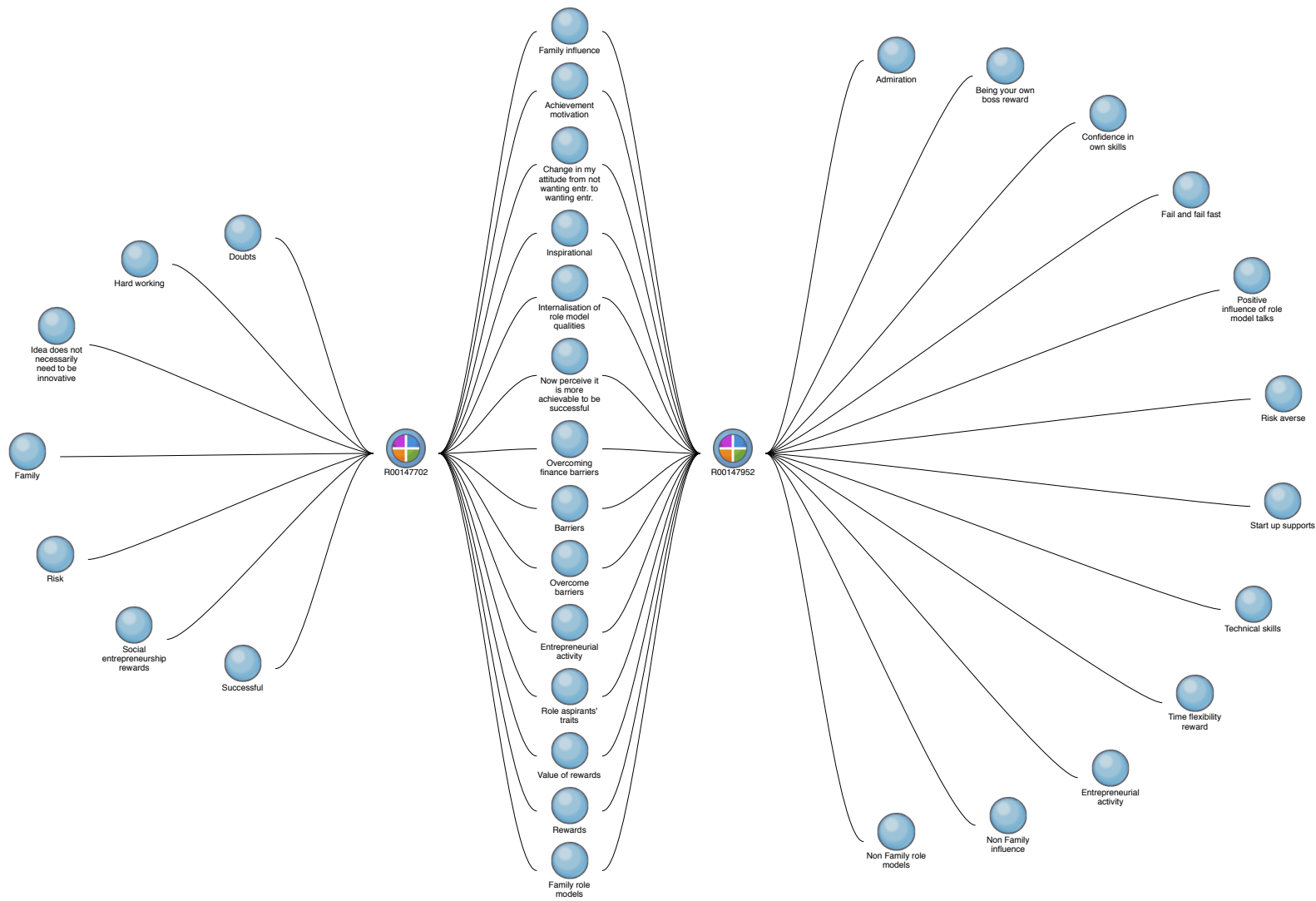


Figure E.1: Phase 2 comparison of participants to identify common themes and duplicate nodes

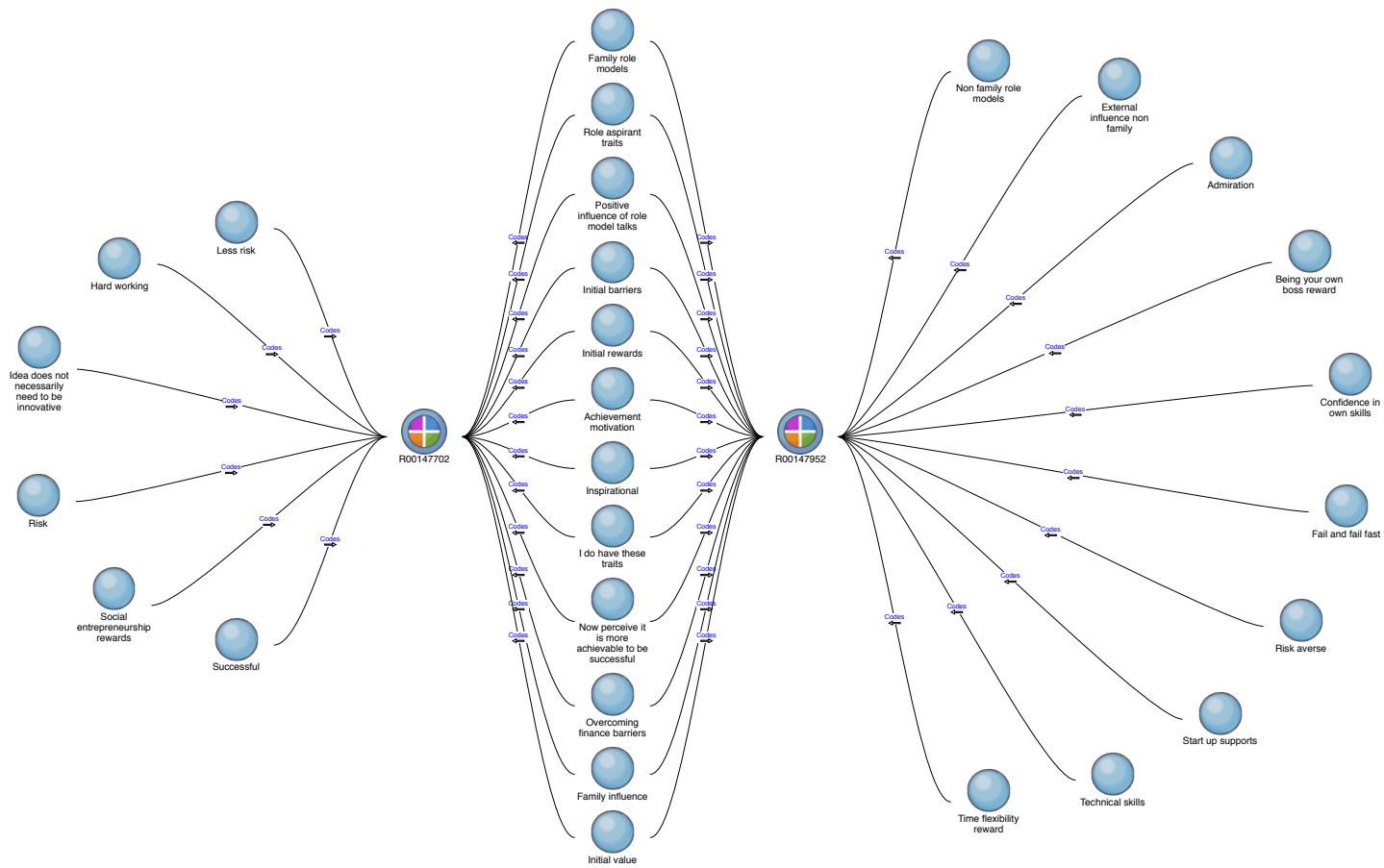


Figure E.2: Phase 4 comparison of participants showing no duplicate nodes (source: current research)

**Section 3:  
Discussion,  
Conclusions, &  
Recommendations**

## 1. Introduction

The data analysis provided several key findings which were presented in paper 4 “Findings and Discussion”. This section of the thesis discusses these research findings and how they address the overall research objectives:

- 1.To investigate how role models can be used to motivate students to consider entrepreneurship as a career.
- 2.To understand how role model interventions can be most effective in motivating students to consider entrepreneurship as a career.
- 3.To develop a framework for the use of role modelling intervention for the promotion of entrepreneurship as a career.

The findings addressing these objectives offer new insights into how role models can be used to influence entrepreneurial intent. The research indicates that role model interventions can influence entrepreneurial intent by increasing the expectancy of success and the rewards of entrepreneurial success (for details see Paper 4, section 4.4). The quantitative analysis concluded that role model interventions focusing on the value of entrepreneurship had a greater influence on intent than interventions focusing on expectancy (for details see Paper 4, section 5.2). The underlying theory of this study, the motivational theory of role modelling (Morgenroth et al., 2015) holds. Approximately 70% of students indicated the positive influence that the role model talks had on their entrepreneurial intent as is summarised by reflections from three of the students who attended;

*“I would never have considered becoming an entrepreneur before I attended these talks but my attitude towards this has now changed for a few reasons. Each of the entrepreneurs thought [sic] me not to be afraid of failing.”*

*“I thought the talks were very beneficial for me about entrepreneurship because before the talk I would never have thought about becoming an entrepreneur but when listening to each entrepreneur at different stages of their projects it has changed my mind”*

*“Previous to these presentations I would have never considered starting up my own company but having gained knowledge around the area and learning about other experiences it has been an eye opener that entrepreneurship is a viable career path.”*

This section of the thesis is structured as follows: firstly, a discussion is provided in relation to the findings identified in Paper 4 “Findings and Discussion”. These findings are then summarised in a table providing easier reference for the reader. Secondly, a proposed questionnaire resulting from the study, the role model entrepreneurship motivation questionnaire, and its potential use will be discussed. The proposed framework is also presented which aims to inform how role modelling intervention can be used to promote entrepreneurship as an alternative career for students. Thirdly, the key contributions to knowledge and professional practice are outlined. This is followed by a discussion on the limitations of the study, opportunities for further research, and concluding remarks.

