Exploring existential interventions that enable competency development in Information Systems students

By

Saba Ryan Rahimi

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Supervisor:

Elsje Scott

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STUDENT NAME: Saba Rahimi

STUDENT NUMBER: RHMSAB001

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Abstract

The Information Systems field is one characterised by constant debate about its central focus and lack of a defined identity. This debate has perpetuated as the field constantly changes its identity in response to rapid and often turbulent technological advances. By attempting to study humans, computers and the results when humans and computers interact, the field covers a vast intellectual territory. This vastness causes inconsistent focus and different prioritisation across geographic regions, academic institutions and industry entities. In contrast to established fields, where curricula are relatively standardised, Information Systems' curriculum has traditionally been slow to respond to industry needs, generic in nature and has served as a guideline rather than an authoritative truth. This research is concerned with how the nature of the field affects Information Systems students and graduates, and seeks to investigate how learners can contend both the with vastness of the subject matter and the lack of authoritarian guidelines. The theory of existentialism is presented as a possible philosophy that can be instilled in students to help them contend with the nature of the field. Through the gathering of personal accounts from graduates and Graduate Recruitment Officers, this research assesses how students have grown in academia and moved past the challenges of adaptation to industry. In this endeavour it confirms that existential interventions are necessary tools that can be instilled in practitioners to help them contend with the unstable and ever changing nature of the field. In addition, teamwork or the first team experience is determined to be a fundamental event in identity formation. Lastly, significant specialisation change, otherwise called role movement, is identified during this time and could be the subject of further research.

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1. Introduction Chapter

1.1 Introduction

There are different perceptions to which one is exposed when examining literature about the history and origins of the Information Systems (IS) field. Hart (2006) stated that the IS field was established because advancements in computing technology meant that computers and processing of data became more integrated and useful as tools in business disciplines. Whilst some concur with this perspective, Hirschheim and Klein (2003) observe that the field has a lack of history as it discards its identity in line with technological advancement and new technological capabilities. This lack of history and change in identity has caused ongoing debate about the definition of the field as well as inconsistent perspectives as to what constitutes its central focus (Dahlbom, 1996; Hirschheim & Klein, 2003; King & Lyytinen, 2003; Gregor, 2006; Lyytinen & King, 2006; Klein & Hirschheim, 2008; Bryant & Land, 2012; Walsham, 2012).

The IS field suffers from a lack of identity, has fluid ideological boundaries, is amorphous, interdisciplinary and fundamentally misunderstood (Benbasat & Zmud, 2003; Hirschheim & Klein, 2012). These aspects lead to many parties within the field being perplexed about its nature. There has been an abundance of research conducted that identifies a "plethora" of intellectual territory (Beard, Schwieger & Surendran, 2007, p. 179) resulting in academia having a difficult time, or serious challenge (Chao & Shih, 2005), in keeping up with the rate of technological change (Lee, Koh, Yen & Tang, 2002) thereby creating a gap between graduate skills and industry needs (Janicki, Kline, Gowan, & Konopaske, 2004; Janicki, Lenox, Logan & Woratschek, 2008).

Whilst the literature identifying gaps between academic output and industry needs is well established (Gupta & Wachter, 1998; Hirschheim & Klein, 2003; Gill & Bhattacherjee, 2009; Bryant & Land, 2012), there is limited research into how students have or should overcome the challenge of moving out of academia into industry. This research is therefore concerned with the needs of IS students, how they develop in university and how they might overcome the identified gap between academia and industry; thereby becoming effective practitioners in industry. It argues that the instilling of existential characteristics, that inspire a climate of self-direction and inquiry, is essential in preparing learners for the messy, nonlinear, ill-defined nature of IS tasks (Kroeze, Lotriet, Mavetera, Pfaff, Postma, Sewchurran & Topi, 2011).

This chapter will give an overview of the research background and research problem, research purpose and questions as well as the research process that were used. Following this, the terms of reference will be listed and an overview of the structure of the thesis will be given.

1.2 Research Background and Problem

As discussed in the introduction to this research, there is a lack of agreement about the nature and boundaries of the IS field. These debates have been persistent since the field's inception (Klein & Hirschheim, 2008) and have resulted in the consensus that diversity is a defining characteristic of the field (Banville & Landry, 1989; Orlikowski & Baroudi, 1991; King & Lyytinen, 2003). This diversity is demonstrated by Topi, Valacich, Wright, Kaiser, Nunamaker, Sipior and de Vreede (2010) who highlighted that there are 21 names by which university IS departments identify themselves. In addition, curricula have become more generic (Topi et al., 2010) with encouragement from institutions to adapt curriculum and apply it to regionally relevant needs (Brewer, Harriger & Mendonca, 2006, p. 446). Lee (2005) and Ezer (2006) identified inconsistencies between curriculum globally, and Brown, Moola, Mugjenkar and Sands (2008) identified a need for different applications to cater for the different cultural priorities of students.

Though no correlation studies have been conducted, there are those who suggest that the field's enrolment crisis, identified by Hirschheim and Klein (2003), Granger, Dick, Jacobson and Van Slyke (2007), Saunders, Hunsinger and Colton (2008), Hunsinger, Land and Chen (2010) is caused by the diverse and inconsistent applications of curricula.

A direct contrast between this diversity and inconsistency in curriculum can be demonstrated by comparing the IS field to the established fields of accounting and medicine. Whilst the IS field is characterised by debates of its identity and focus, the accounting field is governed by accreditation and regulatory bodies (such as the South African Institute of Chartered Accountants – SAICA). GAAP (a world standard of Generally Accepted Accounting Principles) provides a basis for firms and practitioners to operate with and refer to. Best practices, are relatively firmly established and firms have their financial results captured, regulated and audited in a standard way and in accordance with strict legal regulation.

In addition, whilst the medical field produces standard graduates who graduate as 'general practitioners' and can choose to specialise later, Richards, Marrone and Vatanasakdakul (2011) identified as many as 84 relevant skills and roles relevant to the IS field, some of which are not covered by the differing approaches to curriculum. Goodfellow and Hewling (2005) highlighted that whilst medical graduates are bound by the Hippocratic Oath and strict ethical codes, the field of IS is ethically loose: copyright infringement, piracy, pornography and many other ethically dubious materials are freely distributed.

Taking note of this diversity and, the identified gap between academia and industry, one could argue that IS students are required to operate in a completely different psychological mindset to that of a medical or accounting student. That is to say, whilst accounting and medical students would seek to adhere to industry-wide best practices and ethical codes, IS students would be entering an industry characterised and defined by its diverse nature and eclectic perspectives of focus and identity. This leads to the assertion that IS students may have special needs and special research should be conducted into how best academia can prepare IS for industry.

1.3 Research Purpose, Objective and Questions

1.3.1 Purpose

As there is a multitude of perspectives in the IS field and a gap between academia and industry, the purpose of this research is to examine the experiences of Alumni and their journey from undergraduate students to practitioners in industry, and identify interventions that helped them in their development. In this endeavour, insight can be presented into how students have contended with the challenges of the field and how their experiences may help future graduates.

1.3.2 Objective

In conducting the literature survey, existentialism is presented as a possible characteristic that could be instilled in students to help them contend with the nature of the field. Through inductive analysis a theoretical framework of existential interventions is developed. The objective of this research is to assess how students developed and find any commonalty between experiences, propose trends and thereby test the existential theoretical framework induced from literature. Testing the theoretical framework would involve gaining insight, from students and Graduate Recruitment Officers, into how

best to instil the necessary skills to perform well in academia and then make a smooth transition to industry.

1.3.3 Research Questions

The research will be both descriptive and exploratory. In attempting to investigate, or describe, the development path of students, the following research question could be asked:

1. What do graduates recall as the factors, interventions, experiences and preparation that have contributed to their development?

In seeking to answer this research question, the researcher aims to gain reflective accounts on the development path of a sample of graduates and in so doing, analyse and potentially identify common trends. This is useful as "research to examine and understand how IS competencies and capability can be developed and sustained will provide a real source of value to organizations" (Peppard & Ward, 2004, p. 9). The researcher also aims to gain reflective accounts of Graduate Recruitment Officers and their perceptions and experiences of graduate adaptation to industry. For the purposes of this research, a Graduate Recruitment Officer could be defined as one who is responsible for hiring fresh graduates from academic institutions.

The research is also exploratory in that it seeks to explore the role of the academic environment in competence development and identify which factors and interventions practitioners recall as being most significant in their development. The following research question could be asked:

2. Is there a relationship between academic preparation and subsequent career trajectory?

As part of gathering reflective accounts from participants, the study will seek to explicitly initiate discussion about the role and effect the academic environment had on the development of practitioners. The perspectives of Graduate Recruitment Officers will also help in assessing readiness for industry.

In addition to exploring the role of the academic environment in competence development, the study will also investigate the role and effect of team work on competency development. A third research question could be asked:

3. Is there a relationship between group experiences and career trajectory?

As the field is characterised by a vast intellectual scope (March & Niederman, 2012), there are many roles and specialisations with an imbalance of priorities and focus on different factors. Cappel (2001) found teamwork to be the second most important attribute in IS competency. As a result of the vast intellectual scope and the inconsistency in application, it is possible that choosing a role or specialisation may be a naïve or uninformed decision. Whilst research has been conducted about the differing focus and prioritisation on a global (Lee, 2005; Ezer, 2006) and cultural level (Brown et al., 2008), the researcher feels the need to examine the effects of teamwork (or groupwork) on role and career choice, thereby assessing the peers' influence, on an individual's growth and career trajectory.

1.4 Research Process and Importance

The research will be conducted in a qualitative paradigm. According to Myers (1997), the origins of qualitative research can be traced back to social sciences. The intention was to enable researchers to study social and cultural phenomena. As this research is focused on the study of competency development of IS practitioners, a qualitative methodology was employed. A qualitative research methodology is one which involves the study of participants in their natural settings and helps researchers understand participants and the environment in which they operate (Myers, 1997; Kaplan & Maxwell, 2005). The use of open-ended interviews is common and is intended to draw out accounts of the interviewee's experiences and perspective. Data cannot be quantified as it is in the form of words rather than numbers (Kaplan & Maxwell, 2005). As a consequence of this, qualitative research typically involves interpretation of open ended interviews, questionnaires, documents, texts and accounts for the researcher's perspectives (Myers, 1997). There is a recognition that the researcher's "prejudice is a necessary starting point of our understanding" (Klein & Myers, 1999, p. 77). The research will therefore be conducted with an interpretive philosophy.

Orlikowski and Baroudi (1991, p. 13) describe an interpretive philosophy as one in which reality as well as knowledge are "social products and hence incapable of being understood independently of the social actors (including the researchers) that construct and make sense of reality." This means that any findings or knowledge is perspectival and that any theories of reality or truth are influenced by culture and conditioned by our point of view. Therefore subjectivity is acknowledged as our views of reality and reality can't be separated as if they exists independently (Raelin, 2007). Klein and Myers (1999, p. 67) argue that an interpretive research philosophy has the potential to "produce deep

insights into Information Systems phenomena." The researcher will therefore subjectively interpret accounts of graduates and Graduate Recruitment Officers in attempting to fulfil the research purpose. It is expected that this will provide insight into which interventions were most useful in competency development, thereby allowing for construction of a theoretical framework that could be generalised.

1.5 Research Context

Interpretive philosophy is described as a philosophy which values analysis of unique circumstances and is highly suspicious of any claim that studies of human behaviour can be culturally independent (Klein & Myers, 1999, p. 75). Interpretive IS research argues that relationships between people, organisations and technology are not fixed and socially constructed reality is a moving target. Therefore, each instance of interpretive research can be treated as a "unique historical occurrence" (Klein & Myers, 1999, p. 73).

In conducting this research and trying to understand the path of IS competency development, the role and effect of the academic environment and the role and effect of teamwork on that path, becomes troublesome with the presence of generic curriculum and the inconsistent and vastly differing application and prioritisation by different academic institutions. Therefore this research could be considered a unique historical occurrence as it is a case study limited to the accounts of and experiences of graduates from the University of Cape Town and Graduate Recruitment Officers. It examines graduates who completed third year and honours level IS courses at the University. Although this study encompasses five years of graduates; the data collection was conducted in 2012 and in 2014. Through this methodology, the researcher has sought to gain insight from practitioners with different levels of experiences and exposure to industry, as well as from those Graduate Recruitment Officers responsible for hiring them. Therefore the study is deemed to be cross-sectional as opposed to longitudinal.

1.6 List of Terms

This section explains some of the key concepts or terms used throughout the research. Deeper understanding and insight into the meaning or relevance of the concepts or terms will be given in the course of the thesis.

- Existentialism
    - "A philosophical attitude associated especially with Heidegger, Jaspers, Marcel and Sartre, and opposed to rationalism and empiricism, that stresses the individual's unique position as a self-determining agent responsible for the authenticity of his or her choices." (Dictionary.com, 2015)
- Competence
    - "The quality of being competent; adequacy; possession of required skill, knowledge, qualification, or capacity." (Dictionary.com, 2015)
- Practitioner
    - "A person engaged in the practice of a profession, occupation." (Dictionary.com, 2015)

1.7 Structure of the Thesis

The thesis is divided into nine chapters. This section gives an overview of each chapter. This will provide an abstraction of the most fundamental elements of each chapter.

Chapter One: The research is introduced and a brief overview of the research background, problem, process and context is given.

Chapter Two: As there is a lack of identity in the field, Chapter 2 is dedicated to developing a working definition for the field. The implications arising due to difficulties in identify formation around this working definition are discussed, as well as the implications of technological change.

Chapter Three: This chapter identifies the different voices in the identity crisis in the field. It presents the concerns of those who question the relevance of the field, those who call for a core focus, and those who argue that the field should embrace its diverse nature.

Chapter Four: The effect of the diverse nature of the field on academia is discussed. It is argued that there is a lack of agreement about what universities should do. This leads to there being inconsistent identities amongst academic entities and a gap between industry needs and academic outputs. Difficulties in development and application of curriculum are also discussed from global, regional and cultural perspectives.

Chapter Five: This chapter focuses on the effects the identity crisis and the challenges faced by academia, could have on students. It is will show that the identity crisis could potentially cause students to be hesitant to enrol and have difficulty in choosing a specialisation. In addition, it is argued that the lack of standards and guidelines result in learners being unable to rely on the credentials of a single academic institution.

Chapter Six: Existentialism is defined and presented as a possible characteristic that could be instilled in learners to help them move away from a credentialist mindset. Literature is presented and through inductive analysis a theoretical framework is created. The existential categories of Psychological Ownership, being in touch with Reality and Reflection, are argued to be crucial in building a sense of existentialism in students.

Chapter Seven: This chapter is the research design. It contains all the details pertaining to the research purpose, paradigm, target, sample space, time frame and strategy. In addition, the data-gathering process and research instruments are explained.

Chapter Eight: This chapter presents the results of the analysis of the data and findings for each of the research questions.

Chapter Nine: This chapter summarises the findings and presents the conclusions, claim for rigour and limitations of the research.

2. Establishing a Working Definition for Information Systems

As highlighted in the introduction to this research, there is ongoing debate about the definition of the field and inconsistent perspectives about what constitutes its central focus (Dahlbom, 1996; Hirschheim & Klein, 2003; King & Lyytinen, 2003; Gregor, 2006; Lyytinen & King, 2006; Klein & Hirschheim, 2008; Bryant & Land, 2012; Walsham, 2012). There is a need to dedicate this chapter to developing a working definition of the IS field. Section 2.1 is focused on examining existing literature to establish and present a working definition, section 2.2 is dedicated to examining the implications of technological change on the established working definition, whilst section 2.3 is focused on explaining how and why identity issues may emerge.