## **2. Discussion**

This study is positioned in the field of entrepreneurship motivation and intentions and the research contributes to entrepreneurship theory and practice. This discussion will aim to demonstrate that contribution. The foundation theory, the motivational theory of role modelling (Morgenroth et al., 2015), and the associated four propositions, will frame the presentation of the discussion and will establish that the theory holds, i.e. role models can be used to increase role aspirants’ motivation by influencing expectancy (attainability) and the value of entrepreneurial rewards (desirability). The findings will be used to outline a practical framework that will offer guidance on how to use role models most effectively to influence entrepreneurial intent. The framework can be valuable for those involved in motivating individuals to contemplate entrepreneurship, those involved in career guidance, or for policy makers developing effective tools to promote entrepreneurship over the long-term. This research is not primarily concerned with entrepreneurship pedagogy but the findings can also be useful for educators with an aim to increase entrepreneurial intent of their students and when offering career advice to students.

As presented in Paper 4 “Findings and Discussion”, both the qualitative and quantitative data identified the value of entrepreneurship and expectancy of entrepreneurial success as key drivers of entrepreneurial motivation. The quantitative analysis supports the hypothesis that role models positively influence entrepreneurial intent by increasing expectancy and increasing the desirability (value) of entrepreneurial success. These findings are in line with the proposals of the motivational theory of role modelling (Morgenroth et al., 2015). This was supported by the qualitative thematic analysis which identified three general dimensions: expectancy of entrepreneurial success, the value of success, and the effectiveness of the role model intervention (for details see Paper 4, section 4). If value and expectancy are the key drivers of entrepreneurial motivation, then the effectiveness of the intervention gives an indication as to how the motivation can be maximised.

Figure 1 shows a thematic mind map to aid the reader when navigating this discussion section. The thematic mind map attempts to link the findings from the quantitative analysis and the qualitative analysis to the four propositions of this study. The effectiveness of the intervention will provide an input to both the expectancy and value components. It was concluded from the quantitative data analysis that role model interventions focusing on the value of entrepreneurship had a greater influence on intent than interventions focusing on expectancy (for details see Paper 4, section 5.2). This will play a key role in the effectiveness of the intervention.

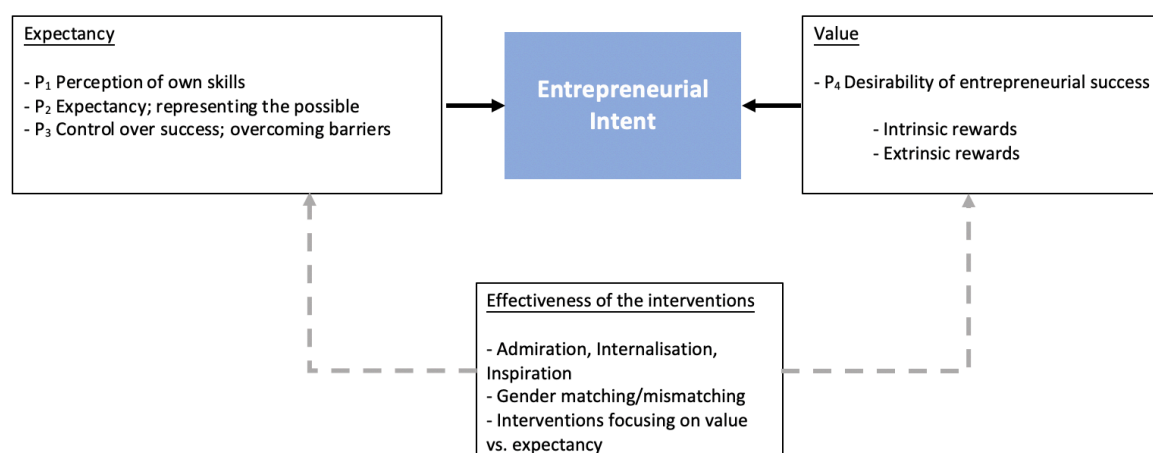


Figure 1: Thematic Mind Map (source: current research)

This section offers a discussion of the themes and findings presented in Paper 4 “Findings and Discussion” in the context of current literature. The first section will explore how role models influenced the expectancy of entrepreneurial success and each associated proposition (P<sub>1</sub>, P<sub>2</sub>, and P<sub>3</sub>) will be addressed in its own subsection. The second section will discuss how role models influenced the value of entrepreneurial rewards and the associated proposition P<sub>4</sub>. The third section will examine the effectiveness of the intervention with a view to making recommendations on how to maximise the motivating influence of role models. Female entrepreneurship could be discussed under expectations and proposition P<sub>3</sub>, as it could relate to overcoming perceived gender barriers to entrepreneurship (Austin & Nauta, 2016; Buttner, 1993). On closer examination, there was no reflection on overcoming perceived gender barriers. Female entrepreneurship will therefore be discussed in the context of the effectiveness of the intervention and to investigate the effect that gender matching or mismatching had on the intervention.

## **2.1 Expectancy of entrepreneurial success**

According to Baum and Locke (2004, p.94), “expectancy theory provides a framework for understanding why and how some people choose to be entrepreneurs”. Expectancy theories focus on individual’s beliefs about their capability and efficacy, expectancies for success or failure, and their sense of control over the outcomes (Eccles & Wigfield, 2002). Three propositions of this study relate to role models influencing expectancy of success, and findings supporting these propositions will now be discussed.

### **2.1.1 Proposition P<sub>1</sub>: Role models positively influence the role aspirant’s perception of their own entrepreneurial competencies.**

The first proposition focuses on how role models can influence an individual’s expectancy based on internal factors. An individual’s perceived probability of success is founded on their own perceived abilities and traits and is closely related to self-efficacy. Following a review of the qualitative data, 28% of student indicated an increase in the perception of their own skills, supporting proposition P<sub>1</sub>, and as one student indicated; “*After listening to each speaker talk*



*about their background, it has given me more belief that I myself have the ability and opportunity to become an entrepreneur”.*

This was further reinforced by the quantitative data with 45 students indicating that they agreed, or strongly agreed, with the statement “I think I have similar qualities to be a successful entrepreneur”. Related to expectancy of success, students discussed a change in their attitude from “*never being able*” as they “*didn’t have the skills or know how*”, but now felt “*more confidence to pursue entrepreneurship in the future*”. Based on the findings from both the quantitative and qualitative data, it is found that proposition P<sub>1</sub> is supported. This is in line with, and supports, current literature which suggests that role models can shape an individual’s perception of their own entrepreneurial competencies (Bosma et al., 2012; Laviolette et al., 2012; McCullough, 2013).

### **2.1.2 Proposition P<sub>2</sub>: Role models positively influence the role aspirant’s expectation of success**

The second proposition focuses on how role models can influence an individual’s general expectancy of success by “representing the possible” (Morgenroth et al., 2015, p.8). Following a review of the qualitative data, 32% of students an increased perception that entrepreneurial success is more achievable. These reflections related to a general observation that the entrepreneurs were successful and the students believed that they could be successful too. These reflections differed from those in proposition P<sub>1</sub> as they did not focus on how to become a successful entrepreneur but that the entrepreneurs represented that success is possible. As one student reflected; “*Role Model A instilled a vision of achievable success upon me, this was likely due to the way which he started his company.*” A common reflection was that the entrepreneur was “an engineer like me” and as another student posited; “*Coming from a Biomedical Engineering background it makes me think that entrepreneurial success would be achievable for me.*” Another concluded; “*I saw a lot of similarities between myself and Role Model D and as a result gave me a sense of belief that a career in entrepreneurship would be feasible and also enjoyable*”.

The quantitative data indicated that 66 students agreed, or strongly agreed, that the entrepreneurs were successful and 65 students agreed, or strongly agreed, that the role models had shown them that success is achievable. These findings align with the role model literature and support proposition P<sub>2</sub>. When individuals observe that the role model has become a successful entrepreneur, and students can identify with that role model, they can see themselves in the position of the role model, i.e. that success is attainable (Brown et al., 1992; Collins, 1996; Lockwood, 2006).

### **2.1.3 Proposition P<sub>3</sub>: Role models positively influence the role aspirant's perception of control over their own success**

The third proposition focuses on how role models can influence an individual's perception of control over external factors. They may believe they have the skills to become a successful entrepreneur but that external barriers will prevent them from doing so. General reflections discussed how the role models showed students that challenges could be overcome and as one student concluded; *“The prospect of setting up my own business seems far more achievable having heard how others have gone about it. Hearing the entrepreneurs speak about how they overcame challenges and the many resources available, whether from angel investors or government grants, made the prospect of starting my own business seem more realistic and far less daunting”*.

A lack of understanding of start-up financial supports was outlined in the investigation phase as the main barrier to entrepreneurship for students. This was a key input for the role model lectures, and role models were asked to discuss supports that are available to overcome these perceived financial barriers. This was evident when analysing both the qualitative and quantitative data. Following an analysis of the qualitative data, approximately half of the students reflected on a new-found understanding of the finances and supports available (for details, see Paper 4, section 4.1). This was further supported in the quantitative data with 58 students indicating that they agreed, or strongly agreed, that they could overcome finance barriers as demonstrated by the role models. This evidence supports proposition P<sub>3</sub> and as shown in other studies in this area (Robertson et al., 2003; Sandhu et al., 2011), demonstrates

that role models can help individuals to gain a better understanding of entrepreneurial supports and help them to overcome financial barriers.

The Global Entrepreneurship Monitor (GEM) 2016 Survey of Entrepreneurship in Ireland highlighted “fear of failure” as a barrier for four in 10 Irish people with Ireland ranked tenth in the EU. With approximately half of all students reflecting on their attitude to failure changing as part of the lectures, it suggests that this can play a key role in entrepreneurial motivation. “Fear of failure both inhibits and motivates entrepreneurial behaviour and therefore represents a rich opportunity for better understanding entrepreneurial motivation.” (Cacciotti et al., 2016, p.302). According to Olaison and Sørensen (2014), the topic of failure as an integral part of the entrepreneurial process has become a common theme in literature. Role models can play an important role in changing barriers due to fear of failure (Wyrwich et al., 2016).

To “fail and fail fast” was a common insight from the entrepreneurial talks. The concept mentioned was initially discussed by role model A. His business failed and he went through bankruptcy. He talked about the issues associated with spending many years working on a poor idea. He suggested that if an idea is going to fail, then it is best to fail early before wasting valuable personal energy and resources. The idea of “fail and fail fast” was further reinforced by role model B who discussed her start-up of ten years and how she constantly needed to reinvent the business to keep it alive when maybe it would be best to fail and start again. As put forward by one student; *“All five entrepreneurs have admitted in failing, and in hindsight they said they were grateful for those failures. Personally, this was an eye opener for me because I was able to understand through these well-established entrepreneurs that failing is just another step to success.”* This evidence again supports proposition P<sub>3</sub> and demonstrates that role models can play an important role in reducing individuals’ fear of failure and giving them the perception of greater control over their success.