2.1 A Working Definition For IS

According to Shipman, Cunningham, Holst and Watson (2002) and Hart (2006), the IS field was established because advances in computing technology meant that computers and processing of data became more integrated and useful as tools in business disciplines. In the early stages, the study of IS involved the "recognition that the information that flowed into, out of and within an organisation was a resource that needed to be managed" (Tatnall & Burgess, 2009, p. 243). This meant that, in order to enhance business, computer scientists needed to understand business and business requirements, thereby creating the need for an intermediary profession which could act as a bridge between the technical temperament of computer science and the social temperament of business.

The establishment of this field involved a separation from computer science as it "concentrates upon the socio-technical aspects surrounding the implementation and use of ICT in organisations rather that the technical side of systems development" (Tatnall & Burgess, 2009, p. 241). This involves more of a focus on the social implications of computing and "keeping people and organisations in the picture at all times," which leads to focus on "what people do with the software and each other" (Kroeze et al., 2011, p. 384). Practitioners in the field could be thought of as mediators concerned with the intersection of "knowledge about machines" and "knowledge of human behaviour" (Gregor, 2006, p. 613). By focusing on people and their organisational needs, one could reason that Gregor's two elements are not mutually exclusive. Dahlbom (1996, p. 38) argues that "technology has become an expression of our interests, an implementation of our values, an extension of ourselves, a form of our lives." Latour (1999) concurs, arguing a crucial point that a reality is neither technologically determined nor socially constructed, but rather it is the result of interactions between human an non-

human actors. That is to say, when a human actor (a user, an organisation or society) and non-human actors (some form of Information Technology) interact, the result is neither technical nor social, but rather a product of the association of the two. To illustrate this point, Latour (1999) uses the analogy pressed forward by the National Rifle Association that fire arms themselves do not pose any danger to society, but rather the danger is in their inappropriate and misguided use. One could argue that the field is not concerned with technological systems and social systems in mutually exclusive context (Lee, 2001), but rather with the results and implications that manifest themselves when these two interact (Kroeze et al., 2011).

Further examination of literature reveals agreement on this point. Roode (1993, p. 62) referred to the IS field as "an interdisciplinary field of scholarly inquiry, where information, Information Systems and the integration thereof with the organisations are studied in order to benefit the total system (technology, people, organisations and society)". This definition leads to the perspective that IS involves using of technology to enhance some sort of social system. Peppard and Ward (2004, p. 184) concur that "technology in itself has no inherent value; this value must be unlocked, a task which can only be achieved by people." Part of this unlocking involves "exploration of technology by deploying it to deliver business benefits." This not only requires knowledge about technology but also "knowledge and skills from within organisational functions and processes." In and amongst all the definitions of the field, a common and persistent trend is that all definitions appear to be "concerned with the social processes surrounding the introduction, creation, use/misuse/disuse of information technology" (Orlikowski & Baroudi, 1991, p. 7).

Table 1 : Summary of Elements that define the IS Field

Paper	IT Artefact or Tool	Actions of Practitioner	Social Context or Need
Kroeze et al. (2011, p. 384)	"Software"	"Do with"	"People & organisations"
Gregor (2006, p. 613)	"Knowledge of Machines"	"Intersection"	"Knowledge of Human behaviour"
Latour (1999, p. 158)	"Non-human actors"	"Interaction with"	"Human actors"
Roode (1993, p. 62)	"Information system"	"Integration with"	"Total system"
Peppard and Ward (2004, p. 184)	"Technology"	"Exploration of"	"Business benefits"

Source: Sources listed in Table

Table 1 summarises the perspectives of the literature discussed. In examining these definitions and perceptions of the field and combining them, three elements are identified. It is clear that the field involves actions of people (practitioners – third column), trying to integrate or unlock, through ongoing design, evolution and evaluation (March & Niederman, 2012), the value of a tool, technology, software or a non-human actor (Information Technology (IT) Artefact – second column) thereby enhancing and catering for the needs of people and/or organisations (a social context – fourth column).

For the purposes of this research a working definition will be established. This working definition contains the three elements derived from the multiple perspectives of the field: the social context (the need), the IT Artefact (the tool), and the actions of an IS practitioner.

- The social context can be defined as an area or process, involving people or users, which requires (or needs) the use of technology for its facilitation, enhancement or automation. It is the "people, organisation or society" that Roode (1993, p. 62) referred to. Initially, most social contexts were business focused (Hart, 2006), however in recent times, this social context can differ vastly from situation to situation. Examples can range from trying to gain efficiency of manufacturing organisational operations, to tracing medical prescriptions, to electronic engine management systems for road cars, to distributing statistics of international sports events, to tracking inventory within farming communities. Roode (1993, p. 61) stresses the dangers of underestimating the importance of the social contexts, stating that this often leads to "inappropriate application designs, difficulty of use and outright failure of many systems." King and Lyytinen (2003, p. 147) concur, arguing that IT is always a "complementary asset in production and operation, and its value cannot be understood without the context of its application." Furthermore, it is argued that the "great strength of the IS field has been its ability to move beyond the IT artefact to the real story which is the context of IT application." (King & Lyytinen, 2003, p. 147).
- The IT Artefact, or tool - what Lee (2001) refers to as the technological system, can be defined as an Information System that captures processes and distributes information relevant to a social context. Benbasat and Zmud (2003, p. 186) describe the IT artefact as a "defining element" of Information Systems. It is "referred to as the application of IT to support task accomplishment, within a context" and can be conceptualised as "the application of IT to enable or support some task(s) embedded within the structure(s) that is itself embedded within a context(s)." Examples can range from point of sales software systems to electronic management systems in aeroplanes or motor cars.

- The IS practitioner can be seen as a facilitator in creating a symbiotic relationship between the technical tasks of creating and maintaining an IT artefact and the changing needs of the social context around it. The practitioner will have an awareness of "machines and human behaviour" (Gregor, 2006, p. 613) necessary to combine the technological system into a social setting and, in so doing unlock its value (Peppard & Ward, 2004) in order to satisfy human needs. As needs and tools change, this will involve the ongoing design, evolution and evaluation of the needs of the social context and the functionality of the IT artefact (March & Niederman, 2012).

This working definition of the field can be explained by using the graphical illustration in Figure 1. Consider part A of the diagram. When building an Information System, there exists some social context which could be enhanced by the implementation or use of an IT artefact. As can be seen, in part A in the diagram, the IT Artefact is required to cater for a subset of the needs of the social context around it. It can be said that, it is the IS practitioner's task, through evaluation of the social context, to design and to evolve the IT artefact so that it may grow (or be stretched) and cover the most important needs of the social context in a better way.

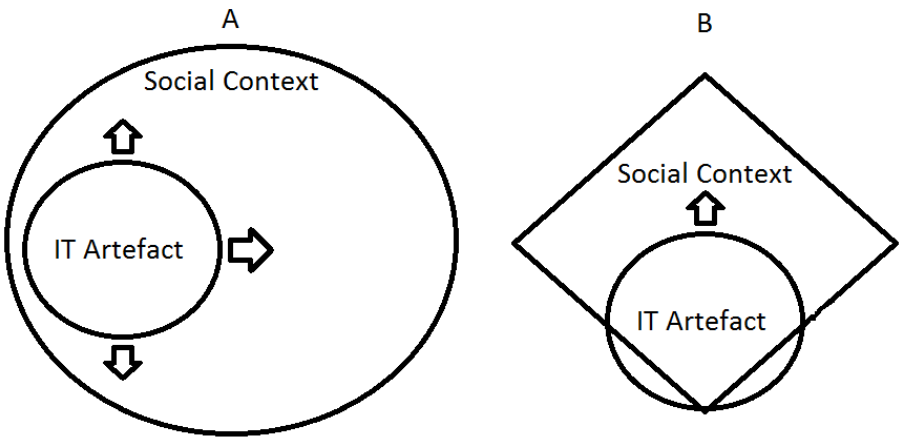

Figure 1 : IT Artefact and Social Context

Sources: Researcher's construct informed by March and Niederman (2012)

In addition to there being a vast range of differing potential social contexts, the landscape of a single social context may not necessarily be fixed and may be subject to constant change and flux. Consider the example of an established farming community who, noticing potential benefits of globalisation and outsourcing, wish to narrow their focus by selling their produce to a small number of exporters rather than selling it to stores and casual customers in a local market. The changes to the social context and additional (or reduced) requirements of such a decision (such as TAX, removal of point of sale functionality, reduced labour, import/export duties, consciousness of international demand) would

severely affect and transform the social contexts around the IT Artefact. In part B of Figure 1, where the landscape of the social context has changed, it is clear that a rigid IT artefact, one that does not change with, or for, the social context around it, will have limited effectiveness as its capabilities may fall outside the requirements of the needs of its social context. One could argue that it is the IS practitioner's responsibility to reshape, facilitate an evolution, or to re-align the IT Artefact with its new, or evolving, social context. One could conclude that: it is a field in which practitioners are required to assess IT Artefacts, assess social contexts and assess how IT Artefacts can be utilised to enhance the needs of the social contexts.

2.2 The Implications of Technological Change on this Working Definition

It has been established, by the construction of a working definition in Section 2.1, that the field is characterised by a social contexts (or need) that a practitioner must advance by using and changing an IT Artefact (tool). As argued previously, the practitioner can face an array of differing and changing social contexts mandating the need to create and recreate solutions to cater for the needs of a social context. It is also important to note that the presence of technological advancement and change results in there being a vast array of IT Artefacts (or tools) available to practitioners. Schön (1983) found that practitioners applying theory to practice face increased difficulty as a result of technological change. Perelman (1993) expressed a similar sentiment highlighting that the current rate of knowledge growth results in skills or expertise having short life spans. This puts pressure on people to act both as learners and teachers. Peppard and Ward (2004, p. 169) encouraged companies to have scepticism whilst seeking to gain competitive advantage through IT, showing that gains were "short lived and not enduring." Any "knowledge about machines" would have a limited "shelf life," placing a challenge on the IS practitioner.

The influence of changing technology (or the capabilities of the hardware technology and IT Artefact) on the field as a whole can be seen by looking at the history of naming in the field. Dahlbom (1996) notes four eras in the IS field:

1. **Data processing** – involved the automation of transaction processing primarily for military purposes.
2. **Management Information Systems** – the use of computers by companies and government agencies to control administrative systems.

3. **Personal Computing** – involved end-user productivity to promote individual effort away from administrative centres by focusing on user interface design.
4. **LAN and Internet** – an era where media, communication and connectivity were pressed forward.

Dahlbom (1996, p. 30) notes the constant "utter surprise which has marked each of these transitions" demonstrating the fluid nature of the field. Hirschheim and Klein (2003) suggested a fifth era, that of the "e-Village," where online services become more ubiquitous. In addition, it was argued that there was a deeper impact of technological change on the field itself by stating that each of the above eras represents a "discarding of an identity in search of another. The identity changes not so much related to generations of hardware capabilities as to usage patterns associated with new technologies (p. 247)." The tools and standards used to build the IT artefact are enhanced and this causes "even finer divisions of labour and with this comes more and more rapid social differentiation contributing to the communication gaps" (p. 248) within the field. In addition, whilst the working definition calls for changing of an IT Artefact for the needs of a social context, perhaps the historical trends identified prove the capability of an IT Artefact to influence social contexts, with increased capabilities creating new social uses.

2.3 The Implications on Identity Formation

As argued in previous sections, the IS field is one in which there exists many changing social contexts and many differing IT Artefacts (or tools) that are changed by technological advancement. It could be argued that the practitioners in the field suffer from the twin perplexities of having to enhance a vast range of possible social contexts that are subject to change, with vast and changing IT Artefacts or tools. Figure 2 is a graphical representation, derived from Table 1, of the twin perplexities facing the practitioner and the difficulty in choosing and changing an IT Artefact to cater for a social context.

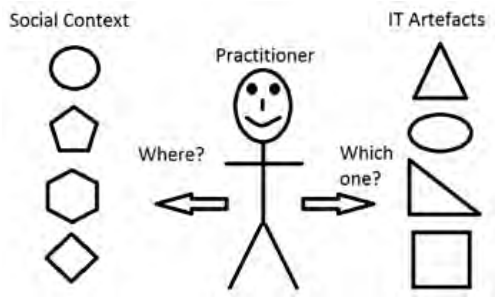

Figure 2 : The Twin Perplexities facing Information Systems practitioners

Source: Researcher's own construct informed by Roode(1993), Dahlbom (1996), Latour(1999), Benbasat and Zmud (2003), Hirscheim and Klein (2003), Peppard and Ward(2004), Gregor(2006), Kroeze et al. (2011)

As practitioners work in differing social contexts, represented by the differing shapes under 'Social Context' in Figure 2, with differing IT Artefacts, represented by the differing shapes under 'IT Artefacts' in Figure 2, that do not fit with each other, an observer viewing the field as a whole may be perplexed by its purpose or focus. The presence of this diversity and change has led to a common and persistent view point declaring that IS is a reference discipline, it can be described as "amorphous" and "interdisciplinary" (Benbasat & Zmud, 2003). This means that the field borrows from, contributes to (Lee, 2001; Hassan & Will, 2006) and competes with (Bernroider, Pilkington & Córdoba, 2013), the disciplines or social contexts that it seeks to enhance and "contrary to the opinions of many Information Systems managers and practitioners alike, Information Systems is not a purpose unto itself" (Roode, 1993, p. 63).

In evolving the Information Technology (IT) Artefact or in dealing with differing users, differing user needs, differing and constantly changing social contexts the phenomenon surrounding the interaction of people and any IT Artefact involve factors, such as psychology, sociology, cognition, computer science, strategy, marketing, accounting, operations and other disciples related to the design, development, management, evolution and use of Information and Communication Technologies (ICTs) to accomplish human goals (Roode, 1993, p. 63; March & Niederman, 2012; Bernroider et al., 2013). These multiple social contexts, that are subject to change, and the advances in technology have caused some to postulate that IS can no longer claim that the subject matter of ICTs in organisations and society is unique to itself (Walsham, 2012). One could consider the field as "holistically minded," as it would employ "mixed methodologies to consider technology, information, people, communities, organisations, environments, history and more" (Kroeze et al., 2011, p. 384).

Naturally, with so many intellectual and interdisciplinary factors (March & Niederman, 2012) and priorities at play, the focus and boundaries of each being applied differently in different circumstances, lead to a difficulty in strictly defining an identity for the field. This leads to many accepting and concluding that the field has "fluid" boundaries (Hirschheim & Klein, 2012). The result of this fluidity is that many questions are raised about the focus and core of the field and participants engaging in debates about identity and legitimacy. Banville and Landry (1989) best describe the field as a 'fragmented adhocracy.' That is to say it consists of scattered fragments with differing viewpoints and ideologies all culminating in a flexible, adaptable, and informal structure without bureaucratic policies. These debates about the focus and core of the field are an established and persistent

characteristic of the field. The multitude of potentially relevant priorities means that different applications are appropriate and in different social contexts and in order to work in the IS field, one does not need a strong consensus with one's colleagues as long as there is some external body of support (Banville & Landry, 1989).

2.4 Summary

The chapter began by presenting a history of the origins of the field and its separation from Computer Science. In reviewing literature, many different definitions of the field were found and a need to construct a working definition was established. This working definition contained three elements, presented in section 2.1, and can be described as:

> A field in which practitioners are required to assess IT Artefacts, assess social contexts, and assess how IT Artefacts can be utilised to enhance the needs of the social contexts.

After establishing this definition, section 2.2 then presented the impacts of technological change. The elements in the definition were argued to be unstable, as the many eras of technological advancements often caused unexpected new capabilities. This causes the IS practitioners to suffer from the twin perplexities of differing, changing IT Artefacts and differing, changing social contexts. The establishment of these twin perplexities lead the discussion into section 2.3 where it was argued that the diverse, ever advancing and changing nature of the field has caused many from within the field, to be perplexed by its true nature and describe it as amorphous, fluid and to deem it necessary to question its core focus and identity. Chapter 3 will focus on presenting the differing views and voices about identity and ideological boundaries, from within the field.

3. Voices within the Identity Crisis

As argued in the previous section, the IS practitioner deals with the twin perplexities of having to keep up with the rapid rate of technological progress and the diverse nature of a multitude of changing social contexts. In dealing with these twin perplexities it was argued that many intellectual factors come into play. The differing application and approaches by different practitioners in differing circumstances have caused perception and identity issues for the field, leading it to have fluid ideological boundaries (Hirschheim & Klein, 2012) that are "far from distinct" (Tatnall & Burgess, 2009, p. 238). Some consider it a "fragmented adhocracy" (Banville & Landry, 1989); which is an industry comprised of a collective of eclectic communities all contributing to and participating in constant debates of identity, legitimacy and focus (Walsham, 2012) with differing views on what constitutes the core of the field. These debates can be traced back to at least the first International Conference in Information Systems (ICIS) in 1980 (Klein & Hirschheim, 2008).

Although opinions on the presence of diverse approaches are divided, the presence of those diverse approaches is widely accepted as being a defining characteristic of the field (Banville & Landry, 1989; Orlikowski & Baroudi, 1991; King & Lyytinen, 2003). Among the diverse approaches and ideologies, there are three loose areas or schools of thought on the identity of the field. These three schools of thought were identified by Hirschheim and Klein (2003) and investigated by the researcher in reading material containing debates about the field. The first is a question of relevance and need for existence, the second calling for the establishment of a core identity, and the third calling for the field to embrace its diversity.

Those who question the field's relevance and existence, argue that different entities working on diverse topics without much communication lead to a duplication of effort. In addition, advances in technology and the ubiquity of IT applications may make IS research redundant (Carr, 2003). The second call is the recognition of disillusionment within the field and a need to contend with the perceptions of being considered a reference discipline (or contributing discipline as argued in Chapter 2), rather than a discipline in its own right (Baskerville & Myers, 2002). In response to this disillusionment and fear of illegitimacy, the establishment of a core focus and establishment of regulatory bodies are proposed. The third call is one for recognition that IS has grown and has been embraced by many other parties or disciplines that it seeks to enhance, and can therefore no longer claim that the subject matter of Information Technology in organisations is unique to itself (Walsham,

2012) as it covers a vast intellectual scope and caters for vastly differing areas of interest, thereby acknowledging the necessity to embrace diversity and allowing for unregulated freedom and innovation. Each of the schools of thought is discussed in the sections that follow.

3.1 Questioning Relevance and/or Existence

The first school of thought that questions the relevance an existence of the field is characterised by an apocalyptic tone. King (2011, p. 134) argues that the field must no longer assume it will exist, but rather that it will become necessary to make a choice of "how best to live dangerously." As it has been established as a contributing or reference discipline (Roode, 1993), there are some who feel it should be absorbed by other fields. There is evidence that the identity crisis in the field and a lack of understanding of its nature have caused enrolments in IS courses to decline (Choudhury, Lopes & Arthur, 2010) and the relevance of IS courses to be brought into question (Davidson, 2011). Tatnall and Burgess (2009) highlighted that some IS-related subjects were combined with other subjects such as marketing and e-business. Gill and Bhattacherjee (2009, p. 223) argue that IS faculties suffer from reduced recruitment and that many Masters of Business Administration (MBA) institutions do not include IS as a core subject. Carr (2003) went as far as to predict state that since the use of IT will become more ubiquitous, IT will be perceived as a commodity, in no way yielding competitive advantage, in no way allowing for any creative application and no longer at, or near, the centre of business strategy.

Hirschheim and Klein (2003, p. 252) highlight a paradox stating that although IS projects have the power to be at the centre of business strategy, they are often viewed as "overheads, that is a cost of doing business that must be minimised." These negative connotations lead to senior management to think "IS function's successes are perceived as 'business unit successes' yet IS failures are labelled 'IS failures.'" Peppard and Ward (2004, p. 176) concur, stating that although the IS function is traditionally seen as an isolated entity, which can lead to organisations outsourcing IS functions, the actions of the IS function need to be "integrated and coordinated" with the internal activities of an organisation. King and Lyytinen (2003) criticise the persistent moody tone, apocalyptic sentiments and blindness to success present in the field and argue that it amounts to scientific narcissism and whining. Bryant and Land (2012) also expressed concern that such questions from within the discipline itself are activities not appropriate for a mature and established discipline. Whilst some feel these questions of legitimacy are irrelevant and immature, others such as Galliers (2003, p. 345) argue that "any field that is able critically to reflect on itself and range widely over related subject matter actually enhances its

legitimacy." Benbasat and Zmud (2003) also describe these debates as necessary periodic "soul-searching."

3.2 Calling for a Core

It was argued that the twin perplexities established in Chapter 2, result in the IS field having many possible intellectual factors to prioritise (March & Niederman, 2012). With the field covering so much intellectual territory, debates exist about which factors should be included in the core of the IS field. The fluidity and evolving nature of the field are conditioned in many respects by exogenous factors such as changing technology, political complexities of organisations and institutional environments, as Roode (1993) identified the IS field is not a purpose onto itself. In addition, its youth means it lacks "the cumulative theory development found in other engineering and social-science disciplines" (Hevner, March, Park & Ram, 2004, p. 99).

In identifying an internal focus for the field, some feel there is danger in "focusing attention solely on IT-based systems at the expense of a consideration of the essentially human activity of data interpretation and communication, and knowledge sharing and creation" (Galliers, 2003, p. 340). This is concerning in light of Dahlbom's (1996) finding of the utter surprise by which new uses of IT were created with changing hardware capabilities. Benbasat and Zmud (2003) demonstrate this conflict of focus by highlighting the fact that in the years 2001 and 2002 one third of IS research was not related to an IT Artefact. They argue there is presence of under investigating phenomena intimately associated with IT Artefacts (the technology or "knowledge about machines") and over investigating phenomena distantly associated with the IT Artefacts. This is considered a concern as producing such research makes the central identity boundaries of IS scholarship ambiguous, thereby raising questions regarding the distinctiveness and legitimacy of the field.

This is a persistent concern ingrained into the IS field as DeLone and McLean (1992, p. 80) made a similar argument, or prophecy, that without clearly defined outcome measures the IS field could have multiple measures of success and become very speculative with no clearly defined success criteria and thereby have to face the questions of legitimacy still being raised today (Hirschheim & Klein, 2012; March & Niederman, 2012; Walsham, 2012). In referencing other disciplines and borrowing theories, the IS field has been distracted from developing its own theories, or "jurisdiction" (Bernroider, 2013), and the debates of identity and legitimacy appear to have no sign of abating (King & Lyytinen, 2006;

Lyytinen & King, 2006; Weber, 2006; Klein & Hirschheim, 2008). To achieve some form of consistent identity, there is a call for coherent and sustained focus on the IT Artefact without which no pure success or independent achievements can be claimed. Land (posting to ISWorld 26 March 2004) goes as far as to say that the IS academic community has not in itself created or initiated new uses of IS, but rather 'scrambled aboard the latest bandwagon' and engaged in 'hype' rather than being sufficiently critical. Examples can be found in Facebook and Google which are the subject of IS research but were created by individuals removed from the field. This sentiment is echoed by Myers, Baskerville, Gill, and Ramiller (2011, p. 367) who claim that "researchers sometimes chase after whatever is current and, frequently, a craze in industry, without doing much service for durable scholarly knowledge."

Hirschheim and Klein (2012) re-emphasised this point by raising concern that the rapid growth of the field into a collective of sub communities working on their own specialised topics, has resulted in the early thinkers being forgotten and thereby creating a lack of focus on developing a history for the field. This stands in contrast to the established field of medicine where a shared sense of identity exists and achievements, such as the first heart transplant, are celebrated and highlighted as milestones. Hirschheim and Klein (2012) consider this a serious shortcoming of the field and state that not having a shared sense of history and shared achievements limits the ability of the field to move forward. Though this is a strong sentiment, as presented earlier in section 2.3, the ever evolving and advancing use of technology has caused the field to frequently discard its identity in search of a new one in the presence of changes in hardware capabilities (Hirschheim & Klein, 2003). Another contrast to the medical field can be found when ethical considerations are taken into account. The increasing emergence of web-based services is in many ways a cause for concern. Goodfellow and Hewling (2005) argue that the casual approach to the law taken by most Internet users has allowed for the Internet to be similar to the Wild West rather than any property regulated environment. Copyright infringement, piracy, pornography and much other ethically dubious material are freely distributed. Bryant and Land (2012) argue that a case could be made for practitioners to develop and subscribe to codes of conduct or equivalent to the Hippocratic Oath enforced in medicine. A 'core' would constitute a central focus or direction for the field in which clear ethical and ideological boundaries can be established and unruly user behaviour could be catered for.

In attempting to build a core for the IS field, the constituents are calling not only for a sustained and coherent identity for the field, but also a shared history. One could argue that the call for a core is one

in which the constituents, be they academic, companies in industry or individual practitioners, in the fragmented adhocracy could abandon their fragmented ideologies and rather come together, remove duplication and agree on a finer definition of the field, thus creating an identity, sustained focus and shared history and priorities.

3.3 A Call to Embrace Diversity

As argued in section 3.2, many argue that the identity crisis and lack of understanding about the focus of the IS field could be solved by the establishment of a core and coherent identity. Others feel that the very nature of the IS field, which involves on going design, evolution and evaluation (March & Niederman, 2012) mandates diversity, and that the diverse nature of the field is in fact a blessing (Robey, 1996).

Robey (2003, p. 353) argues that: "having an established identity does not necessarily imply stability." One could argue that a "stable identity might even become a liability that limits a professional field's ability to change in response to environmental changes." Such a core should not compromise flexibility and adaptability, but rather allow for the continuous environmental changes that characterise the field. King and Lyytinen (2003, p. 143) argue that the "field needs a bold intellectual reach rather than a tight disciplinary grasp." As established earlier in section 2.3, the presence of technological change has resulted in the field discarding its identity and searching for a new one on multiple occasions, thereby making revising its identity an ongoing practice. Dahlbom (1996, p. 30) stated that the field must "perhaps accept a confusing variety of partly overlapping approaches, constantly changing and constantly changing names." As Robey (2003, p. 354) states: "We have revised our identity in the past and we will need future revisions." Galliers (2003, p. 340) concurred, questioning the need for a core that would continually need to be changed and raising concern that any core would become a "battle field rather a field of dreams."

King and Lyytinen (2003), argue that searching for a core identity is dysfunctional and betrays the field's initial mission. Furthermore, they argue a lack of evidence exists to support the existence of a core leading to disciplinary success, or lack of a core leading to disciplinary failure. Dominant methodological paradigms might serve to compromise the disciplines the field seeks to enhance. Galliers (2003) concurs, arguing that the transdisciplinary nature of IS makes strong disciplinary boundaries inappropriate and calls for embracing of interdisciplinary participation. Bryant (2008)

made a similar argument that a single, clear objective was not appropriate, but instead, a process of continual explanation, explication and dialogue was necessary.

King and Lyytinen (2006, p. 39) argue that to dangerously narrow a field whose intellectual scope covers so much territory and is changing so fast, would limit the field's effectiveness. It is not possible to solve or enhance a range of differing problems with a single solution methodology. Walsham (2012) went as far as to argue that having such a core with strict regulation and boundaries would serve as a "straightjacket" affecting the ability of the field to truly exist in an interdisciplinary way.

One could argue that the beauty of such a field is that a lack of identity could be advantageous as it would serve to break down the "notion of institutional elitism" that many consider offensive (Robey, 2003, p. 403). In doing so, the diversity would "eliminate the distorting effects of hierarchy and other forms of power, to introduce channels for cross-checking data and claims, introduce checks and balances against subconscious bias and self-deception, and to reduce defensiveness and other psychological barriers to free inquiry" (Hirschheim, Klein & Lyytinen, 1996, p. 42).

3.4 Summary

In the introduction to this chapter it was argued that the twin perplexities IS practitioners need to contend with, lead to a vast number of relevant intellectual factors causing the field to be characterised by diversity (Banville & Landry, 1989; Orlikowski & Baroudi, 1991; King & Lyytinen, 2003). This has resulted in the development of the field as a 'fragmented adhocracy' (Banville & Landry, 1989) which has a lack of identity, fluid ideological boundaries and lack of coherent focus. Figure 3 is a graphical illustration (adapted from the factors March and Niederman (2012) consider to be relevant to the field) demonstrating the views from within the field.

Part A of the diagram represents the views expressed in Section 3.1. Those who question the existence and relevance of the field argue that the many disciplines, or intellectual areas, as identified by March and Niederman (2012), could absorb the IS function into their disciplines rendering the field redundant. This will result in disciplines practicing IS by themselves in a fragmented way. Part B of the diagram represents section 3.2. There was a concern that the establishment of a core that would capture all the relevant intellectual factors for the discipline (based around the IT Artefact) may be

necessary for its survival. The IS field would seek to draw elements from other disciplines into its core thereby having clearly defined factors contained. Whilst this would promote identity, other disciplines would need to adapt to the best practices established within the core of the IS field. Part C of the diagram represents the views expressed in section 3.3. Rather than forming a dominant containing core, it was argued that any core would be limiting and negatively affect freedom and ability to reach out to other disciplines. Bidirectional collaboration could result in the IS field making innovative and valuable partnerships and contributions to other disciplines.