## **2.2 Value of entrepreneurial success**

Values refer to an individual’s perceived desirability of the outcomes of success (Eccles & Wigfield, 2002). Eccles and Wigfield (2002) classify four types of task-value: attainment value, intrinsic value, utility value, and cost. They describe attainment value as “the personal

importance of doing well on the task” (p.119). Intrinsic value relates to the personal fun, or challenge you get from finishing a task. Utility value is a measure of how well a task relates to one’s current and future goals. Lastly, all choices are assumed to have costs associated with them, as one choice often eliminates other options.

### **2.2.1 Proposition P<sub>4</sub>: Role models positively influence the role aspirant’s desirability of entrepreneurial success by outlining the rewards and the value of that success.**

The fourth proposition focuses on how role models can influence an individual’s desirability of entrepreneurial success. It is proposed that they do this by outlining the rewards of success and the value of those rewards. Value is a key driver of motivation (Eccles & Wigfield, 2002; Morgenroth et al., 2015). As outlined by Carsrud and Brännback (2011), entrepreneurial motivation can be intrinsic or extrinsic. Intrinsic motivations are associated with the personal interest of entrepreneurial tasks and extrinsic motivations relate to the external rewards that follow completing a task and are associated with wealth and status. Traditional entrepreneurship research focused on extrinsic motivation and assumed that entrepreneurs were primarily motivated by external rewards such as wealth, power and status. Behaviourists emphasised the impact of extrinsic factors and the environment in encouraging entrepreneurial motivation (Hytti et al., 2010). They argue that individuals are motivated to do tasks that they are rewarded for doing. Current literature focuses on the importance of intrinsic motivation and attributes it to the main reason for serial entrepreneurs that may have already have been rewarded with wealth and status but continue starting new businesses for the intrinsic rewards (Carree & Verheul, 2012; Carsrud & Brännback, 2011). In Maslow’s hierarchy of needs, the highest level of needs (self-actualisation and self-development) is related to intrinsic motivations, whereas the lowest levels of needs (safety and security) are related to extrinsic motivations (Neto, 2015). Intrinsic and extrinsic entrepreneurial motivations are not mutually exclusive, and typically entrepreneurs are motivated by both. In general, students will not consider entrepreneurship if their basic needs are not met, i.e. to make a secure living. Extrinsic incentives are needed if the motivation is to be maintained (Good & Brophy, 1990). The optimal entrepreneurial motivation will therefore occur when individuals surmise that both their extrinsic needs and intrinsic needs can be fulfilled.

The findings from this research support the above references because following the role model intervention, students reflected on both the intrinsic and extrinsic motivators. Intrinsic motivators included achievement motivation, ‘being your own boss’, and time flexibility as being the most valued rewards. Half of the students reflected that achievement motivation was a key entrepreneurial reward that they valued i.e. the desire to achieve via one’s abilities and efforts to experience the enhanced self-esteem from the achievement (Miner, 1993). Being your own boss and the reward of time flexibility were common themes in the student reflections again, with half of the participants mentioning both as rewards that they valued. Students discussed a change in attitude and reflected on the entrepreneurs’ freedom, lifestyle, and ability to spend time with their families. This can be seen in a sample of the student reflections;

*“I do think there are a few rewards available to entrepreneurs that I hadn’t previously considered. Like Role Model E stated, they are able to plan their time and decide when they work, so that it doesn’t clash with their home life schedule. They are also their own boss and have great control over the rules and environment they work in.”*

*“One of those benefits that made me change my attitude towards entrepreneurship is that you are your own boss. This is a massive benefit especially considering that you can choose your hours worked.”*

*“The entrepreneurs outlined that the rewards from being a successful entrepreneur were not limited to just the financial benefits. Some of the rewards included a huge sense of independence, being your own boss, working your own hours and that the entrepreneur is in control of their job instead of letting their job control them. This sense of independence and control over your career is something I would like to emulate.”*

One new-found reward that students indicated had an intrinsic value was the social entrepreneurship reward, i.e. the reward of benefiting society, and was reflected on by approximately twenty percent of students. The reflections related in particular to the lecture given by role model D. Her company’s product replaces the requirement to put children under full anaesthetic in hospital conditions, allowing for procedures to be carried out in a general practitioner’s premises. The improvement to a child’s health and well-being and a reduction in

their pain experience resounded with students with 17 individual reflections. Twenty-nine of the 82 students were Biomedical Engineering students and in general, chose this discipline in order to work in a field that improves the standard of living of humans or animals. Seven of the 17 individual reflections on social rewards were from Mechanical Engineering students indicating that valuing the social reward was not unique to Biomedical Engineering students. As one Mechanical Engineering student reflected; *“Role Model D in particular showed that the start-ups in the medical industry are very rewarding as you can form a connection with people that you are helping, you can see the impact you are making on their lives and this is most important reward for me and I feel if I was to be involved in a start-up I would love for it to involve the medical industry as the idea of helping people is most rewarding.”*. In general, students were not reflecting that they wanted to become social entrepreneurs but that they valued the reward of making people’s lives better. According to Shaw and Carter (2007, p.419), the term “social entrepreneurship” has developed as a label for “describing the work of community, voluntary and public organisations, as well as private firms working for social rather than for-profit objectives.” In literature, “social entrepreneurship” and “business or for-profit entrepreneurship” are generally mutually exclusive. Students reflected on valuing social rewards but, also valuing financial rewards, and it can be interpreted that they are considering for-profit entrepreneurship with added social rewards.

As can be seen from the evidence above, the role models had a positive influence on the role models value of entrepreneurial success, supporting proposition P<sub>4</sub>. This was also reinforced by the quantitative data analysis with 50 of the students agreeing, or strongly agreeing, with the statement that following the talks they “now would value being an entrepreneur more than before”. As further evidence, 57 students agreed, or strongly agreed, that they had realised new rewards of being an entrepreneur following the talks. This is also in line with findings of similar studies which found that role models can influence how individuals value the rewards of entrepreneurship (Hisrich, 1990; Van Auken et al., 2006; Wyrwich et al., 2016).

### **2.3 Effectiveness of the intervention**

If value and expectancy are the key drivers of entrepreneurial motivation, then the effectiveness of the intervention gives an indication as to how the motivation can be maximised. Perception

of role model attributes is an important theme in examining the effectiveness of the intervention. Gibson (2004) presents two dimensions; positive role models, referring to role models having characteristics which are perceived by the individual as similar, and negative role models, referring to role models having characteristics which are mainly observed by the individual as examples of how not to behave in a certain situation. Usually studies have focused on positive role models and less so on negative role models. Both positive and negative role models are useful in helping individuals to learn (Merton, 1968).

The perception of the role models in this study was predominantly positive, with 68 of the students' individual reflections focusing on the positive perceptions of the role models. Reflections included perceptions of role models being inspirational, successful, motivating, and intelligent. Contrastingly, there were nine individual reflections on negative perceptions of the role models. These were perceptions that the role models were uninspiring, unsuccessful, and worn. Negative perceptions were noted for different role models but were most evident for one very established entrepreneurial role model. The nine students with these negative reflections reflected that this role model was "uninspiring" and as one posited, they "*couldn't relate to their product or solution*". This role model differed from the other four role models in that their business was a financial services start-up while all other speakers were technical or engineering related. Students were reflecting that they could not relate to this role model as their start-up was not relevant to them because they were soon to be engineering graduates. This finding may require further investigation to see if it is the same for other disciplines and may play a very important role in the future choice of role models.

### **2.3.1 Identification, admiration and internalisation**

Gibson (2004, p134) defines "a role model as a cognitive construction based on the attributes of people in social roles an individual perceives to be similar to themselves to some extent and desires to increase perceived similarity by emulating those attributes". The most effective interventions should then occur where the role aspirant perceives themselves to be similar to the role model and then want to emulate those attributes. Desirability indicates the level of positivity to which a role aspirant perceives a role model, i.e. the level a role aspirant wants to be like the role model. Personal identification, internalisation, and admiration play an important

factor on the role aspirant's desirability to be like the role model and therefore influences the level of role model motivation (Morgenroth et al., 2015).

Identification relates to the identification and embodiment of the role model's traits with that of the role aspirant's traits. Internalisation refers to the process whereby the role aspirant adopts the behaviour matching that of their own value system. Admiration refers to the desirable characteristics of the role model as perceived by the role aspirant, i.e. the role aspirants' desire to emulate the qualities of the role model. Morgenroth et al. (2015) proposed that desirability contributes to the value role aspirants attach to specific goals and to the adoption of new goals.

The findings from this research support the above references because following the role model intervention, 56 participants reflected that they identified with and saw similar traits to themselves in the role models (internalisation). As noted earlier, students reflected that they did not identify with the role model operating in the financial services sector as their start-up was not relevant to them because they were engineering undergraduates. One role model, *Role Model C*, stood out as someone the students could most relate to. A male in his 20s, CEO of an agricultural technology start-up, and recently graduated as a Mechanical and Electrical engineer. Of the 56 participants that reflected on identification and internalisation, 44 commented on how they could relate to *Role Model C*. These reflections discussed the role model being a similar age, a recent graduate, and discussed leaving a full-time job in a multinational to start his own business. All students had recently completed a six-month work placement, and some reflected on the mundanity of full-time employment and could relate to what *Role Model C* discussed. As highlighted by one of the participants, *"from all the talks given I was able to relate to him as an Engineer. I related to his experience as an employee of a biomedical firm. I could relate to the feeling of complacency he had at his time in [Multinational]. During my time in work placement as an intern for [Multinational] there were times I felt that the work organisation wasn't suited for me."* Three participants reflected that they saw specific traits in the role models that they did not see in themselves and as one reflected, *"I don't believe I have his interpersonal, leadership and marketing skills to reach his level of success"*.



Admiration “is elicited by people of competence exceeding standards” (Onu et al., 2016, p.16). Admiration plays an important function in social interaction and inspires us to learn from role models. Most studies measure admiration by asking participants to self-report on their admiration for an individual. According to Algoe and Haidt (2009), the motivational output of admiration is the inspiration to pursue one’s goals. This is more likely to occur when the position of the role model is attainable (expectancy). If a role aspirant admires a role model, then they are more likely to want to learn from that role model. Fifty-one students reflected on their admiration for the role models. Approximately 60% of the reflections on admiration focused on *Role Model A*, a male CEO in his 50s who went from one failed business to become a successful entrepreneur. Reflections focused on his determination to come back from a failed business to become a successful entrepreneur. Whilst students mostly identified with *Role Model C*, the greatest admiration was for *Role Model A*. As stated by one participant, “*the reason I admire Role Model A is due to his willingness to carry on having already failed with a different business. I also admired his initiative when trying to promote his business*”.