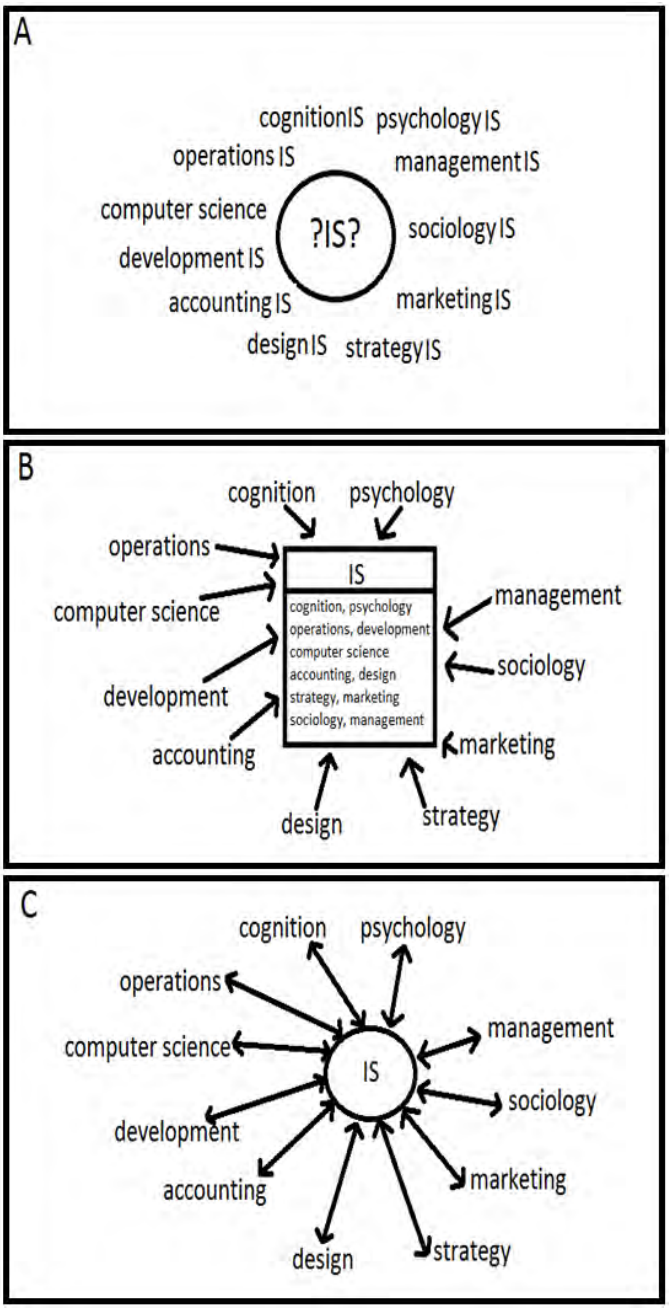

Figure 3 : Illustration of perspectives in the field

Source: Researcher's construct - Informed by March and Niederman (2012)

In the presence of this diversity, it is clear that the field lacks the presence of some form of formal regulator or accreditor who would take responsibility for defining identity, best practices and ideological boundaries. To make matters more complex, there is an indication of a distance of industry from the academic environment. Bryant and Land (2012) show that whilst medical practitioners and accountants have must-read journals and research outlets, very few CIOs (Chief Information Officers) look at IS journals and if they did, they may become perplexed by the content within them. This distance is a persistent characteristic of the field, as Avison and Fitzgerald (1991) noted a continual, although healthy, tension between theory and practice, not only in Information Systems but also in the whole of business studies. As this research is concerned with the competency development of IS students within the academic environment, the following section seeks to demonstrate the effects of the diverse nature of the IS field and its lack of identity on the academic institutions.

4. Effect of the Nature of Information Systems on Academia

In this chapter the effects of the nature of IS, a lack of clear identity, and the presence of these debates of ideological boundaries and legitimacy on academic institutions, will be discussed. Section 4.1 discusses the role of the academic world and identifies its distance and shortcomings in catering to the needs of industry. Section 4.2 then argues that the identity crisis has spilled over onto academia with differing approaches evident. Section 4.3 discusses the difficulty in creating and applying globally relevant curriculum, and section 4.4 summarises the chapter.

4.1 The Role of the Academic World and its Relation to Industry

In considering the role of the academic world it is important note: the historic primary purpose of universities was the establishment of a library so that scholars could gather and meet around it; engage with the material within and thereby gain and exchange knowledge (Dreyfus, 1999). This exchange could be in the form of students attending class and being taught by professors or the production of academic research (Dreyfus, 1999). Although universities enjoy continuous enrolment and prestige, their purpose and role in society are debated.

While there are many research-led universities, it is reasonable to expect that students expect "their degrees to qualify them for a career in the discipline" (Brewer et al., 2006, p. 446). If one holds the view that academic institutions exist to prepare students for industry by teaching theory and guidelines, a difficult challenge is placed on academic institutions and learners, not only in needing to be agile in keeping up with current technological trends and industry needs (Janicki et al., 2004), but in deciding which technological trends and industry needs to keep up with. Educators need to therefore constantly correct and adapt to changing needs of the employers in industry (Janicki et al., 2004). Lee et al. (2002, p. 51) argue that:

> Change in IS technology is so fast and dynamic that even the IS industry has and continues to have a hard time catching up. Under this dynamic environment, IS academics have had a hard time to cope with the change and to satisfy the demands of the IS industry.

The diverse nature in the IS job market, that causes a "plethora" of curricula topics (Beard et al., 2007, p. 179), combined with the continuous and persistent rapid advances in technology, leave the educators and recruiters of IT and IS practitioners with a serious challenge (Chao & Shih, 2005). One could conclude that the twin perplexities of the IS practitioner are also the twin perplexities of the

academic institutions that seek to prepare new practitioners for industry. Consider Figure 4, which is an enhancement of Figure 2 presented in section 2.3. In preparing guidelines, which would be the foundation on which a future practitioner would stand, the university is affected by the same twin perplexities of multiple changing social contexts with multiple changing technological tools.

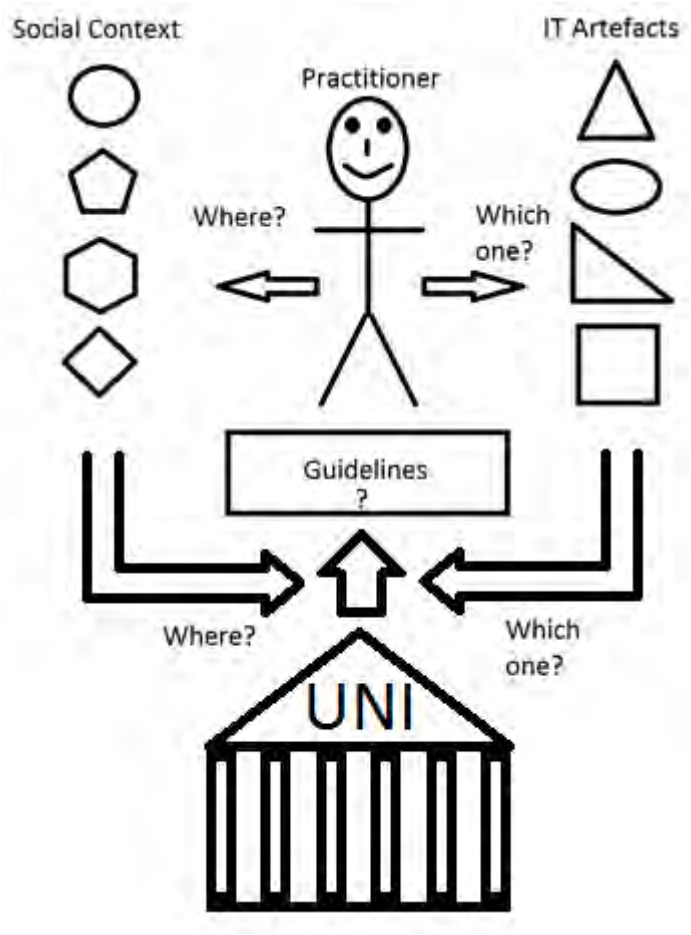

Figure 4 : The twin perplexities faced by the universities

Source: Researcher's construct informed by March and Niedermann (2012)

In order to contend with the rapidly changing needs, there are those who believe that academic research should not be conducted in isolation but rather that links to industry are essential in meeting real-world demands. Some feel that joint ventures, between academia and industry are critical in facilitating some form of cohesion between theory and practice (Land, Loebbecke, Angehrn, Clemons, Hevner & Mueller, 2009). Myers et al. (2011, p. 358) argue that only through "direct engagement" rather than through publication will researchers be able to influence practice. Gill and Bhattacherjee (2009, p. 229) highlight that "sabbaticals in practice" are common in other disciplines such as law, economics and science and these help gain experience and awareness. Such links will allow "cross

pollination" of "academics MIS (Management Information Systems) research with ideas emanating from practice or other disciplines, which can only enrich future MIS research" (Gill & Bhattacherjee, 2009, p. 231).

Despite this expressed need for joint ventures, authors such as Hevner et al. (2004, p. 99), identify a disconnection between academic research and its use in industry. Gupta and Wachter (1998, p. 428) argue a persistent "gap between what industry wants characteristically in IS personnel and what academia provides them." Gill and Bhattacherjee (2009, p. 218) identified lack of "practitioner contributions" in IS journals. Hirschheim and Klein (2003, p. 253) argue:

> A significant disconnect between IS practitioners and IS academics is well known. IS practitioners feel academics live in ivory towers engaging in research that is devoid of any practical relevance. IS academics on the other hand, feel that practitioners do not understand the need for theory and are only interested in vocational training.

The universities could face the questions of: which tools should we use and which social context should we apply them to? What guidelines follow, enhance or create? One could argue that current guidelines are inadequate as there is evidence of a mismatch between graduate skills and industry needs (Braun, Tesch & Colton, 2005; Seymour, Scott, Malamoglou, Meyerowitz & Morar, 2006). Explanations of this mismatch are divided:

- Richards et al. (2011, p. 1) argue that "the field must find a balance between teaching the fundamentals which are stable and core and changing course content and delivery to meet the current and future needs for knowledge and skills in the industry."
- Lee et al. (2002, p. 60) argue that "lack of resources for computing upgrades, an unacceptable speed of curriculum change relative to speed of technology change, and/or lack of faculty knowledge/training about new technology" are major reasons for this mismatch.

Crawford, Morris, Thomas and Winter (2006) found that exposure to a real-world project environment, rather than overly theoretical approaches, is a vital learning experience for IS graduates. Whilst projects may be useful, the dual pressures of rapid technological changes and preparing the student for a myriad of possible diverse, ever changing and unstable social contexts, require a learner to have the ability to transfer their skills to different settings (Lee, 2005).

In essence, the literature is highlighting concern about the activity of the academic side of the field and its effectiveness in creating practitioners ready for industry. The distance between industry and the academic environment is regarded as problematic, as there is a mismatch of industry expectations and academic activities leading to more differentiation and fragmentation thereby amplifying the identity issues discussed in Chapter 3.

4.2 Effect of a Lack of Identity on the Academic Institutions

As discussed, the field of IS lacks a core identity or focus and is characterised by many constituent parts with conflicting fluid ideologies and visions of ideological boundaries for the field. This lack of a core identity is demonstrated and compounded by the vast array of names with which IS departments identify themselves. Topi et al. (2010) identified the following examples listed in Table 2.

Table 2 : Differing Information Systems Department Names.

Name	Percentage
Management Information Systems	41%
Information Systems	21%
Computer Information Systems	18%
Information Management, Information Systems Management, [Business] Information Systems, [Business] Computer Systems, [Business] Computer Information Systems, [Business] Information Technology Management, [Business] Informatics, Information Resource Management, Information Technology, Information Technology Systems, Information Technology Resource Management, Accounting Information Systems, Information Science, Information and Quantitative Science	Remaining 21%

Source: Topi et al. (2010)

The identity crisis in academia (as made obvious by varying names and interpretations of what constitutes IS), leads to difficulty for academic departments to draw comparisons with each other thereby causing universities to question the need for IS departments and Deans holding the 'disturbing belief' that the field is losing relevance (Hirschheim & Klein, 2003). Khazanchi and Munkvold (2000, p. 25) found that the lack of a core identity for IS has caused universities to believe that the field is being integrated into other fields and therefore is unable to build pure knowledge or social capital and have started questioning the need for IS departments.

Possible reasons for this decline were related to perceptions that programs were too technical and that outsourcing and globalisation reduced the demand for IS related jobs (Hirschheim & Klein, 2003). Pitt (2008) found the latter perception to be false and that although the demand is increasing, fewer college students are pursuing computer-related degrees. This mismatch between demand and supply is perplexing, March and Niederman (2012) suggest that the identity crisis, the lack of standardisation and uncertainty about the future or nature of the field can lead to students being hesitant to enrol. Whilst correlation between identity issues and enrolment has not been proven, there is clear evidence of enrolment crisis as Granger et al. (2007, p. 305) identified that since 2001, enrolments have decreased as much as 70% or more throughout the world. Possible reasons suggested are that a perception that the field has no jobs, that there will no longer be jobs by the time students graduate, that the jobs are going offshore, that salaries are low and that the degrees themselves are not valuable. Hirschheim and Klein (2003), Saunders et al. (2008) and Hunsinger et al. (2010) found a 50% drop in student enrolments between 2000 and 2005 and the student numbers have yet to increase.

In addition to contending with diverse perspectives, Topi et al. (2010) found that outdated curriculum could turn prospective students away from the discipline. At the heart of the challenge of teaching in the presence of the twin perplexities, is the need for IS curricula to be constantly re-evaluated (Tatnall & Burgess, 2009). This need for re-evaluation is regarded as a major challenge in developing an "effective IT curriculum" (Brewer et al., 2006, p. 452). The implications of this need on the application and development of curriculum cannot be ignored. Now that the effect of the identity crisis on the academic side of the field has been established, the effect and consequences of the nature of IS on curricula will be discussed in the section that follows.

4.3 Difficulties in Curriculum Development and Application

The effect of the identity crisis on academia is demonstrated by the vast number of names that IS departments identify themselves with, leaving universities with difficulty in comparing departments and questioning the relevance of the departments (Khazanchi & Munkvold, 2000). This identity crisis is also suggested as a possible cause for the enrolment crisis in the field as potential students may feel perplexed and hesitant to enrol. The effect of the identity crisis on curriculum development and application is highlighted in this section.

The accounting field provides a good contrast to IS in terms of curriculum development and delivery. As argued, the IS field is in a constant battle against eclectic perceptions and constructing and identity. In clear contrast to this, the accounting field which is firmly established and is governed by SAICA and GAAP, provides a basis for firms and practitioners to operate with and refer to. Best practices are relatively firmly established, and firms have their financial results captured and audited in a standard way and in accordance with strict legal regulation. Gupta and Wachter (1998, p. 430) found that the dynamic and complex environment of the IS field means that "no single IS curriculum can possibly achieve all of industry's requirements." A "one-size-fits-all" or a "one-size-fits-most" approach is not appropriate.

As argued earlier, there is a need for IS curricula to be constantly re-evaluated (Tatnall & Burgess, 2009). The IS field does not have the luxury of authoritarian bodies or figures, but rather contains an eclectic collective of associations and journals which provide guidelines on curriculum development and application. The Association for Computing Machinery (ACM) and the Association for Information Systems (AIS) are examples of such associations. As highlighted in the working definition, Dahlbom (1996) identified 4 eras in the history of the field in which hardware capabilities evolved and the field therefore changed focus. Hirschheim and Klein (2003, p. 247) identified each of the phases as a "discarding of an identity in search of another." If one were to hold the view that curricula should be adaptive and responsive to changes in industry needs and technological capabilities, one could argue that the fact that only three revisions to IS curriculum have been produced in the last two decades, is inadequate. The first significant curriculum developed by ACM and AIS was IS'97 (Topi et al., 2010). IS2002 was also developed by AIS and ACM and only contained minor updates to IS'97, and is the most common basis for accreditation of undergraduate programs over the past decade (Topi et al., 2010). Figure 5 shows the focus of the IS2002 curriculum. It represents the areas of interest highlighted in IS2002 for an IS practitioner.

Gargone, Davis, Valacich, Topi, Feinstein and Longenecker (2002) classify four major areas of focus: knowledge of technology, a view of business from a real-world perspective, strong analytical and critical thinking skills, and strong interpersonal communication and team skills. IS2002 called for the critical and analytical assessment of a business situation adhering to business fundamental rules and using interpersonal and communication skills to motivate a team to utilise technology to enhance processes or achieve business objectives.