### **2.3.2 Female entrepreneurship and female role models**

Nine of the 82 participants in this research study were female. Therefore, statistically, it is not possible to make inferences on the effects that female role model/role aspirant gender matching or mismatching had on the effectiveness of the role model motivation. However, it is important to explore female entrepreneurship and the data from these nine female students to see if further investigation is warranted for future research studies in this area. An increased focus on the “untapped potential of women entrepreneurs” at a European and national level has resulted in many new initiatives aimed at encouraging women to consider entrepreneurship (Fitzsimons & O’Gorman, 2020, p.20). The concept of female entrepreneurship in literature is relatively recent; for example, the first article on the topic was published in 1976 titled “Entrepreneurship: A new female frontier” (Schwartz, 1976). Before that, entrepreneurship was a gender-neutral concept (Bruni et al., 2004). Schwartz’s article argued that it is no longer appropriate to use male entrepreneurs as the benchmark.

It is important to briefly investigate gender balance in the current Irish entrepreneurial environment to gauge if additional efforts are required to encourage female students to consider

entrepreneurship. Men are on average twice as likely as women to be in the process of starting a new venture which is consistent across countries (Acs et al., 2005) as can be seen in Figure 2 showing the differences between men and women in terms of established business ownership by gender in participating G7<sup>1</sup> and BRIC<sup>2</sup> countries. In Ireland, there are 1.8 men for every woman in early-stage entrepreneurship, compared to the OECD average of 1.5 men for every woman (Fitzsimons & O’Gorman, 2020). According to the National Policy Statement on Entrepreneurship in Ireland 2014, the gap has narrowed but there is scope for progress. It is therefore important to consider if female gender matching/mismatching is important when planning role model interventions.

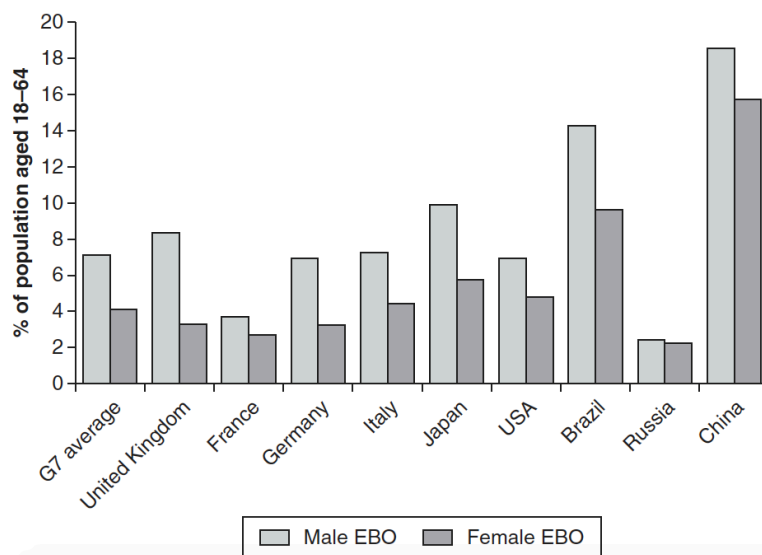


Figure 2: Established business ownership by gender in participating G7 and BRIC countries, 2009 (source: GEM, 2009, P. 25)

On further investigation of the quantitative data collected from the nine female participants, entrepreneurial intent (measured using Thompson’s IEIS) for female participants was higher than that of their male counterparts both before and after the role model lectures as outlined in Table 1. Five of the nine participants indicated the positive influence of the entrepreneurial

<sup>1</sup> The Group of Seven (G7) is an international intergovernmental economic organisation consisting of seven major developed countries: Canada, France, Germany, Italy, Japan, the United Kingdom and the United States, which are the largest IMF-advanced economies in the world.

<sup>2</sup> BRIC is an acronym for Brazil, Russia, India, and China. Goldman Sachs economist Jim O’Neill coined the term BRIC in 2001, claiming that by 2050 the four BRIC economies would come to dominate the global economy by 2050.

lectures, with two participants indicating that their intent had changed from not considering entrepreneurship to now considering starting a business if an idea or opportunity existed. As reflected on by one participant: *“My view on entrepreneurship was quite negative before these talks as I was not willing to consider taking the plunge and setting up a business due to the fact that I thought there were too many risks and that the success rates were small. You will see in this reflection that this view has now changed.”*

Lockwood (2006) examined the level to which gender matching of role models, and role aspirants influenced the effectiveness of role model motivation. She presented individuals to a successful role model who shared their career goals and either matched or mismatched on gender. Her study concluded that women are inspired by “outstanding” women in their area, but not by “outstanding” men in the same area.

### IEIS results by gender

Items	Average Intent Pre-Lect.	Average Intent Post-Lect.
All participants	2.83	2.91
Male participants	2.78	2.85
Female participants	3.24	3.37

Table 1: Entrepreneurial intent by gender pre-and post-entrepreneurship lectures (source: current research)

Lockwood (2006, p.41) concluded that “gender matching is important for women in determining their ability to map themselves onto a role model and view the model as an example of what they can become in the future.” Of the nine female participants, there was only one individual reflection on female role models. This participant reflected, *“Role model D was the entrepreneur I admired the most over the course of the five talks. In my opinion this was due to her being a female role model in the biomedical sector.”* The reflections of the female students were then examined further to look for evidence of female participants being inspired more by female role models over male role models. No evidence was found, contradicting Lockwood’s (2006) findings. Five of the nine participants discussed similarities between their personality traits and the personality traits of the entrepreneurs. All five reflected

that they could relate most with *Role Model C*, a male in his 20s, CEO of an agricultural technology start-up and recently graduated as a Mechanical and Electrical engineer. As posited by one of the female participants; “*Role Model C was an entrepreneur which I could most easily relate to for obvious reasons; he studied mechanical engineering in Limerick, and is younger than the other entrepreneurs. His talk was eye opening in that it showed that with a small bit of industry experience and a good idea, it is possible to be successful at a very young age. It was clear from the talk that he gave and the experience he shared that he was determined and headstrong, which is an important trait for an entrepreneur which I think I have as well.*”. Two of the participants internalised the traits of the two female role models (role model B and D) and discussed sharing their “*passion, strong work ethic, people skills, determination and competitiveness.*”

As discussed, due to the relatively low proportion of females partaking in the study, it is not possible to make specific female gender inferences on the effects that role model/role aspirant gender matching or mismatching had on the effectiveness of the role model motivation. But initial evidence suggests that the female students participating in the study were inspired by role models that they perceived to be similar in age and background rather than role models based solely on gender. This contradicts Lockwood’s (2006) findings and therefore warrants further research in future studies.

### **2.3.3 Focus on value vs. expectancy**

A regression analysis was performed to explain the relationship between the independent variables, overcoming barriers (expectancy) and value of entrepreneurship, and the dependant variable, entrepreneurial intent. The regression formula was calculated as:

$$\mathbf{Intent} = -0.328 + 0.38(\text{barriers}) + 0.629(\text{values}) + e$$

It was concluded from the quantitative data analysis that role model interventions focusing on the value of entrepreneurship had a greater influence on intent than interventions focusing on expectancy (for details, see Paper 4, section 5.2). On a further review of the qualitative data, there was approximately 48% more reflections on value than on expectancy (288 reflections

on expectancy vs. 426 reflections on value). Little evidence was found in recent literature to show that role model motivations focusing on value had a greater effect than those focusing on value. Eccles and Wigfield (2002) highlighted the need for research to investigate if expectancies and values relate differentially to performance and choice. This research study looks at motivating students to consider entrepreneurship, so it therefore concerned with choice.

According to early expectancy-value theories (Atkinson, 1957; Feather, 1982) individuals may not engage in a task if they do not perceive it has value, even though they may have a high expectation of success. This may in some way explain the importance that value plays in the motivation process. This can be seen from one student's reflection on the positive influence that the talks had on their perception of entrepreneurship value and its influence on their intent; *"Despite the challenge's entrepreneurs face, all 4 speakers highlighted the rewards of entrepreneurship. The talks opened my eyes to rewards that I had never thought about before. If personal inspiration sparks an idea for me then I would definitely consider this career path. In conclusion, my views on entrepreneurship have changed in a positive way."* On the contrary, another student reflected; *"None of the above-mentioned rewards would compel me to become an entrepreneur as the risks that come with these rewards are too high."* Students may believe that entrepreneurship is now more achievable with hard-work but if you do not value the rewards of the success, then the effort is not worth the reward. The focus of the entrepreneurship role model talks may therefore play a key role in the effectiveness of the intervention. Initial findings suggest that the main emphasis of the role model interventions should be on value. It is recommended that a measure be taken following each role model intervention so that this can be observed during the motivation process.

### **3. Role model entrepreneurial motivation questionnaire**

As discussed in earlier papers, Thompson's (2009) IEIS was the chosen entrepreneurial intent scale for this study. It was concluded from the study that the change in the mean was statistically insignificant which did not converge with the findings from qualitative analysis which found that approximately 70% of students indicated the positive influence that the role model talks had on their entrepreneurial intent. Other potential intent scales are proposed for the continuation of this research, including Franke and Luthje's (2004) and Liñán and Chen's (2009) entrepreneurial intent scales. Both scales look at intent, expectations, and attitudes towards entrepreneurship and may be better suited to this study.

A method to measure the role model influence on intention would greatly benefit future research in this area. An instrument to measure that intent and the variables in the model would be required. This instrument could be used to give a measure of the influence that model interventions had on motivating individuals to consider entrepreneurship. As part of this research, the researcher developed a questionnaire that can be adapted to create a "role model entrepreneurial motivation" questionnaire. Eighty-two students completed the questionnaire and initial results were generally satisfactory, with good validity and reliability. The two variables influencing intent were found to be "increasing expectancy by overcoming barriers" and "outlining the rewards and value of entrepreneurship".

Figure 3 presents a proposed role model entrepreneurial motivation model. An important element of the model will be a measure of demographic variables. These demographic variables should not affect intention directly, but could be very useful in identifying their effect on expectancy and value and will aid with investigating how generalisable the model is. It may also be important to at least check for, and consider the possibility, that expectancy and value may interact to influence intent (Lee et al., 2014; Nagengast et al., 2011). The items for the model are built on 5-point Likert-type scales. Table 2 presents the scale item questions for each variable, and the reliability analysis resulting from this study. Although these two variables could form the constructs explaining entrepreneurial intention, their relative contribution to this intention may change from case to case and further testing is required. This can be investigated further in future studies.

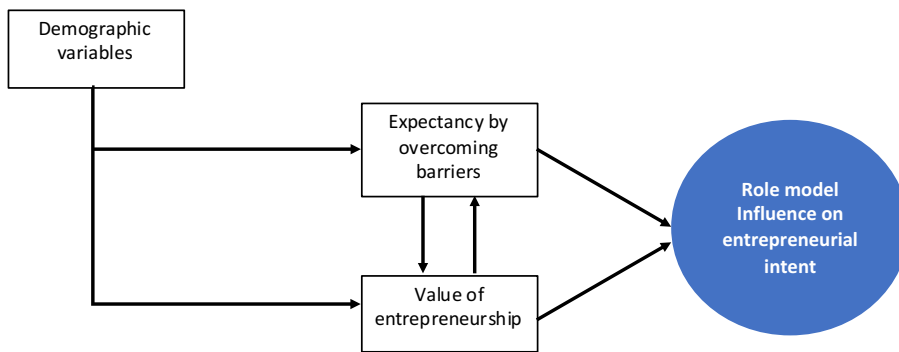


Figure 3: Role model entrepreneurial motivation model (source: current research)

Construct	Scale item question	Cronbach's Alpha	Factor Loading
<b>Expectancy</b>	1: The role models have overcome significant barriers to becoming an entrepreneur	<b>0.608</b>	.661
	2: I can overcome finance barriers as demonstrated by the role models		.828
	3: I can overcome my lack of experience as an entrepreneur as demonstrated by the role models		.749
<b>Value</b>	1: I would value being an entrepreneur more now than before	<b>0.642</b>	.847
	2: I have realised new rewards of being an entrepreneur		.748
	3: I would like to have the same rewards from a successful business as these entrepreneurs		.711
<b>Intent</b>	1: I would keep my options open and would consider starting a business in the future	<b>0.785</b>	.799
	2: I will attend more entrepreneurial talks in the future to gain additional knowledge		.771
	3: If I come up with a new idea I would now be more likely to investigate starting a new business		.727
	4: These entrepreneurial talks have made me reconsider my options and I would consider starting a new business in the future.		.535
	5: These entrepreneurial talks have motivated me to consider entrepreneurship in the future		.877

Table 2: Researcher's developed "Role model entrepreneurial motivation questionnaire" (source: current research)

#### 4. Proposed Framework

An objective of this study was to develop a framework for the use of role modelling intervention for the promotion of entrepreneurship as a career. Action research was initially ruled out as a methodology for this study due to the timescale of the DBA, which did not allow for the iterative process that is involved. Action research as “research that would help the practitioner” was first advocated by Lewin (1946, p. 34). Lewin (1946) developed the theory of action research and the action-reflection cycle of planning, acting, observing and reflecting. This was then extended into recurring action reflection cycles as shown in Figure 3.

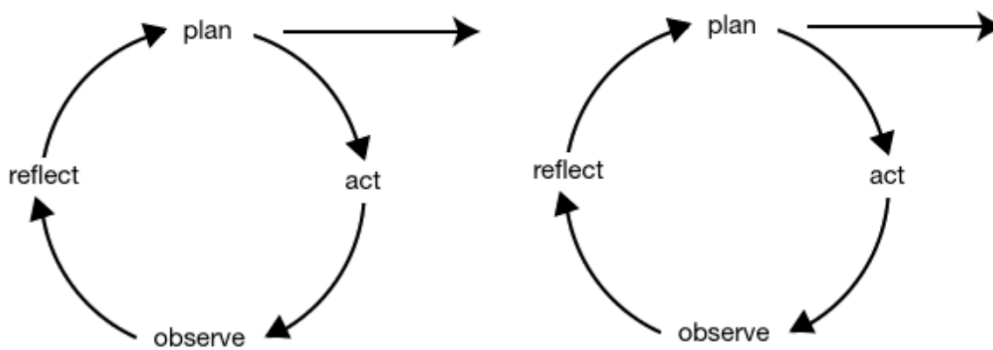


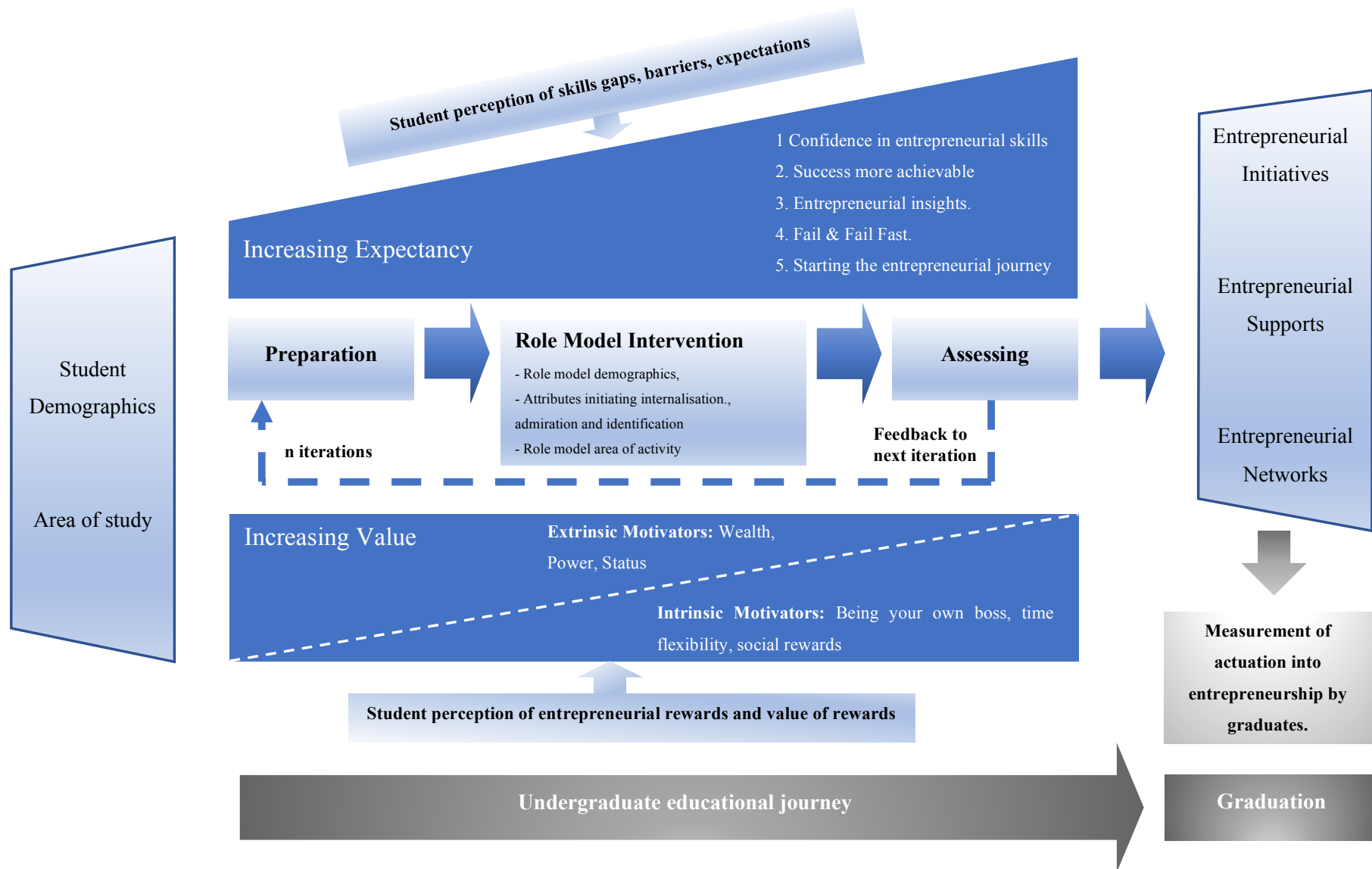
Figure 4: Sequences of action reflection cycles (Lewin, 1946)

Similarities exist between the mixed-methods methodology used in this study and action research methodologies, as in both approaches, quantitative and qualitative data are collected in one study (Creswell & Clark, 2017). Action research can incorporate a number of iterations but can also incorporate a number of different methods for data collection, particularly in the diagnosing and evaluation phases methods (Ivankova, 2014; Lingard et al., 2008; McNiff & Whitehead, 2011; Munhall, 2012; Reason & Bradbury, 2001). A mixed-methods action research (MMAR) framework was used for the development of the framework for future studies, as this study will not be restricted by the time constraints of a DBA.

The proposed framework, shown in Figure 5, has been created based on the findings of this research study and developed to make use of a MMAR methodology. The framework can be used throughout the students’ undergraduate educational journey and will be presented following the MMAR stages.



Figure 5 – Proposed framework for the promotion of entrepreneurship (source: current research)



*Preparation phase (Plan):* The demographics and area of study of the participants are first recorded, and this will set the scope of the role model intervention. It is proposed that the framework can be used for students in different disciplines, with role models operating in a field relevant to that discipline. The preparation phase includes an initial investigation to measure entrepreneurial intent at a given point in time (e.g. at the start of each academic year), to determine entrepreneurship attitudes, and to gather student perceptions of entrepreneurial skills gaps, barriers, and expectations. Student perception of entrepreneurial rewards and the value of those rewards are also determined.

*Role model intervention phase (Act):* The information gathered at the preparation phase will inform the role model intervention phase (i.e. role model lectures). The role models will be chosen based on the demographics of the students involved and will be active in an area relevant to the discipline undergoing the role model intervention, e.g. in the case of engineering students, role models should be operating in a technical area. Role model attributes should initiate internalisation, admiration, and identification. One of the main findings from the study was that students internalised the traits of the role models and identified with role models of a similar age and educational background. Another finding was that students admired these role models of similar age and background and role models that were enthusiastic and in the early stages of entrepreneurship.