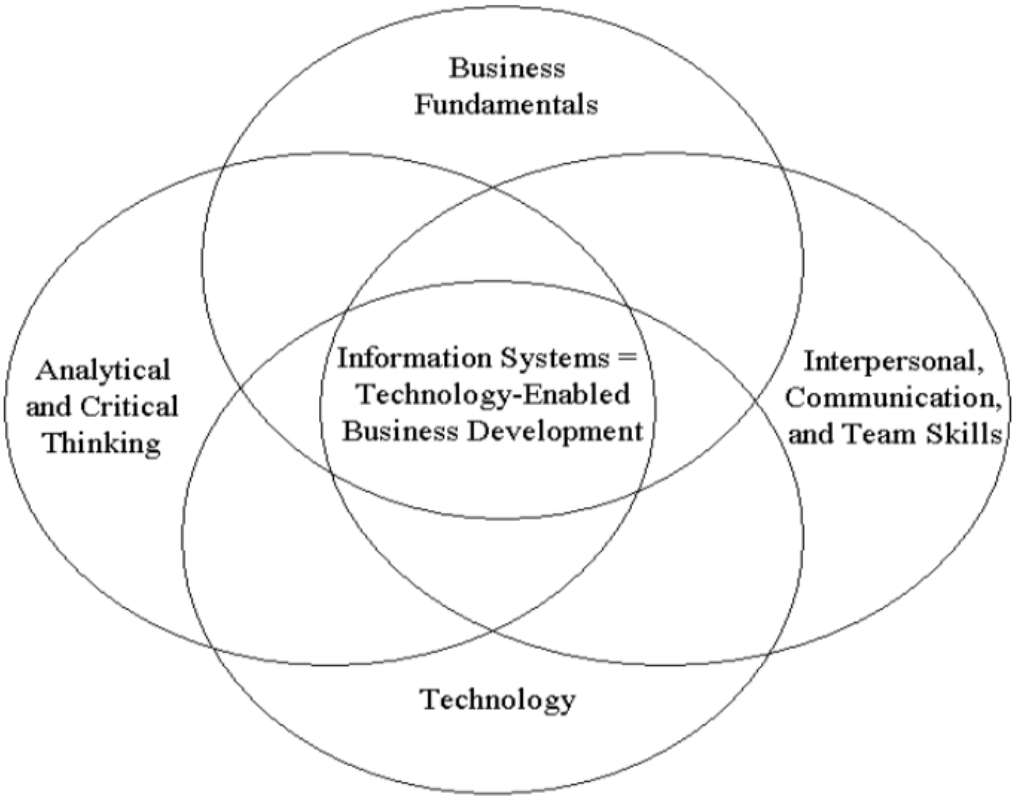

Figure 5 : IS2002 Degree outcomes

Source: Topi et al. (2010)

IS2010 is the latest curriculum developed by AIS and ACM. It is the first major revision to IS curriculum guidelines since 2002. This development was motivated by the rapid advance of the technological landscape available to practitioners and the new technological platforms that have been developed. Examples include: the increased need for global collaboration, increasing use of web technologies, the emergence of new architectural paradigms, such as service oriented architecture, customisation and implementation of Enterprise Resource Packages (ERP) or packaged software becoming more common than customised software development, use of mobile devices becoming more ubiquitous, and the establishment of infrastructure frameworks such as Control Objectives for Information and Related Technology (COBIT) and the Information Technology Infrastructure Library (ITIL) (Topi et al., 2010).

The IS2010 curriculum guidelines document acknowledges that its predecessor, IS2002 focused too narrowly on the business domain and acknowledges that there is an inability to apply IS curriculum globally and consistently. The IS2010 acknowledges that IS use and application exist outside the business environment and can be applied to domains such as law, biology, physics, sport, hospitality,

healthcare, etc. The word "business," in Figure 5, can be replaced with another appropriate domain. In order to allow for multiple domains being applied with IS contexts, IS2010 encourages the use of elective subjects to guide application to a many possible relevant domains. This implies that the focus of the field is becoming wider and the potential for more identity issues is increasing. The guidelines appear to have become less regulated and less inclined to a core discipline leaving more room for academic institutions to interpret and apply curriculum diversely and inconsistently. Although the curriculum update was welcomed and necessary there are those who contend its content. Kroeze et al. (2011, p. 382) raised concern that the removal of programing as a core subject would reduce the learners' ability to appreciate the analysis, modelling and managerial roles and thereby would remove the obligation to "engage in the development of reflexive knowledge," and thus placing an overemphasis on "instrumental knowledge," not allowing students to gain the real project experience necessary to prepare them for industry.

In addition to the narrow focus on the business domain, the IS2010 guidelines also acknowledge another shortfall of its predecessor; that traditional curriculum development has been too narrowly focused on North American business schools, and that flexibility of curriculum is necessary to allow for application and adoption of guidelines into differing educational contexts. As found by Brown et al. (2008, p. 65):

> Culture shapes students' views about IS as a field of study. It also predetermines an individual's communication preferences as well as behaviours. Problems often arise when the IT products which students are expected to use in their IS courses are not aligned with the students' cultural values. Particular technologies may hinder a student's ability to employ a communication style inherent to his or her culture. These communication styles are often crucial to a student's performance. One of the most significant differences amongst cultures is their traits of either individualism or collectivism. Some cultures tend to support the notion of collectivism, while others value individualism. Such cultural values may directly relate to a student's ability to work in teams. A lack of skills in this area may have a negative effect on student success.

Indeed a comical irony is present as while many see IT as a 'Great Globaliser,' "IT education has not converged to some worldwide standard" (Ezer, 2006, p. 438). In addition to there being a difference in the developing and developed world, Brewer et al. (2006) suggested that universities should consider the regional area as well as the institutional objectives in structuring curriculum.

Ezer (2006) identified a very clear example of differing curricula between the developing and developed world, in comparing the curriculum applied in India with that applied in the United States of America. Ezer (2006) identified the USA as being more liberal and more focused on social factors and social issues around IS. Factors such as assurance, security and human computer interaction, were more prominent in the American curriculum. These same factors were non-existent in the Indian IT curriculum. Being a developing country, with millions in poverty, Ezer (2006) found that India seeks to tie its educational agenda to the needs of the economy, thereby being more focused on the job market and having an instrumentalist approach to education. India's strategy is focused on being an outsourcing centre and its IT strategy is aligned with gaining competitive advantage by being more focused on technical and developmental aspects, and less on the social factors. A contrast is also evident when German is compared to the United States: Gill and Bhattacherjee (2009, p. 224) highlighted that: "MIS programs in Germany generally take the form of business informatics (Wirtchaftsinformatik) – highly technical programs that are more closely aligned with design science than behavioural MIS."

In summary, the two justifications put forward for IS2010 update are the advances in technology and the limitations of focusing on North American and business social contexts. These are in line with the twin perplexities suffered by the IS practitioner identified in Chapter 2 and subsequently projected onto academic institutions. The impact of these looser guidelines, combined with expressed needs to consider regional and institution objectives, could cause further diversity and inconsistency in the field.

4.4 Summary

This chapter began by discussing the role of universities in society. In section 4.1 it was argued that universities, in attempting to prepare practitioners for industry, also suffer from the twin perplexities of having to cater for different social contexts with differing and changing technology. With clear evidence of mismatches between industry expectations and academic output (Braun et al., 2005; Seymour et al., 2006), many feel joint ventures between academia and industry are essential in creating prepared graduates. Although this desire is expressed, there is a lack of execution. Hirschheim and Klein (2003, p. 253) went as far as to say IS academics live in "ivory towers" and their research is overly theoretical and lacks practical relevance.

With the lack of cohesion of academia and industry established, section 4.2 went on to argue that the academic side of the field also suffers from a lack of identity and has many differing perspectives. This is made obvious by the array of differing names (21 in total) with which departments identify themselves. This lack of agreement and differing perspectives led the discussion into section 4.3 where the effect of the identity crisis on IS curriculum was discussed. It was argued that curriculum updates have historically not met industry progress and their generic nature leaves openness to interpretation, thereby leading to inconsistent application. In addition, historical short comings such as an overly narrow focus on the business social context and a lack of acknowledgement of the differences between the developing and developed world, were highlighted.

It is clear that the lack of identity in the field has an effect on industry, academia and the relationship between industry and academia. As the purpose of this research is to study the role of academia in preparing IS students for industry, the following chapter will discuss the effect these factors may have on an enrolled, or potential, IS students.

5. The Effect of the Identity Crisis on Students

In the previous sections it was argued that conflicting ideologies and ideological boundaries lead a distance between academic research and practical application in industry. In addition, the effect of this lack of identity on academic institutions and its effect on IS curricula were discussed. It was established that IS is an open field with curricula that covers a vast range of intellectual territory and therefore is open to various/different interpretations. The differing applications and interpretations of priority were demonstrated by the fact that there is a vast array of names that academic institutions identify themselves by and the increasing generic and loosely defined curricula (Topi et al., 2010). This section examines the effect the differing applications and lack of standardised curricula may have on a potential or enrolled IS student.

Section 5.1 discusses how the presence of the differing names, presented in Chapter 4, and the lack of standardised curricula and differing approaches from different universities, may make a potential student feel perplexed about choosing a university. Section 5.2 discusses the pressure a student may feel in choosing a role or specialisation in the vast intellectual territory present in the field. Sections 5.3 and 5.4 then discuss the inadequacy of relying on the perspective of a single institution and the limitations of merely seeking credentials.

5.1 The Fear of Enrolling and the Challenge of Choosing a University

As established in the previous section, despite there being increasing demand for IT/IS jobs, the field is facing an enrolment crisis. It was suggested that the identity crisis, lack of standardisation and lack of certainty of the field could be a cause of this crisis. When considering enrolment from a student's perspective possible causes of this problem become apparent. Consider a student who wishes to enrol in a university as an undergraduate for the first time. Should the student wish to study physics, medicine or accounting the choice of university would be the most daunting as curricula is relatively standardised. Should the student wish to study IS however, the task of choosing a university would be more complicated and could potentially have far-reaching consequences in shaping potential career paths. As shown by Topi et al. (2010), there are 21 names which academic institutions use with which to identify their IS departments. In addition, the inconsistencies in interpretation and application of curricula and the choice of electives, encouraged by IS2010, would mean that the student would have to investigate and interpret the conflicting ideologies within the field and make value judgements even before having any sort of basis of understanding which universities would best suit their needs. In

addition, Saunders et al. (2008) found that high school guidance counsellors lack knowledge fully needed to understand and promote computer related degrees. A generational gap, as guidance counsellors are generally older, and a lack of marketing from academia were highlighted as possible causes for this lack of awareness.

Table 3 : Different university offerings in South Africa

	University	Abbreviation	Faculty	Department	Name of Degree	Unique Subjects	Source
1	University of the Western Cape	UWC	Faculty of Economic and Management Sciences	Department of Information Systems	BCom IS	Industrial Psychology	UWC (2014)
2	University of Cape Town	UCT	Faculty of Commerce	Department of Information Systems	BCom IS & BBusSci IS	Business Law, Business Ethics	UCT (2014)
3	Cape Peninsula University of Technology	CPUT	Business Faculty	No Undergraduate Programme			CPUT (2014)
4	University of Stellenbosch	Stellenbosch	Arts and Social Science	Information Science	BA in Socio-Informatics	Philosophy, Political Science	Stellenbosch (2014)
5	University of Pretoria	UP	Engineering, the Built Environment & IT	Department of Informatics	BCom Informatics	Elective Based, Mostly Accounting	Pretoria (2014)
6	Rhodes University	Rhodes	Faculty of Commerce	Department of Information Systems	BCom IS & BBusSci IS	Business Focused	Rhodes (2014)
7	Nelson Mandela Metropolitan University	NMMU	Faculty of Science	School of Computer Science, Mathematics, Physics and Statistics	BSc Information Systems	Graph Theory, Mathematical Modelling	NMNU (2014)
8	University of the Free State	UFS	Faculty of Natural and Agricultural Sciences	Computer Science and Informatics	BSc IT - Information Systems	Business Focused	UFS (2014)
9	North-West University	NWU	Commerce and Administration	School of Economic and Decision Sciences	BCom Informatics	Business Focused	NWU (2014)
10	University of the Witwatersrand	WITS	Faculty of Commerce, Law and Management	School of Economic and Business Sciences	BCom Information Systems, Bachelor of Applied Computing	Physics for Applied Computing	WITS (2014)
11	University of Johannesburg	UJ	Faculty of Management	Department of Applied Information Systems	BTech Information Systems and Technology Management	Artificial Intelligence	UJ (2014)
12	University of South Africa	UNISA	College of Science, Engineering and Technology	Department of Mathematical Sciences	BSc – Computational Statistics	Emphasis on Statistics	UNISA (2015)
13	University of Kwa-Zulu Natal	UKZN	College of Law and Management Studies	School of Management, IT and Governance	BBusSci in Information Systems and Technology, BCom in Information Systems and Technology	Business Focused	UKZN (2014)

Source: Listed in table

To illustrate this point further, consider the scenario of a South African high school student who wishes to enter a university. Brown et al. (2008, p. 69) found that "IS as a career is not well understood in high schools. As such students may venture into the IS stream without a clear understanding of where it will lead to." Table 3 illustrates the lack of standardisation, not only in the differing names the

departments identify themselves by (from Information Systems to Informatics and Decision Sciences), but also the differing faculties (or social contexts) that the departments place themselves in. Most of the universities have departments in some form of business domain (eight in total – UWC, UCT, CPUT, Rhodes, NWU, WITS, UJ and UKZN) where words such as commerce, law and management are common. Other universities take on a different approach: NMMU, UNISA and UFS place their departments in science-centred faculties, while UP has ties with engineering. Stellenbosch appears to be the most unique with their department in the faculty of "Arts and Social Sciences." The subjects around the major are also diverse. Consider UWC, the only university to include Industrial Psychology and the contrast between NMMU, which includes graph theory, and Stellenbosch which emphasises philosophy and political science.

Consider a high school student, unsure of their passion, unaware of what the study of "Information Systems" involves, but wishing to study something related to tracking "of new information technology and assisting incorporating it into the organisations strategy, planning and practices" (Topi et al., 2010, p. 13). It is possible that such a student could become perplexed with the eclectic offerings and find difficulty in drawing comparisons between the approaches. One could argue that choosing a university could be a naïve and uninformed decision leaving the student at the mercy of the universities' ideology.

5.2 Choosing a Role amongst the Multitude

It has been argued that the role of the IS practitioner is to facilitate the growth and strengthen the symbiotic relationship between an IT Artefact and the evolving needs of its social context. The facilitation of such an enhancement involves vast intellectual territory and a wide range of relevant factors such as psychology, sociology, cognition, computer science, strategy, marketing, accounting, operations, other disciplines that relate to the design, development, management, evolution and use of ICT (March & Niederman, 2012), behavioural science, decision science, organisational theory and operations research (Galliers, 2003).

As established in section 5.1, the vast array of priorities leads to universities taking differing approaches and placing emphasis/focus on different areas. In assessing the literature further, many relevant roles and factors become apparent. Richards et al. (2011) identified four categories of skills relevant to the IS field: 'Soft', 'Business', 'Technical' and 'Green', the latter being unique to the study and concerned with the sustainability of IT and an awareness of its effects on the environment. These

categories contained a total of 84 skills relevant to the field. As expected, the skills from these categories were radically different from each other. The soft skills category was rated as most important with skills such as 'ability to learn/lifelong learning', 'analytical/critical/logical thinking', 'integrity/honesty/ethics', 'business problem solving', and 'responsibility.' There were expressed needs for skills from other categories, which were radically different, such as 'change management,' 'testing' and 'sustainability engineering.'

In contrast, Chao and Shih (2005) identified five different categories of relevant skills, namely: 'End-User Support', 'Business Analyst', 'Training', 'Web and Interface Design' and 'Technical Writing.' Similarly to Richards et al. (2011), Chao and Shih (2005) highlighted vast contrasts in skills required, highlighting that while Business Analysts required testing, quality assurance, and database management skills, Web and Interface Designers require creative and artistic abilities.

With such a wide area of intellectual territory, the field is regarded as "one of the most dynamic fields that has ever existed" (Cappel, 2001, p. 1932). Lee et al. (2002, p. 52) identified that the turbulent nature of the field means that:

> The old promise of a single career path, programmer > analyst > project manager > IS manager, is being replaced by a new reality in which there is a diversity of IS career paths. IS practitioners' use of certain knowledge/skills can vary significantly, depending on their career and work experience. Even within a specific career path, IS practitioners are required to have different knowledge and skills as their careers progress.

It is clear that there is a vast intellectual area to cover with dynamic and changing career opportunities (Chao & Shih, 2005; Richards et al., 2011). As argued in Chapter 4, there is an inconsistency in the balance of priorities and areas of interest for learners and universities in the application and focus of curricula. One could therefore argue there is a lack of what constitutes IS skills. Reffell and Whitworth (2002, p. 428) present an analogy that an expectation of combined skills would be similar to "summarising squash, snooker, swimming and soccer under the single heading of 'sport' and then going on to believe that all relevant 'sporty' skills can be acquired."

In contrast to the accounting and medical fields that produce standard graduates as general practitioners who can choose to specialise later, the IS student has the pressure of making potentially

career defining decisions about specialisation during or even before the start of their undergraduate studies. A case could be made that such a decision would be an uninformed one. In addition to the pressure of having to choose a role/specialisation, the effect of teamwork must also be considered. Cappel (2001, p. 1934) identifies teamwork as the second most important non-technical skill for IS practitioners. In addition, Gargone et al. (2002), Kroeze et al. (2011) and Topi et al. (2010) all identify teamwork and team skills in a real project experience as crucial in helping learners develop skills necessary to gain analytical assessment and interpersonal and communication skills necessary for industry. It is possible that a learner in a project situation who is, unsure or unguided as to the nature of certain roles, may be forced or bullied into an undesirable role by their team mates.

5.3 The Pressure: Finding, Constructing and Reconstructing Truth

Ample evidence exists in literature, and has been discussed, to indicate that the IS field is one in which there is a conflict of ideology, fluid boundaries and debates of identity and legitimacy (Walsham, 2012). It was argued that there is a distance between Industry and academia (Hirschheim & Klein, 2003, p. 253) and a mismatch between academic graduate skills and industry needs (Seymour et al., 2006). Though there have been calls for a core focus and clear ideological boundaries, it was argued that the field does not contain authoritative figures that could enforce globally applicable curriculum. Furthermore, the latest curricula guidelines (IS2010) developed by ACM and AIS encouraged use of elective subjects to cater for differing social context (Topi et al., 2010), making them more generic and subject to inconsistent application and interpretation. Evidence of this diverse application and interpretation in the academic arm of the field was highlighted by the fact that IS departments have an array of different names with which they identify themselves. This was evident globally, as identified by Topi et al. (2010), and within South Africa as identified by the researcher in Table 3.

The results of these differing applications or ideologies in the field, between the academia and industry and within academia itself, could lead one to argue that the field does not contain any ultimate truth. The twin perplexities identified in the working definition (Chapter 2) not only effect the IS practitioner but also, as argued in Chapter 4, the academic institutions that seek to build theory and provide guidelines to support those practitioners. Rather than an authoritative truth (best practice or guidelines as demonstrated in Figure 4) from academia or a regulation body, one could argue that the dynamic nature of the field calls for practitioners to be able to construct theories and appropriate responses in the moment. As argued earlier, practitioners could operate without the need for any

strong consensus with their colleagues, as long as some outside community for support exists (Banville & Landry, 1989).

Whilst it is possible for practitioners to venture down their own paths, Aspin and Chapman (2012) argue that by making a claim in the IS field, one tacitly invites peers to check, criticise and contest one's claims. Whilst it is possible to create awareness of different standards, it is unlikely that any academic institution could possibly coherently cover all areas to a sufficient level of depth, and therefore would prioritise and guide the learner towards a subjective standard. The subjectivity that Aspin and Chapman (2012) identify leads one to conclude that the IS field is one that is not ruled by truth, but is rather characterised by practitioners independently embarking on a search for finding the truth for a particular situation. This section deals with issues of truth and subjectivity and how the lack of truth and need for subjectivity could affect a learner hoping to become a practitioner.

5.3.1 The Perplexities of Truth

The word 'truth' can be defined as "conforming to reality and facts" or "a verified and undisputable fact" (Dictionary.com, 2015). Varela, Thompson and Rosch (1993, p26) illustrate the concept of truth, perception and subjectivity by using colour. Colour in essence is the reflection of light of a surface. Colour is a physical property of an object with set parameters. The colour property:

> corresponds to the percentage of incident light at each wavelength that an object reflects. This percentage or ratio describes the way in which an object, by virtue of its physical constitution, alters the ambient light; it is therefore a stable property, one that remains constant through changes in illumination.

In the physical world (which is based on facts and evidence) colour has definition and set properties. However in the social world (which is based on perceptions and ideas), there is a different perception of colours. According to Varela et al. (1993), different species have different neurological capacity and some species cannot see certain colours. Within our species, there is the issue of language that effects the perception of colour. In English there are words to describe colours. However, there are many languages and in those languages there are different terms used to describe the same physical properties of an object that is colour.

Figure 6 : Colours as Identified by the Dani tribe

Source: Researchers constructed informed by Varela et al. (1993)

If one contrasts the standards of the Dani tribe of New Guinea to English, the contrast of truth becomes clear. The Dani only has two colours: 'white-warm' and 'dark-cool.' 'White-warm' describes colours such as red, yellow, orange and pink, while 'dark-cool' describes colours such as green and blue. It can be seen in Figure 6 that something that has a set definition in the physical world can be perceived in different ways based on language and culture. With the different perceptions, definitions and interpretations of colour, a purely objective individual would struggle to find a standard to follow with all the options available.

As argued in Chapter 2, the working definition of the field results in a practitioner being faced with the twin perplexities of enhancing differing and changing social contexts with differing and changing technological tools. Chapter 4 argued that these twin perplexities are also relevant for universities which can potentially struggle to develop globally applicable and relevant guidelines. If something as trivial as colour can cause great perplexities for an objective individual, consider the perplexities of a novice learner attempting to become an IS practitioner. Consider the vast array of possible social contexts a student may be faced with, in addition to the difficulty of keeping abreast of changing technology; lack of globally applicable curricula; distance between industry and academia; and debates of identity, ideological boundaries and legitimacy in the "fragmented adhocracy" that is the IS field. One could argue that IS truth or reality is a collective of subjective points of view or perceptions that forever adapt and evolve, based on circumstance. The following section further demonstrates the perplexities of truth on the IS student.

5.3.2 The Perplexities of Truth – Implications for Information Systems

In the same way that colour can be defined and interpreted in different ways, it has also been argued that the IS field is one which comprises a multitude of conflicting ideologies leading to inconsistent application and interpretations. It does not enjoy the comfort of having authoritative regulatory bodies and its curricula guidelines are applied differently in differing environments with there being a need for academic institutions to apply institutional objectives, regional objectives and political and legal needs in structuring curricula (Brewer et al., 2006). In developing IS2002, Gargone et al. (2002, p. 5) stated that their model curriculum should "guide but not prescribe." As highlighted in section 5.1, curricula must "adapt to its own needs, circumstances and characteristics" and it must "reflect the needs of the community it directly serves" (Brewer et al., 2006, p. 442). In addition, it must cater for a "dominant technology, industry or employer" by tailoring curricula for that environment (Brewer et al., 2006, p. 443).

The consequences this poses for a prospective or undergraduate students at an academic institution are that the differing academic stances may lead to the students' knowledge being limited to the interpretation, priorities and ideologies of the academic institution they attend or wish to attend. With the 21 differing names given to academic departments as identified globally by Topi et al. (2010), and the differing approaches within South Africa, identified in section 5.1, a prospective student may be perplexed and have difficulty drawing comparisons. In contrast to the Accounting student who would be entering an industry governed by established best practices and regulation bodies, the IS student will be learning a standard or best practice relevant to a certain institution or area. Aspin and Chapman (2012) argue that the notion of secure foundations and unshakeable building blocks is gone and that to claim to know something, is similar to the experience of standing on slippery wet logs as opposed to buildings blocks of solid granite provided by authoritative teachers. Rather than there being a solid theoretical basis that would guide actions and practices in industry, authors such as Raelin (2007) argue that theory and practice are inseparable. Theory is not a pre-ordained truth, but a necessary ingredient for performance.

One could reason that, should students be guided to a subjective standard (which is a form of limited truth) based on the ideologies and priorities of an academic institution operating in a 'fragmented adhocracy,' there would be differing subjective standards that define IS competency and therefore a lack of truth in defining competency. Raelin (2007, p. 497) argues that knowledge is perspectival and that any theories of reality or truth are "organically embedded in our culture and hence conditioned

by our point of view… we can't compare our views of the world to the world as if it exists independently of our views." Students would be guided to a version, or perspective, of truth, a subjective standard that could be interpreted and valued in different ways by differing constituencies in the field. A very clear example of differing values and perspectives were demonstrated in the earlier discussion of curricula in section 4.3 by Ezer (2006), in the contrasts of priority and focus between American and Indian curricula. To demonstrate the subjectivity associated with IS competency, a model developed by Dreyfus (2001) will be used. The model identified seven stages of competency for adult learners. These seven stages are described in Table 4. Each stage is described, and for each stage the difficulties in defining parameters for that stage demonstrating by contrasting the difference that Ezer (2006) identified in Indian and American curricula priorities.

In using Dreyfus' seven stages of competency as a theoretical analogy, it can be seen that the lack of truth and presence of subjectivity involved in developing competency in the IS field causes difficulty in defining parameters to categorise competency stages. One could argue that true IS competency is ultimately very difficult to define. In having to contend with this lack of truth and differing standards, the IS learner has the difficult task of having to become dynamic and adaptable not only with differing tools and methodologies, but in different situations and social contexts as well as to different standards defining their competency. Consider a scenario in which a graduate from a top Indian university declares "I am competent." Though this statement may be true according to Indian curricula and priorities, which devotes time to subjects such as chemistry, thermodynamics and physics that are non-existent in American curricula Ezer (2006, p. 433), such a statement may not be true by the standards of American curricula or priorities and vice versa. It is possible and likely that this reality will build an intrinsic insecurity in the learner. To operate in this 'fragmented adhocracy' within fluid ideological boundaries and contend with this intrinsic insecurity rather than relying on ultimate truths or theory, it is necessary to adopt a constructivist approach and recognise that "theory is not preordained but constituted as a living construction to capture the useful ingredients for performance" (Raelin, 2007, p. 500). As there is no pre-ordained theory or truth, the graduate must become an independent investigator of truth. One could argue that this cannot be achieved in one academic institution as in order to achieve mastery, "it is important to have not one but several masters to avoid becoming transfixed to any one world view" (Raelin, 2007, p. 504).

Table 4 : Dreyfus Stages

Stage	Description	Difficulties in defining parameters
Novice	In this stage a task is broken down by an instructor and given to a learner in context free parts. The learner follows instructions and rules.	Ezer (2006) argued that India and the United States have vastly differing curricula. The former having more technical and developmental focus and the latter more social and design focused topics. In breaking down tasks into context free parts the instructions and rules that are followed will be different based on the differing circumstances. This results in differing competency based on the multiple standards or approaches.
Advanced Beginner	In this stage the learner has been through situations and begins to gain situational analysis skills and also an understanding of the context around the tasks he or she performs.	In this stage the context around the tasks differ. A learner in the curricula may perform well when judged by the standards of those curricula but would perform poorly when judged by the American standard and vice versa.
Competence	At this level of experience the learner is aware of the many potential relevant elements in the context of their task and is overwhelmed by the choice of prioritising and cannot make a distinction between important and trivial factors.	At this stage the learner may become aware that they are operating in a 'fragmented adhocracy' and that the perspectives and 'truths' they were taught are merely guidelines. The learner would be aware of differing ideologies and standards but could struggle and feel 'overwhelmed' by choice.
Proficiency	The detached stance of following rules is replaced by involvement and engagement with the situation. Through experience and resulting positive and negative emotional experiences the learner will be able to have situational discrimination skills and a sense of the appropriate responses.	The learner is more detached and specialised and can prioritise by themselves based on their past experience. In doing this the learner could develop their own version of IS truth which may or may not be aligned with the academic institution they attended.
Expertise	The proficient performer can see a task and decide what to do. The expert has an arsenal of experience and has a more intuitive, less thought intensive, sense of appropriate action.	One could therefore argue that the 'situational discrimination skills' necessary to gain experience and thereby reach this stage cannot be achieved or instilled by an academic institution. The institution may be limited in providing adequate variations of case studies and/or scenarios in order to facilitate development of a metaphorical 'arsenal of experience.'
Mastery	To achieve mastery the learner must have their own sense of style. This is impossible when working as an apprentice under one master. The learner must move on and work under many masters in different situations to develop their own style.	With the difference of methodologies, ideologies and lack of agreed standards present in the 'fragmented adhocracy' a practitioner can only achieve mastery if he or she has worked in different regional areas, in social contexts with different methodologies and in so doing have their own sense of style. One could argue this is not possible if a learner strictly adheres to the standards, methodologies or ideologies taught by a single academic institution.
Practical Wisdom	A learner has practical wisdom when they acquire an understanding of the cultural aspects around their field. Such aspects are so "embodied and pervasive they are generally invisible."	One could argue that the multidisciplinary, constantly changing nature of IS and the lack of formal regulator bodies make practical wisdom unattainable. As stated by Aspin and Chapman (2012), any claim made in the IS field could be considered a tacit invitation to criticism, cross checking and contention. For the purposes of this research, someone with practical wisdom could be thought of as one who could recommend their own style as best practice to industry.

Source: Researchers analysis informed by Dreyfus (2001) and Ezer (2006)

The consequence of this subjectivity and the need to find some form of subjective truth mean that should the student graduate, choose to practice in an environment that differs from their academic institution, they must independently investigate the standards, priorities and ideologies of that

environment. In the Accounting field, the work of making these difficult decisions of defining truth and parameters for competency is handled at the very top of the hierarchy by the accreditation and regulatory bodies. The accounting learners will need to familiarise themselves with the best practices and legal regulation. In contrast, the IS field has less established best practices and consists of a much wider, and widening, area of situations and possibilities. This contrast demonstrates to us that it is clear the graduate of an accounting programme and the graduate from an IS programme will be walking into completely different environments after graduation and will be operating in completely different psychological mind sets. Whilst the accounting learner is presented with truth in the form of best practices and GAAP, the IS learner must seek to establish their own truth based on circumstance. A case could be made that mere qualifications and credentials are inadequate in the presence of differing truths. The inadequacy of credentials and merely relying on qualifications are discussed in the next section.