The role model interventions will primarily focus on the value of entrepreneurship as, based on the current research, interventions focusing on value have a greater influence on intent than interventions focusing on expectancy. Student perceptions of entrepreneurial rewards and the value of these rewards should inform the value focus of the role model lectures. Based on the findings of this study, the role model lectures should discuss the intrinsic value motivators such as being your own boss, time flexibility, and the social rewards of entrepreneurship. Extrinsic incentives should also be discussed if the motivation is to be maintained (Good & Brophy, 1990). The optimal entrepreneurial motivation will therefore occur when students surmise that both their extrinsic needs and intrinsic needs can be fulfilled.

Student perception of skills gaps, barriers to entrepreneurship, and expectancies of success will inform the expectancy focus of the role model lectures. Based on the findings of this study, the

role model lectures will initially focus on five topics related to expectancy; confidence in entrepreneurial skills, success being more achievable, entrepreneurial insights, the concept of “fail and fail fast”, and the timing of starting the entrepreneurial journey.

*Assessing phase (Observe):* The assessment phase will again measure entrepreneurial intent after the role model lectures. The “role model entrepreneurial motivation” questionnaire, developed as part of this research, can be used to measure the effectiveness of the role model intervention. This study found that student reflection offered detailed insight into how the role models influenced intent and gave an indication as to the effectiveness of the interventions. It is proposed that the assessing phase will include student reflection. This will also give students the opportunity to shape further role model interventions by reflecting on what role models they would like to speak at future lectures.

*Reflect and repeat:* Feedback from the assessment stage following a role model intervention can inform the preparation for the next cycle. It is suggested that one cycle could happen each academic year as approximately half of the students in this study reflected that they would like to attend more lectures. This would also give an indication as to the change in intent as students get closer to graduation and are considering their career options. It is also important to note that the framework can be adapted for different cohorts of students with a constant data flow to optimise the effectiveness. Following the process, and after graduation, it is proposed that participants will have the option to further investigate entrepreneurship as a career. Entrepreneurial initiatives, entrepreneurial supports, and access to a network of entrepreneurial role models can further accentuate the influence of role models. Finally, an important element of the framework will be the measurement of actuation into entrepreneurship by graduates, as this will give an indication to the effectiveness of the framework over time.

## 5. Summary of findings

As outlined in the discussion, and linking to the four propositions of this study, role models were found to positively influence students' entrepreneurial intent by increasing their expectancy of success, and the value of that success. Role models were found to increase students' perceptions of their own entrepreneurial skills and their perception that entrepreneurial success is achievable. Evidence from both the quantitative and qualitative data suggests that the role models demonstrated to students that they can overcome barriers to entrepreneurship with access to start-up and financial supports and by lessening the inhibition caused by fear of failure. Students also reflected on new found knowledge insights into entrepreneurship and what it takes to be a successful entrepreneur.

The effectiveness of the intervention can play an important role in maximising the influence of the role models. Evidence suggests that role model interventions focusing on the value of entrepreneurship have a greater influence on intent than interventions focusing on expectancy. Reflections on admiration, personal identification, and internalisation of role model qualities suggest these factors play a key role in increasing the motivating influence of the entrepreneurs. Students admired enthusiastic role models that are still in the early stages of entrepreneurship or have overcome adversity to become successful entrepreneurs. It was also a finding of this research that students internalised the qualities of the role models having a similar educational background to them. They also identified most with these role models as they talked about the advantages of starting your own business over working for a large multinational. Many students having completed work placements in similar companies identified with these reflections and the associated benefits with starting your own company.

Conclusions from the implementation of the proposed framework cannot be made at this stage, as the framework has yet to be implemented. But the findings from this study can inform potential users how to use the framework most effectively. By recording student demographics and discipline at an early stage, role models can be selected in a way to maximise the effectiveness of the interventions. Student input on entrepreneurial perceptions of expectancy and value before the interventions can assist with directing the role models on the topics they should focus on to maximise the effectiveness of the interventions. From the data analysis, it

is evident that students reflected on comparisons and contrasts between the role models. This helped to reinforce their attitudes towards entrepreneurship. Forty-percent of students indicated that they would like to attend more entrepreneurial talks in addition to the four or five talks they attended. The framework could therefore be used throughout the students' educational journey, and the intervention can be reiterative with feedback from each loop informing the next iteration. It is proposed that these iterations would further strengthen the influence resulting from the interventions.

The discussion has outlined the findings of this research study and these findings will now be summarised into an all-encompassing table providing easier reference for the reader. The table links the findings to the original research objectives and validates the findings based on these objectives. The summary of findings is presented in Table 3 below.

<b>Objective 1: Investigate how role models can be used to motivate students to consider entrepreneurship as a career.</b>
#1: Role models increase students' entrepreneurial intent by increasing their expectancy of entrepreneurial success.
#2: Role models increase students' entrepreneurial intent by increasing their perception of their entrepreneurial competencies.
#3: Role models increase students' entrepreneurial intent by highlighting the rewards of entrepreneurial success and by demonstrating new rewards e.g. social rewards.
#4: Role models demonstrate to students that they have access to start-up supports and can overcome perceived barriers to entrepreneurship.
#5: Role models lessen the inhibition caused by fear of failure.
#6: Role models give students new knowledge insights into what is required to become a successful entrepreneur.
<b>Objective 2: To understand how role model interventions can be most effective in motivating students to consider entrepreneurship as a career.</b>
#7: Role model interventions focusing on the value of entrepreneurship have a greater influence on intent on intent than interventions focusing on expectancy.
#8: Admiration, personal identification and internalisation of role model qualities increase the effectiveness of role model interventions.
#9: In order to initiate identification and internalisation, role models should come from a similar educational background or discipline.
#10: Students admire enthusiastic role models that are still in the early stages of entrepreneurship or have overcome adversity to become successful entrepreneurs.
<b>Objective 3: Develop a framework for the utilisation of role modelling intervention for the promotion of entrepreneurship as a career.</b>
#11: By recording student demographics and discipline at an early stage, role models can be selected in a way to maximise the effectiveness of the interventions.
#12: Student input on entrepreneurial perceptions of expectancy and value prior to the intervention can guide choice of role model and the topics they cover.
#13: The framework can be used throughout the students' educational journey and the intervention can be reiterative with feedback from each loop informing the next iteration.

Table 3: Summary of findings (source: current research)

## 6. Contribution to knowledge

This study is positioned in the field of entrepreneurship motivation and intentions. This research study contributes to our understanding of how role models can be used to motivate students to consider entrepreneurship and addresses previous calls for research in this area (Bosma et al., 2012; Morgenroth et al., 2015; Van Auken et al., 2006; Zellweger et al., 2011). By applying mixed-methods approach, it can be concluded that role models influence entrepreneurial intent by a mechanism of increasing expectancy of success and the values of the rewards of that success. This study is novel in that it deliberately uses role model interventions to motivate students to consider entrepreneurship. It also makes recommendations on how to use role models most effectively. Other studies in this area typically investigate role models within an individual's network without attempting to introduce new role models. The study also explores the matching of role model and role aspirant, a failing in many previous studies (Bosma et al., 2012).

The study suggests that role model interventions are most effective when students admire the role model, identify with the role model, and internalise the traits of the role model supporting previous literature in this area (Lockwood et al., 2002; Morgenroth et al., 2015; Zirkel, 2002). The role model that had the greatest impact on intent was similar in age, had the same educational background, and talked of "getting off the bus" of working for a large multinational. This resonated with students. Other inspiring role models were those that had overcome adversity to now have a successful business, and role models making a contribution to society. The study also suggests that gender matching and mismatching of role models had no influence on the effectiveness of the intervention. Female students identified most with role models of a similar age and educational background and not based on gender.

This study also supports previous evidence that role models can have an important influence on career development. Literature in the career planning field has found that role models are important in influencing individuals' career objectives (Douglas & Shepherd, 2002; Krueger et al., 2000; Scott & Twomey, 1988). The results of this study are consistent with these previous studies. According to Low (2005), graduates will typically commence working for others before they leave to start their own entrepreneurial activity, but now, following words of

wisdom from these entrepreneurs, students reconsidered a career in entrepreneurship and questioned when they should start their entrepreneurial journey.

Finally, this study contributes to theory by testing the motivational theory of role modelling (Morgenroth et al., 2015). This theory has been cited in numerous studies, but a review of the literature found no evidence of successfully testing the theory on the use of role models influencing entrepreneurial intent. This research study finds that role model interventions can influence entrepreneurial intent by increasing expectancy of success and the rewards of entrepreneurial success. The underlying theory of this study, the motivational theory of role modelling (Morgenroth et al., 2015) holds, i.e. role models can be used to increase role aspirants' motivation by influencing expectancy (attainability) and rewards (desirability).

## **7. Contribution to practice**

As far as the practical implications of the study are concerned, the current findings and developed framework can be useful for those involved in motivating individuals of to consider entrepreneurship, those involved in career guidance and development, and those developing policies to promote entrepreneurship. This research presents a framework for motivating individuals to consider entrepreneurship. This study took place in an educational setting with a sample population of fourth-year engineering students. The framework can be used within an educational setting if there is a requirement to increase entrepreneurship, as was the case in the researcher's own HEI organisation. The framework can also be used to motivate individuals consider entrepreneurship in the future, with a recommendation to choose role models of a similar age and operating in a similar field. The study presents the "Role model entrepreneurial motivation questionnaire" that can be used to measure the effectiveness of role model interventions. The framework can be iterative, and the role model interventions can be assessed at the end of each iteration to inform the selection of the role models for the next intervention. The questionnaire can be used to measure the influence the role models have after each iteration.



This research can also assist those involved in career guidance and development in particular to broaden an individual's options and to highlight the advantages of being self-employed. Entrepreneurial literature commonly discusses business knowledge and work experience as antecedents for entrepreneurial success (Robinson & Sexton, 1994; Unger & Homburg, 2006). Two interesting insights highlighted from the student reflections were the advantages of starting the entrepreneurial journey before family commitments and responsibilities and after gaining industrial experience. Students reflected that they would both like to gain industrial experience but would see the advantage of starting a business at a young age. According to Eccles and Wigfield (2002), all choices are assumed to have costs associated with them, as one choice may rule out other options. In the case of choosing entrepreneurship as a career path, students eliminate the option of regular employment and the security of a known salary. Cost is related to the negative aspects of choosing entrepreneurship, i.e. will I be able to perform the task, will I fail or succeed, how much effort will it require and what are the lost opportunities of me making this choice (Eccles & Wigfield, 2002)? Subsequently, the choice they make depends on the relative value and probability of success (Eccles & Wigfield, 2002). Role models can increase the perceived probability of success and the value of that success, reducing the relative cost of choosing entrepreneurship as a career. Azoulay et al. (2020) highlight the advantages of commencing entrepreneurship at young age versus when older. They argue that young entrepreneurs have many advantages, including being cognitively sharper, less distracted by family or other responsibilities, and more capable of transformative ideas. The disadvantages are less access to human capital, social capital, or financial capital. If role models can be used to show students how to gain access to these, then maybe they can consider entrepreneurship after graduation or at earlier stages in their careers.

This research can therefore also contribute to policy development to promote entrepreneurship. Role models can play a key part in educating potential entrepreneurs about the financial and start-up supports available to them. They can also educate potential entrepreneurs of the rewards of entrepreneurial success. One suggestion would be to develop a mentorship programme or "entrepreneur's apprenticeship". One such programme was introduced in Finland in 2000. The entrepreneur studying through an apprenticeship chooses a mentor that will commit to guiding and supporting them to meet their aims and objectives. The mentors share their knowledge and experience with the entrepreneurial apprentice. The programme has

been hugely successful, with numbers increasing from 450 to 5,400 in the first decade of its existence (Miettinen & Viinisalo, 2011).

Another finding from this study was that role models can reduce perceived barriers to entrepreneurship, including “fear of failure” and this can also contribute to entrepreneurship policy. Four in ten Irish people identified “fear of failure” as a barrier to entrepreneurship (GEM Survey of Entrepreneurship in Ireland, 2016). In 2013, the European Commission published the “Entrepreneurship Action Plan 2020”. The plan included a chapter in the report titled “Turning Failure into Success: Second Chances for Honest Bankrupts”. The action plan discussed the requirement to nurture an entrepreneurial mindset as a society that embraces “honest” failures (European Commission, 2013). Role models can be used to nurture that entrepreneurial mindset. Isenberg (2011, p.36) recommends that we need to “turn failure into fodder”. He argues that true innovation involves risk and that it is imperative to teach entrepreneurs to “fail small, fast, and cheaply.” Role models can play a key part in addressing this fear of failure and getting the message across that is ok to fail and if you do so it better to “fail fast”, reflect, and start again.

## **8. Limitations**

A limitation of a research study design is “the systematic bias that the researcher did not or could not control and which could inappropriately affect the results” (Price & Murnan, 2004, p.16). Three critical limitations were identified; Firstly, the research took place in one HEI organisation and with one cohort of students. Secondly, the research took place over one semester potentially leading to a “hot stone” effect. Thirdly, students’ responses may be influenced by the fact that they were giving feedback on an activity organised by their lecturer (the researcher) as part of their module. These limitations will now be discussed along with a justification for the decisions taken as part of the research design.

### **8.1 The research took place in one HEI organisation with one cohort of students**

The researcher had to compromise between two choices; a large-scale study across multiple HEI’s with multiple cohorts of students or a small-scale study in one HEI with one cohort of

students. A large-scale study would offer greater generalisability, but extraneous variables would be difficult to identify and control. By choosing students within the researcher's own HEI, the extraneous variables were more identifiable, and could therefore be reduced and controlled. But this introduces a limitation in that the study is less generalisable.

## **8.2 The duration of the research**

A common threat to validity and reliability occurs when the researcher collects results at different points in time due to the introduction of extraneous variables. For example, while an intervention is being conducted, there may be a simultaneous event going on that affects or contaminates any changes in results pre-and post-intervention. The change caused by the extraneous variable may be mistakenly attributed to the intervention (Price & Murnan, 2004). In this research study, entrepreneurial intent needed to be measured prior to and after the role model intervention. The research examines if role models increase students' entrepreneurial intent by increasing their expectancy of entrepreneurial success and value of entrepreneurial success. If the measurement is taken over a long period of time, extraneous variables may be introduced. Entrepreneurial education has been shown to influence entrepreneurial intent (Autio et al., 2001). The time taken to administer the study and the implications on the validity and reliability of findings needed to be considered.

A study over a short time frame may be like throwing water over a hot stone. The impact of intervention may be short-lived. If participants were evaluated after 12 months results would possibly be different, but a longer timespan introduces extraneous influences. If students were to undergo an additional entrepreneurial focused module at the same time as the study is taking place this may influence the intent external to the study, i.e. not due to role model intervention. Originally, it was proposed to use an experimentation methodology whereby one experimental group of students would undergo an intervention and the control group would not. The results of the experimental group and control group could then be compared to exclude the effect of extraneous influences on intent. This was ruled out as it was deemed unethical to give one group a different learning experience. The researcher believed that the best compromise was that the study take place over a 12-week period but this limitation should be noted.

### **8.3 Activity organised by students' lecturer (researcher) as part of their module**

A potential limitation was the possibility that students' responses may be influenced by the fact that they were giving feedback on an activity organised by their lecturer (the researcher) as part of their module. They may feel it necessary to give positive feedback. To minimise this effect, it was made clear to students that participation in the study was entirely voluntary and students had the option to withdraw at any time. Fourteen students indicated that the lectures had no influence on their entrepreneurial intent and 8 students indicated the negative influence the lectures had on their entrepreneurial intent, indicating that students did not feel obliged to give positive feedback and felt they could give truthful feedback. One interesting observation was that even though students were only required to attend four of the five lectures, approximately 60% attended all five lectures. This indicated the students' genuine interest in what the role models had to say and further strengthens the argument that the study showed internal validity.

### **8.4 Limitations conclusion**

Limitations will always exist, and it is an important element of any research study to report such limitations. As outlined by Price and Murnan (2004), researchers should be sceptical of the validity and reliability of any single study. The validity and reliability of the original findings can be improved by repeating the study with other participants in different settings. Recommendations to address some of these limitations will now be discussed in the discussion on further research.

## **9. Further research**

This research study focused on how entrepreneurial role models can be used to increase students' (role aspirants) entrepreneurial intent. The research indicates that role model interventions can influence entrepreneurial intent by increasing expectancy of success and the rewards of entrepreneurial success. Eighty-two CIT fourth year Biomedical and Mechanical Engineering students (male = 73, Female = 9) with an average age of 22.7 years (SD =3.3) consented to participate in the study. It would be meaningful to extend the study to other

disciplines to test the generalisability of the findings. The existing study could be also adapted and replicated in other institutions both nationally and internationally.

### **9.1 Longitudinal study throughout the educational journey**

The proposed framework presented in this paper offers several avenues for further research. The subject area would benefit from wider research, in particular, a longitudinal study to better understand how role models can influence entrepreneurial intent of students throughout their educational journey (from 1<sup>st</sup> year through to graduation). The framework is developed in a way that it can be iterative with the outcome of the assessment stage used to inform the next iteration. It is proposed that a role model intervention could take place each academic year, and entrepreneurial intent could be measured at the beginning and end of each academic year. The research could look at what stage is the role model influence on entrepreneurial intent most pronounced and what other external influences may be at play.

### **9.2 Influence of gender matching on role model influence**

Further investigation could also be carried out to examine the influence that gender matching has on role model influence. Lockwood (2006) concluded that women are inspired by “outstanding” women in their area but not by “outstanding” men in the same area. The study suggested that female participants did not reflect that they could relate more to female role models, but they did reflect that they could relate to a recent engineering graduate of a similar age. This finding could be investigated further by increasing the sample size of female participants. Nine of the 82 participants were female and as numbers of female students increase, as is the current trend (21 female students will undertake the same module the following year), further opportunities may exist to investigate this finding.

### **9.3 Influence of role model background matching on role model influence**

There was some evidence found to suggest that role aspirants relate better to the role model when they are operating in an area that they can see themselves in the future. Many students

reflected that one of the role models was “uninspiring” and that they could not relate to this role model as her start-up was not relevant to them. This role model differed from the other four role models in that her business was a financial services IT start-up, while all other lecturers were technical or engineering-related. This finding may require further investigation to see if the same reflection is observed for other disciplines. Would finance students make similar observations if attending role model talks from engineering-related entrepreneurs?

#### **9.4 Other dimensions worth exploring**

Other dimensions may be worth exploring in further research studies. One new-found reward that students indicated had an intrinsic value was the social entrepreneurship reward i.e. the reward of benefiting society and was reflected on by approximately a quarter of students. A further investigation could look at role model interventions utilising entrepreneurs working in areas that offer social rewards and to explore how it affects entrepreneurial intent by increasing the value of entrepreneurial success. To “fail and fail fast” was a common insight from the entrepreneurial talks. With approximately half of all students reflecting on their attitude to failure changing as part of the lectures, it suggests that this can play a key role in entrepreneurial motivation. “Fear of failure both inhibits and motivates entrepreneurial behaviour and therefore represents a rich opportunity for better understanding entrepreneurial motivation.” (Cacciotti et al., 2016, p.302). A further investigation could look at role model interventions, focusing on overcoming the fear of failure to explore how it affects entrepreneurial intent by increasing the expectancy of entrepreneurial success. Another interesting insight warranting further investigation was student observations on the advantages of starting their entrepreneurial journey before family commitments and responsibilities and after gaining industrial experience. Students stated that they would both like to gain industrial experience but would see the advantage of starting a business at a young age. One option would be to offer students the opportunity of starting their own business, in lieu of, or in conjunction with, undertaking industrial experience. This would further enforce their belief that they have access to the entrepreneurial capital required to be successful. Observations could then be made on the effect that this activity has on their entrepreneurial intent and their decision on when to start their entrepreneurial journey.

## 10. Concluding remarks

This thesis has offered a deeper analysis into the mechanisms involved in role model entrepreneurial motivation. Three themes emerged from the qualitative data analysis, including expectancy of success, value of success, and the effectiveness of the role model intervention. These themes were further reinforced by the quantitative data analysis which found that by increasing expectancy of success and the value of that success, role models can positively influence entrepreneurial intent. This study differs from other studies in this area as it uses role model interventions to motivate students, i.e. role models are selected and introduced to students through entrepreneurship lectures. Other studies investigate role models already present in a students' network without introducing new role models. The three objectives of this study have been met; to investigate how role models can be used to motivate students, to understand how role model interventions can be most effective in motivating students, and to develop a framework for the use of role modelling intervention for the promotion of entrepreneurship as a career.