5.4 The Inadequacy of the Credentialist Mindset

A lack of IS truth or reality, has been established, and the need for learners to independently investigate the truth rather than simply submitting to the views of a single academic institution, has been raised. Baron, Stalker, Wilkinson and Riddell (1998, p. 53) found that learning in many cases is no longer viewed as a means of individual and social emancipation, but is often and commonly seen as an "investment" that must have its cost minimised. The effect of viewing learning as an investment is that it encourages learners to value credentials over learning, and thereby operates in a credentialist mindset. The credentialist mindset is one in which a learner draws motivation from gaining credentials and qualifications (thereby boosting image or status) rather than being motivated to fulfil a need by application of knowledge gained.

Perelman (1993) describes the traditional classroom approach to education as the last stronghold of socialist economics and a relic of the industrial era. He argued that effective learning actually takes place in the context of real-life experiences and that learners derive little value from the classroom. Perelman considers the classroom as an environment where the main focus is not learning, but rather screening out and maximising failure of students in the name of standards so that the minority of remaining students can be given credentials and labelled as excellent. Campbell (2011, p. 34) raised concern that the "more any quantitative indicators used in social decision making the more that indicator will be subject to corruption pressures and therefore more apt to distort and corrupt the

social processes it was originally intended to monitor." Campbell (2011) gives a simple example of police departments when, being evaluated by the percentage of crimes solved, resulted in police failing to report all complaints that were raised and only recording those that were solved.

The No Child Left Behind act, implemented in the United States, provides a good case study into the limitations of an overemphasis on evaluation or what Perelman's considers as "screening out." In essence, the act attempted to assign accountability to teachers by creating a system of severe penalties for underperforming schools. The effects of "screening out" can be destructive as in many instances when teachers refer to learners as having understood "is actually the extent of the match between the pupil's personal understanding and the target understanding set by the teacher" (Entwistle, 2000, p. 9). The high stakes nature of the act has led to it being described by Nichols and Berliner (2007) as a weapon of mass destruction which provides weak administrators with a mechanism to control the teaching behaviour of a minority of teachers. The use of pressure to motivate is limiting in its ability to empower people and inspire growth, but is rather limited to a transactional system of rewards and punishments, leading to subjects only having instrumental value. Callet (2008) has similar criticisms, stating that the focus from learning to testing (the reduction of genuine instruction and its replacement with judgement based on one test score fuelled by superficial test preparation) resulted in worsened practices. Nichols and Berliner (2007) found the effects of high stakes testing were felt socially as well: in some schools the quality of life was reduced as some schools went as far as to reduce food quantities and recess times in order to allow for more test preparation time. Rothstein (2009) found that this overemphasis on testing caused a widening of the achievement gap pushing disadvantaged learners further behind. Nichols and Berliner (2007) concluded their discussion by stating that failure to teach and test students in a way that promoted their growth, could be considered bigotry.

Fevre (1997, p. 14) highlights a common attitude of seeking education and training in the hope of "getting a better job," rather than educating and training oneself in the hope of preparing oneself for work. The danger of this is that higher participation in educational endeavours has dubious value as students may increase their credentials rather than their understanding. This point is especially relevant to the IS field as a distance between industry and academia is cause for a mismatch of priorities (Hirschheim & Klein, 2003). In addition, these concerns are amplified when the difficulty in finding truth in the IS field, as discussed previously, is considered. As differing academic institutions

have differing priorities and therefore produce learners with differing credentials. Aspin and Chapman (2012) found it to be generally accepted that effective learning must be self-directed, self-internalised and self-monitored. Traditional education in which a generic student was viewed as a recipient, like a jug, into which knowledge and facts were poured, is inoperable. Furthermore, Aspin and Chapman (2012) found that traditional teaching-centred learning is too instruction centred and linear when in reality learning does not necessarily proceed in a linear fashion.

If one holds the premise that possession of credentials is alone inadequate to prepare a student for the field, that consists of a multitude of viscous social contexts and ever changing technology, and that overemphasising of evaluation methods amount to bigotry, the following question can be raised: "What do we want our students to achieve from their lessons – a passing grade or knowledge that can be useful to them in the course of practice?" (Raelin, 2007, p. 504). Rather than being output oriented (gaining credentials), IS practitioners need to become process oriented by acquiring lifelong learning skills in order to contend with the messy, nonlinear and ill-defined problems that are the hallmark of changing workplace demands (Kroeze et al., 2011). Schön (1983, p. 40) demonstrates that real-world problems "do not present themselves as givens." Bryant and Land (2012) call for IS learners to be self-reflective and self-corrective seeking to advance and grow in ways that are autonomous, self-sustained and self-governed. An attitude of existentialism or lifelong learning can be described as similar to Candy's (1991, p391) attitude of 'autodidaxy' – which can be described as the ability to teach oneself by having a sense of personal control in one's learning by "creating a climate of self-direction and inquiry."

5.5 Summary

The chapter was focused on presenting the potential difficulties the identity crisis could impose on a potential or enrolled learner. The essence of this chapter is demonstrating a fundamental lack of truth that affects learners throughout their involvement with the field. Section 5.1 demonstrated the differing approaches taken by universities globally and by South African universities. It was argued that it is possible and likely that a high school student may become perplexed in choosing a university. This places the burden of contending with a lack of truth on a learner before they have enrolled in the field. This lack of truth continues to plague learners during their studies. As argued in section 5.2, a student may feel perplexed in choosing a role or specialisation in the vast intellectual territory, where as much as 84 relevant skills exist in the field (Richards et al., 2011). Furthermore, after enrolling,

choosing a specialisation, and completing their studies, learners are still faced with a lack of truth. Curricula are generic by nature, rather than prescriptive, and vastly differ in differing regions (as demonstrated by Indian and American approaches). This leads to learners facing different standards when presenting themselves to employers. In a field where an intrinsic lack of truth is built into its nature and effects learners before, during and after their studies, the seeking of credentials, which was defined as the credentialist mindset, and superficial test preparation, was argued to be inadequate. In place of this a characteristic must be instilled to assist the learner in being constructive in their approach, rather than seeking to rely on a truth presented to them; enabling them to gain the consciousness necessary to create different truths in the changing and uncertain nature of the field.

6. The Required Mindset of Information Systems Students

In Chapter 5 the difficulties the nature of the field could cause for a potential or enrolled student were discussed. It was argued that there is a lack of truth in the IS field and subsequently differing standards may lead to great perplexity in choosing or relying on the credentials or perspective of a single university. In addition, in contrast to medical students who graduate as general practitioners, it was argued that IS students face the additional pressure of having to choose a, or multiple, focus areas, or roles during their studies. This was highlighted as a possible uninformed, career defining moment.

All these factors combine to suggest that a student may feel insecure or perplexed by the differing standards and may have difficulty in choosing a standard to adopt amongst the multitude. It is clear that there are many challenges placed on a potential or enrolled IS learner. As argued in Chapter 5, the guidance, rather than prescription, provided by curricula, causes inconsistent truths, and "general propositions rarely capture the full truth of a rugged environment" (Myers et al., 2011, p. 363). Crawford et al. (2006, p. 732) go as far as to state that propagating "best practices" or "one best way" with a lack of empirical or theoretical foundations, is almost criminal.

In the absence of truth, best practice or ultimate reality, it could be argued that it is not possible for a learning environment to be standardised or changed to capture all the needs of the field. In addition, the persistent turbulence in the field mean that any attempt in this endeavour would be short lived. One could argue rather, that changes to the attitude instilled within the students that would prepare them for the nature of the field, are valuable. One could investigate whether existential characteristics are valuable in IS students' development. The purpose of this research is to investigate the value and/or usefulness of instilling existential characteristics in learners, and how this can be achieved. Therefore, this chapter is dedicated to discussing existentialism, the path an existential learner may follow, as well as discussing existing literature about existential techniques in education. Through this process a theoretical framework that will be tested in the research process, will be developed.

6.1 Defining Existentialism

Existentialism can be defined as: "a philosophical attitude associated with Heidegger, Jaspers, Marcel and Sartre, and opposed to rationalism and empiricism, that stresses an individual's unique position as a self-determining agent responsible for the authenticity of his or her choices" (Dictionary.com,

2015). Gardiner (1988) concurs with this definition and elaborates, explaining that the existential characteristic can be attributed to people who have their attention directed towards their own nature. In doing so, people with an attitude of existentialism will recognise that their talents, inclinations and passions are within their power to cultivate. They take responsibility for themselves rather than treating their nature as unalterable. Rather than submitting to their nature, they regard it as a challenge. This involves development of self-knowledge beyond mere contemplation, and rather reflecting on oneself.

Those with a strong sense of existentialism consider themselves as independent entities who look inward for ultimate responsibility and accountability. They recognise the value of individuality and through interaction, reflection and action based on their own standards and wills, seek to advance. One could argue these characteristics to be essential in contending with the lack of truth and the multitude of ideologies in the field. Rather than allowing an external factor, such as the nature of the field; the ideology of a single institution, region or company; to shape them, existential IS learners must direct their attention to their own nature and seek to explore the complexities of the field and either align their efforts with constituencies that share their standards and wills, or establish new ones and make new contributions. This involves "distinguishing natural rewards, building natural rewards into work, choosing pleasant surroundings, building naturally rewarding activities into work, focusing on pleasant aspects of work, and focusing on natural rewards rather than external rewards" (Stewart, Courtright & Manz, 2010, p. 191). As discussed by Dreyfus (1999, p. 17), the characteristic of existentialism causes a person to throw themselves into an activity with "passionate involvement."

6.2 The Existential Path

Understanding the path towards competence that an existential learner may follow will assist in creating a better understanding of existentialism. Kierkegaard's three spheres of existence (aesthetic, ethical and religious) can be used to describe this path. These three spheres of existence, can be used as a theoretical lens to enhance the description of the process and stages of existential learning. Kierkegaard's concepts are generic and dynamic and although they were put forward more than a century ago, they have continuously been used in a wide range of academic research. Three examples are listed next:

- In 1999, Hubert Dreyfus used Kierkegaard's three spheres of existence to explain the difficulty in using the Internet as an education medium in his paper "Education on the Internet: Anonymity vs. Commitment."
- In 1996, Yaroslav Senyshyn used Kierkegaard's aesthetic sphere to asses musical performance in a paper titled "Kierkegaard's Aesthetic Stage of Existence and its Relation to Live Musical Performance."
- In 2006, Thomas Smith used Kierkegaard's concepts to write a PhD in English literature. His dissertation was titled, "Multiple voices and the single individual: Kierkegaard's concept of irony as a tool for reading The Great Gatsby, The Sun Also Rises, Mrs. Dalloway, and Ulysses."

The explanations of each sphere listed below are adapted from Dreyfus (1999) and Gardiner (1988). Kierkegaard's three spheres relate very closely to his concept of existentialism and to Dreyfus' (2001) seven stages of adult learning that were discussed in Chapter 5. It is important to recognise that the stages are not mutually exclusive or linear.

6.2.1 Aesthetic Sphere

Kierkegaard describes this sphere as one where a person is not enlightened. The person is in a sea of information and has no means to process or channel it. They gather information but can only make a distinction about what information they enjoy gathering. There is no ability to distinguish the important from the trivial. Dreyfus (1999, p. 17) describes such a person as an anonymous spectator who "takes no risk" and thereby has no commitment or involvement with tasks. Gardiner (1998) describes Kierkegaard's aesthetic individual as one who has no coherency in their lives. Rather an aesthetic individual could be allowing "what happens" to govern their behaviour (Gardiner, 1988).

The words "what happens" could be related to Aspin and Chapman's (2012) description of traditional education where the learner's mind as a jug into which knowledge is filled. This sphere could also be related to Dreyfus' (2001, p. 167) novice and advanced beginner stages where knowledge is context independent with no personal relevance for the learner.

6.2.2 Relation of the Aesthetic Sphere to the Information Systems Field

As established earlier, the IS field can be described as a fragmented adhocracy. The multitude of confliction ideologies and disagreements about identity and best practices could be seen as the

metaphorical sea of information that perplexes the IS learner. The open nature of ideological boundaries and inconsistencies of curriculum can cause potential learners to be hesitant to enrol (Topi et al., 2010; March & Niederman, 2012). Learners in this sphere would be governed by 'what happens' and would fall into Dreyfus' (2001) novice and advanced beginner stages of competency. They would be made aware of all these conflicting elements and perspectives, but will be too overwhelmed and thus unable to assess the relevance or worth of these elements. A learner in the aesthetic sphere would subscribe to a perspective to gain the basic and fundamental skills in isolation of each other. They would be passive and lack the initiative and existentialism necessary to take responsibility for choosing and committing to other perspectives, thereby enhancing their development. Rather, it could be argued that the learner viewing the learning as an investment or consumption that is set to yield a return (Baron et al., 1998), causes the learner to have a credentialist perspective on the task of learning. Although this stage may be portrayed as one in which the learner is not enlightened, it is useful for teaching isolated concepts on the foundational level.

6.2.3 Ethical Sphere

Gardiner (1988) highlights a contrast between the aesthetic individual and an ethical individual describing the latter as one who consciously and deliberately takes responsibility for their personal traits. An ethical individual is one who seeks to become conscious of their limitations and then recognises a need for identity and purpose. There is a recognition of a need to look inward and move past external factors and circumstance (Stewart et al., 2010). The learner is no longer satisfied with a sea of information, but rather seeks to break that information down for serious purposes, through conscious and deliberate alignment to certain perspectives and with commitment to involved action (Dreyfus, 1999, p. 17). This involves the learner taking the initiative to learn for "one's own sake" or one's "own account for the sake of the satisfaction it yields" (Williams, 2000, p. 86). Through making commitments and seeing perspectives the learner will be able to distinguish the relevance of various sources of information. In addition, the commitment to a certain perspective may allow the learner to feel "elation at their successes and sorrow at their failures" (Dreyfus, 1999, p. 18), thereby creating a sense of identity based on the commitments they have made. The ethical sphere can be related to Dreyfus' (2001) competence, expertise and proficiency stages discussed in Chapter 5. Dreyfus (2001, p. 169) argues that lack of emotional involvement and lack of risk lead to "stagnation and ultimately to boredom." Furthermore, Dreyfus (2001, p. 170) argues that only when the detached consumerist mentality of the aesthetic sphere, or the novice and advanced beginner stages are replaced with involvement, will the necessary positive and negative emotional experiences necessary for deciding on perspectives and commitments develop within the learner.