The research has contributed to knowledge and practice, and the next step is to disseminate the findings. From a practice perspective, the researcher will share the findings with the ACE consortium in CIT to discuss the broader use of the framework across the institute. In addition to this, it is intended that a paper will be prepared for submission to the Babson College Entrepreneurship Research Conference (BCERC) 2021 and publication in Babson's "Frontiers of Entrepreneurship Research". It is also proposed to target academic journals in this field such as the "Journal of Entrepreneurship" which includes calls for papers investigating entrepreneurial motivation with a specific requirement to overlap theory and practice. It is also hoped that as the researcher develops his research skills and continues research in this area that future papers may be published in the top-ranking journal, "Entrepreneurship: Theory and Practice".

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# **Section 4:**

# **Reflective log**

# **extracts**

## Introduction

Costley et al. (2010, p. 116) suggest that “how professionals and practitioners regard themselves and their work situations, is a vital and rich source of data”. Keeping a reflective log is therefore a very important part of the DBA process as it helps to lay the foundations for roles as both practitioners and researchers. As posited by Moon (2004) it is possible to learn the skill of reflection. Reflection is “a tool for promoting learning and higher order thinking skills, developing professional practice and facilitating and structuring learning through experience” (Coulson & Harvey, 2013, p.401). The terms ‘reflective’ and ‘reflexive’ are often used interchangeably but it is important to differentiate the two. Fulton et al. (2013, p.37) describe reflection as a “careful and deep analysis of past events” and reflexivity is commonly recognised as being “deeper than reflection, being very self-aware in order to find a way of stepping outside yourself and being self-aware of your own values, prejudices and limits and ensuring that you act in full knowledge of why you are doing something “. Reflective practice involves including reflection within your everyday practice, and using the reflections to shape what you do on a day-to-day basis (Fulton et al., 2013, p. 37). Maintaining a reflective log was initially seen as a requirement of the DBA process but quickly became a valuable tool that aided the researcher and acted as a source of encouragement during the learning journey.

The following section outlines some of the researchers own reflections throughout the doctorate programme and offers the reader some insight into what was learnt along the way and how these learnings are being utilised in the researcher’s everyday working life. Due to the personal nature of reflections, it seemed appropriate that the following sections are written in the first person.

### A daunting new beginning

**29<sup>th</sup> September 2016:** *“Today was a daunting new beginning. The start of my journey as a researcher. I must also ask myself what are the skills I need to develop to be a more proficient researcher. We have been asked to complete a professional development plan. For me this was an eye opener to all that is involved and to where the gaps in my skills will be. But more importantly it will give me a plan to address those skills gaps.”*



The purpose of the Professional Development Plan (PDP) in the context of the DBA was to map my career as a researching professional and allowed me to articulate my vision for the DBA. It offered an initial guide to achieving my DBA goals. The PDP was a living document to be used for the duration of the research study and provided a plan to address the gaps in my research skills and research knowledge. In terms of reflective practice, it offers me a process of reflection and structured planning on how you to meet my own professional and research goals. It also aided in honing my critical thinking skills and to address the challenges creatively.

### **Research topic identification**

**30<sup>th</sup> September 2016:** *“If I am going to spend the next four years of my life working on a research topic, then it should be a topic that brings me enjoyment. If this study is going to consume my working life, it should also be a topic that aids in my professional development. Currently I am heavily involved in entrepreneurship modules. I see very innovative students with great ideas, building high quality prototypes, and developing excellent business plans. But these innovative students are the first to be hired onto multinational graduate training programmes. It seems a waste of entrepreneurial talent. Maybe these students will not consider entrepreneurship straight after graduation but maybe in a few years’ time, after seeing what is achievable and the rewards involved, they will consider setting up a business.”*

Early reflections focused on the personal and professional rationale in choosing a research topic. I wanted to find an area that I could derive some intrinsic value from and that would also aid in my professional development. I saw first-hand the great innovative talent of students but also had a sense of frustration that none of these students considered entrepreneurship as a potential career. Originally the idea was to persuade more students to become entrepreneurs. It became evident very quickly that if the success of the DBA was to depend on more students choosing entrepreneurship, then the process was destined to fail. Instead, as guided by the supervisors, a suitable construct was required. This construct was entrepreneurial intent. The focus was now to influence students’ entrepreneurial intent so that they would consider entrepreneurship after graduation, or at some point in the future.

## **Broad or narrow research scope?**

**04<sup>th</sup> March 2017:** *“I would like to look at how role models can be used to motivate students. Should I look at the broad influences that role models can have on entrepreneurial intent? I believe this may be too close to current literature and there may not be enough of a gap to justify this. I cannot find any evidence of having a direct role model intervention and then looking at the effects of that intervention. I am also finding it difficult to define the boundaries of my study. If I make the research study too broad it may not be achievable as part of the DBA. If I make the study too narrow then my results may not be generalisable and I may not meet the level 10 learning outcomes of the DBA. Should I look at an international student survey, a national student survey, or look at students within my own organisation?”*

A review of the literature found evidence of many factors influencing entrepreneurial intent including social influence, cultural influence, gender, and entrepreneurial education. Another common theme in the literature was the influence of role models on entrepreneurial intent. Three streams were evident. The first stream related to the effect of parental role models. The second stream related to how networks and peer groups provide role models that influence the decision to become an entrepreneur and the third stream of research indicates that role models are associated with the environment that an individual is operating in. As seen in the three streams outlined, no evidence of utilising role model interventions to motivate students to consider entrepreneurship was found. This gap in the literature became an area for further investigation. The level of entrepreneurial education may affect entrepreneurial intent and again varying levels of entrepreneurial education across different institutes may affect the validity of a large-scale study. A small-scale study minimises the number of extraneous variables. For example, studying 100 students from one educational institution offered greater control of extraneous variables than studying 10 students from 10 educational institutions with differing degrees of entrepreneurial education and educational quality.

## **Drowning in information and papers**

**06<sup>th</sup> January 2018:** *“I am finding it difficult to narrow my literature review. As I dig deeper into a paper I am thrown in many different directions and often overwhelmed with data overload. I need to find a strategy to find the most relevant papers quickly and concisely.”*

At this point in the study, I found that my research skills were still in development. It was easy to become overwhelmed by the large body of literature in the area of entrepreneurship. A strategy was developed where the researcher ranked journals using the Scimago Journal & Country Rank (SJR) and then looked for the most cited articles in those top-ranking journals.

## **Philosophy and methodology**

**20<sup>th</sup> September 2018:** *“My philosophical position should drive my methodology. But what is my philosophical position? Following the philosophy workshop, I have read many papers on research philosophy. It was not until I read a Noblit and Hare (1988) statement that positivists seek cause and effect laws that are appropriately generalisable, so that knowledge of past events can predict future events, that I truly knew my philosophical position. This ties in strongly to my engineering background and previous research I have undertaken. But if I am a positivist should I utilise a quantitative philosophy? Can qualitative methodologies be applied by positivist researchers?”*

At this stage in the study, I reflected on my philosophical positioning and how it should link into the methodology of my study. Noblit and Hare (1988, p.12) state that positivists “seek cause and effect laws that are sufficiently generalisable to ensure that a knowledge of prior events enables a reasonable prediction of subsequent events” and this statement, reinforced by the researchers engineering background, firmly puts them in the positivist paradigm. I was more comfortable with quantitative research methods but I felt that relying solely on quantitative methods might limit my findings if the data did not support my hypotheses. By incorporating qualitative methods, I would be able to dig deeper into the qualitative data to find why the data was leading me to a certain conclusion. I decided on a mixed-methods methodology as I felt this would assist on two fronts. Firstly, I would be able to look at the

results from the quantitative and qualitative data and see if the results would converge. Secondly, I would take myself out of my comfort zone and would enhance my research skills in the process. Thematic analysis (Braun & Clarke, 2006) involves identifying, analysing, and reporting themes and is one of the most commonly used data analysis methodologies (Guest et al., 2011; Thomas & Harden, 2008). I found that the process aligned with my positivist underpinnings as it is systematic and transparent. On reflection, I am extremely happy that I took this path and now feel more confident in my qualitative research skills.

### **Philosophy and methodology**

**19<sup>th</sup> November 2019:** *“Today was the last day of the role model lectures. There is both a sense of satisfaction and fulfilment from these lectures. Students were asked to attend four of the five lectures but more than 60% of students attended all five. This showed a genuine appreciation for the role models. The questions and answers session, following each lecture, also indicated the students interest in what the role models had to say. I am now excited to review their reflections.”*

At the start of my reflective log, I commented on finding a research topic that I could derive some intrinsic value from. The role model lectures have convinced me that I made the right choice. It was a very rewarding experience and the feedback from both the entrepreneurial role models and the students has been excellent. In total 82 students reflected on the role model lectures. Approximately 70% of students indicated the positive influence that the role model talks had on their entrepreneurial intent. In general, students found the entrepreneurial talkers to be inspirational and motivational with one student commenting *“I think that their motivation and inspiration have shown me that becoming an entrepreneur is challenging however possible and an enriching job.”*

## **Impact of the research on the individual and the professional**

**08<sup>th</sup> December 2020:** *“When I ask myself the question, “how has this research impacted me as the individual and the professional?” I reflect on how my attitude to research has changed over the course of the DBA. Initially, my primary objective was to complete the doctorate without giving any thought to publications. But now I have an aim to disseminate the findings of my work and to develop as a researcher. Also, whenever starting new initiatives I immediately think about collecting data and recording the impact of those initiatives.”*

I still believe I am developing my research skills and hope that over time I can disseminate my research in top ranking journals. Initially, I hope to target journals such as the “Journal of Entrepreneurship” and eventually, as I develop my research and academic writing skills, to target top-ranking journals such as, “Entrepreneurship: Theory and Practice”. I also now have a better understanding of positioning my research at the beginning of a research study. In the future, I also hope to look at the influence that entrepreneurship education has on entrepreneurial intent. I have started a longitudinal study looking at the intent of all engineering first-year students within my organisation with an aim to measure their intent throughout their educational journey.

## **Concluding Comments**

I began my DBA journey in September 2016. Looking back at my reflective log extracts, I can see the challenges I faced along the journey and how I overcame them. This has given me great confidence in my research skills and I am already undertaking my next research study. I have learned greatly from the workshop lecturers and in particular from my supervisors. They were as strong in critique and guidance as they were in their encouragement. Originally, I completed my reflective journey as a requirement for the DBA. I found it difficult, to begin with, but I have come to learn its importance in my personal and professional career and it is something that will continue to play a key role in the future. On reflection, I was very hesitant about my research skills and my ability to complete the DBA. But ultimately, I found the process to be a very rewarding one. As a great man once said; *“Aim for the sky and you'll reach the ceiling. Aim for the ceiling and you'll stay on the floor.”*

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