6.2.4 Relation of the Ethical Sphere to the Information Systems Field

It has been established that the ethical sphere is one in which a learner is no longer satisfied with the sea of information, but rather seeks to align themselves with perspectives through identity forming commitments. As argued in Chapter 3, there are many conflicting ideologies in the field. In addition, Chapter 5 showed the dynamic nature in the field with the vast intellectual territory where as many as 84 roles (Richards et al., 2011) in five differing categories (Chao & Shih, 2005) were identified. Therefore, one could conclude that an IS learner in the ethical sphere could pick a certain role or align themselves to a certain ideology, thereby forming their identity. Making commitments can result in learners shaping an identity and would involve recognising that they are not empty vessels, but rather responsible for taking charge of their talents, inclinations and passions. Through experience the learner will develop the situational discrimination skills and 'arsenal of experience' of the competent and proficient learner (Dreyfus, 2001). The existential attitude will enable the learner to consciously and deliberately take responsibility for applying the chosen theory in differing circumstances. Such initiative will require motivation as it is "unlikely that students will immediately or without provocation assume responsibility for the learning environment, given their often conventional socialisation as empty vessels" (Raelin, 2007, p. 510). Dreyfus (2001) suggests that such provocation cannot be found in commitments from a once-off or linear objective endeavour, but rather involve subjective assessment and engagement with multiple perspectives and ideologies. Such a journey would involve making serious, long-lasting commitments (Dreyfus, 1999).

6.2.5 Religious Sphere

It is a common misconception that Kierkegaard's religious sphere is one that promotes Christianity. Kierkegaard's religious sphere is one in which an individual devotes himself to a cause. This cause could be a craft, a career, a love relationship or even a sport. In the ethical sphere commitments can be made in several areas. A religions commitment on the contrary is one in which commitments are irrevocable and where nihilism is blocked. Dreyfus (1999, p. 19) describes a religious commitment as:

> Not one that I choose nor the ones that I am obliged to keep because of my social role. Rather, these special commitments are experienced as grabbing my whole being. This commitment determines who I am and what will be a significant issue for me for the rest of my life. But, of course, such a commitment is risky. One's cause may fail. One's lover may leave.

Dreyfus (1999, p. 19) stresses the greater feeling attached to risks and where one would "confront the danger and harsh judgement of existence", thereby deepening the feelings around the elation of

success and the disappointment of failure. The learner becomes emotionally involved with the material and this leads to growth and development. Part of instilling this involvement involves moving away from simulated learning, which is a "risk-free game," and seeking commitments without which no mastery can be achieved.

Dreyfus (2001, p. 170) projects this sphere of existence onto his seven stages of competency, stating that the commitment of apprenticeship will enable learners to feed off an expert's "vast repertoire of situational discriminations." Dreyfus (2001, p. 171) also stresses the need to work under different experts in order to avoid cloning and to help the learner move out into mastery and develop their own sense of style. This is essential as ultimate reality does not exist. "We can't create our views of the world to the world as if it exists independently of our views" (Raelin, 2007, p. 509).

6.2.6 Relation of the Religious Sphere to the Information Systems Field

The "special commitments" to which Dreyfus (1999, p. 19) refers, will result in greater involvement, commitment and becoming emotionally involved by taking risks with tasks. The learner would feel the elation of success and disappointment of failures. By being exposed and involved with many differing masters, the learner will develop a reservoir, or arsenal, of past experiences in differing situations with differing subjective truths that will enable them to build their own sense of style. Students will become "more autonomous in their actions, more reliable in their assessment of their own capacities and developmental needs, and more capable of accepting greater levels of responsibility for their own and other's actions" (Raelin, 2007, p. 509). Intuitively and in other fields, one may conclude that the learner would then align themselves to a truth and become a religious advocate for it. In contrast, the IS learner will learn by the disappointments of applying truths incorrectly, and the elation of applying truths correctly in doing so. Rather than becoming an advocate for a single truth, an attitude which Crawford et al. (2006, p. 732) described as criminal, the learner will gain an understanding of the true nature of the "fragmented adhocracy", thereby recognising the relativity and fluidity of IS truth. Rather than express commitment to a certain truth, the learner would recognise the need for differing truths to be applied in the vastly differing circumstances. Rather than making a religious commitment to a truth, the learner would make a religious commitment to the adventurous journey in a field where there is an ever-pressing need to independently investigate the truth with a subjective interpretive approach to dynamically defining truth for a particular circumstance.

6.3 Interventions that can instil Existentialism in Learners

In the previous sections the concept of existentialism was introduced and presented as a possible characteristic that can help students contend with the lack of truth present in the field. In this endeavour the three spheres of existence can aid as a theoretical path that a learner follows towards competence.

Upon closer examination of some key phrases from the concept of existentialism and the three spheres of existence assisted the researcher to identify three categories of existential activity. These three categories could be thought as defining elements of the theoretical framework this chapter aims to develop. The first of these categories is the category of "Psychological Ownership." The word "psychological" is defined as "of, affecting, or arising in the mind; related to the mental and emotional state of a person" (Dictionary.com, 2015). This category involves the learner moving past a passive mentality and taking control of their learning and having an emotional involvement. The second category is that of "Reality." It involves the learner acting in real situations with real consequences thereby "confronting the danger and harsh judgement of existence" (Dreyfus, 1999, p. 19) resulting in an amplification those emotional experiences. Finally, the third category of "Reflection" involves the learner looking back and adjusting their approach based on those emotional experiences.

These three categories are presented in Table 5. Quotes from the literature discussed are used in a support of their relevance. Consider the first category of "Psychological Ownership." The description of the three spheres of existence clearly shows a causal relationship between Psychological Ownership and growth. In the aesthetic sphere the learner is the anonymous spectator that Dreyfus (1999, p. 19) described whilst in the ethical sphere they begin consciously and deliberately taking responsibility. This leads to the religious sphere where they "make special commitments" that grab their whole being. Consider the category of being in touch with "Reality." Once again the description of the three spheres of existence shows a causal relationship between doing real tasks and growth. In the aesthetic sphere the learner "takes no risks" while in the ethical sphere the learner acts in real situations and feels elation at success and sorrow at failures. In the religious sphere the degree of emotional involvement is greater by the learner being more committed and having to "confront the danger and harsh judgement of existence" (Dreyfus, 1999, p. 19).

The final category is that of "Reflection" or looking back and contemplating. This category also shows a causal relationship with growth through the three spheres of existence. In the aesthetic sphere the learner has no experience to reflect on and is unable to filter out trivial elements. Through acting in

real situations the learner progresses into the ethical sphere by recognition of the responsibility for developing self-knowledge and develops discrimination skills and arsenal of experience. This leads to the religious sphere where learners can "feed off experts" and through their own experiences develop their "own sense of style" (Dreyfus, 1999, p. 19).

Table 5 : Trends in the Three Spheres of Existence.

Tendency/Sphere	Psychological Ownership	Reality	Reflection
Aesthetic	Learner is an anonymous spectator	Who typically "Takes no risk"	And is unable to filter trivial elements
	Submission: learners allow "what happens" to govern their behaviour		
Ethical	Learners start consciously and deliberately taking responsibility for their "talents, inclinations and passions"	By acting in real situations learners feel "elation at their successes and sorrow at their failures"	And consider self-knowledge beyond mere contemplation
	The learner makes commitment, with consequences, to a certain perspective	And forms an identity based on chosen commitments	Thereby developing situational discrimination skills and an arsenal of experience
Religious	The learner makes special commitments that grab their "whole being"	By being an apprentice the learner takes a big risk as: "One's cause may fail. One's lover may leave"	Ideally the learner can feed off experts and develop a "vast repertoire of situational discriminations"
		The learner has greater feelings attached to risks as they would "confront the danger and harsh judgement of existence"	This results in their building their own sense of style

Source: Researchers construct, informed by Gardiner (1988), Dreyfus (1999), Dreyfus (2001), Raelin (2007), Aspin and Chapman (2012)

The concepts put forward are generic and abstract therefore, the next sections are dedicated to examining existing literature about each of the identified existential characteristics. This literature will help further define and aid the understanding of each of the categories identified by the researcher.

6.3.1 Psychological Ownership

As discussed, progression from the aesthetics sphere of existence involves a learner moving away from an anonymous spectator role to one who consciously and deliberately takes responsibility for their own development. A learner must avoid reliance on others, but rather seek to develop their own talents, inclinations and wills, challenging them to make emotional commitments that grab their

whole being. The description of this tendency can be aligned to the characteristic of psychological ownership of tasks or exercises that exist in educational literature.

Entwistle (2000) argues that deeper approaches to learning will result in higher levels of understanding through extracting personally relevant meaning, thereby allowing a learner to personally shape understanding. Froehlich, Segers and Van Den Bossche (2014, p. 49) concur that learners who already had a deep approach to learning required "less facilitation" than learners who had been taught with other approaches. Furthermore, Entwistle and Peterson (2004, p. 411) argue that a learner-centred or learner-driven approach will result in more engagement with the material. In these approaches learners will seek to "make sense of ideas for themselves", thereby allowing learners to shape an understanding based around transforming information into "personal meaning" based on their own talents, inclinations and wills. This is essential as "learning approaches are not set traits, but are chosen anew for every task" (Froehlich et al., 2014, p. 32).

Upon testing this theory, Entwistle and Peterson (2004, p. 419) found that students who were accustomed to independent learning provided more strategic solutions when faced with problems. Lynch, Goold and Blain (2004, p. 440) found that the presence of intentional ambiguity in instructions can lead to more independent thinking and "a deeper understanding and aspiration for the wider opportunities" associated with a task than initially anticipated. Furthermore (p. 441) it was found that many wanted "varying levels of flexibility and freedom" in order to make tasks their own. The reliance of a teacher will fade, through the removal of hints and modelling, and the learner will become more skilful through taking on more. This can be compared to the removal of metaphorical "scaffoldings" which results in students building confidence in order to master skills required (Collins, Brown & Newman, 1990, p. 17). Moore, Marshall, Judge, Moss, Gilroy, Crocker and Zusman (2014, p. 121) concur, stating that transparent collaboration, rather than authoritarian dictation, in apprenticeships can lead to learners taking responsibility for themselves.

Druskat and Pescosolido (2002) found that an experience of psychological ownership, through reduced supervision, increased decision-making power over work or outcomes which led to strengthening the feelings of responsibility and influence. Reffell and Whitworth (2002, p. 433) use an analogy of learning a language to describe the characteristic of psychological ownership:

> one could become 'literate' at a basic level merely by learning vocabulary and grammar, but to become truly fluent, one must ideally immerse oneself in cultures and environments where a language is spoken. Individuals should be given the skills to act autonomously and communicate within information domains and public spheres. They should be able to become participants in them, not just passive observers: encouraged to produce information, and criticise what already exists, not just passively consume it.

By merely learning vocabulary and grammar that is presented to them, would place a learner in the aesthetic sphere of existence where they would be passive recipients who wait to be filled with knowledge. However, by taking ownership and starting to produce or criticise would lead to the learner progressing and enable them to "act autonomously", thereby advancing themselves.

To move out of the aesthetic sphere of existence, the learner must move out of the mindset that they are "empty vessels" (Raelin, 2007, p. 510) or metaphorical jugs, or recipients who need to be filled with knowledge (Aspin & Chapman, 2012). Rather, literature calls for learners to be self-reflective and self-corrective, seeking to advance and grow in ways that are autonomous, self-sustained and self-governed (Hauhart & Grahe, 2010; Bryant & Land, 2012). This would involve their taking ownership or control of their own learning endeavour and seeking an independent, self-motivated journey of development (Candy, 1991). Jordi (2010, p. 194) speaks of "intentional" actions that would result in "stretching" one's own experiences forward. This involves learners being autonomous, reliable in their sense of self awareness, and being more inclined to accept their actions as their own responsibilities (Raelin, 2007, p. 509).

In summary, the literature suggest that the characteristic of psychological ownership can be described as a learner taking responsibility for their learning and seeking to apply knowledge to personally relevant problems. The literature suggests this willingness to take ownership can be achieved by methods such as intentional ambiguity, increased decision-making power, and the gradual removal of metaphorical scaffolding. All these would result in the learner becoming more autonomous, building confidence, and establishing their own sense of style, thereby advancing towards mastery and the religious sphere of existence.

6.3.2 Being in Touch with Reality

It is clear from the theory of existentialism and existing literature presented in the previous section, that psychological ownership will assist a learner in enhancing their ability. Jordi (2010, p. 190) raises a point stating that any consciousness is stimulated by external interactions such as "ideas, images, sounds, smells, tastes, and textures." In having these interactions, one engages with them and through experiences one develops meanings and feelings linked to "internal memories, thoughts, and emotions." Candy (1991, p. 199) concurs, arguing that even an autodidacts actions arise from a problem or situation, would not be as effective in solitude.

Jordi (2010, p. 194) argues that in order for one to develop and grow, even if that growth is self-driven and avoids predictability, one must experience some form of outside stimulus to feel the elation of success and the despair of failure that are crucial to development. There are many who argue that integrating learning with real-life situations is a fundamental ingredient in enabling learners to consciously and deliberately take responsibility for their own development (Van der Merwe, Scott & Weimann, 2010). Froehlich et al. (2014, p. 31) highlight that often real work situations can lead to learning that is "a by-product of some other activity, and may happen unconsciously or incidentally." Bassellier, Reich and Benbasat (2001) argue that a person's world view is influenced by actions, commitments and involvement. In learning from these experiences, the two elements of intensity and breadth affect the quality of learning from experience. Intensity represents the degree to which the task has relevance to the learner (intensity or responsibility taken), whereas breadth represents the degree of differing tasks with which the learner has been involved. This suggests that a learner must not only feel connected to, or be the owner of the task, but must also be exposed to differing real tasks.

Crawford et al. (2006, p. 727) argue that in order to be effective in meeting the "demanding, diverse and complex environments", programmes must be "flexible, customisable and real world enough to meet the needs of this increasingly varied climate." Several other authors, listed in Table 6, call for learners to be exposed to real-world situations.

Table 6 : Papers that call for Learners to Experience Real Situations

Paper	Finding, Argument or Proposition
Myers et al. (2011)	Joint ventures are critical in facilitating some form of cohesion between theory and practice.
Wieringa (2011)	Found usefulness in exposing students to realistic situations.
Hunsinger et al. (2010)	Stressed the need for hands-on experience through professional placements such as internships or job placements.
Bencsik, Noszkay and Marosi (2009)	Found that being exposed to real circumstances and real consequences will result in learners seeing different perspectives, thereby enabling them to approach problems multilaterally.
Land et al. (2009)	Called for joint ventures between academia and industry.
Gill and Bhattacherjee (2009, p. 229)	Highlighted that "sabbaticals in practice" are common in other disciplines such as law, economics and science and these help gain experience and awareness.
Crawford et al. (2006)	Found that exposure to a real-world project environment, rather than overly theoretical approaches, is a vital learning experience for IS graduates.
Chao and Shih (2005)	Use of internships and other experiential learning activities should be a requirement for graduation.
Lynch et al. (2004)	Highlighted that many universities feel that greater levels of responsibility can best be instilled by near real-life educational experiences.
Buhrer (2003)	Argued a lack of scientific theory behind software development and the inability to routinely produce good architecture make the field one in which trial and error are essential.
Gupta and Wachter (1998)	Called for links to industry to enable learners to be exposed to professional behaviour.

Source: Listed in table

In the presence of a lack of globally applicable curriculum, each one of the authors stresses the need for learners to make commitments to certain real-world situations that enable students to feel the elation of success and the disappointment of failure. The disappointment of failure is especially critical: a learner who does not personally experience a negative event may feel a sense of invincibility or magical control over their own ability and their control over external circumstances (Frith-Cozens, 2001). Collins et al. (1990) express a similar sentiment that only when faced with real, non-theoretical, problems will students learn boundary conditions.

Collins et al. (1990) also concur with Dreyfus' (2001) notion that apprenticeship can enhance the learning experience by giving learners access to skilled practitioners and meaningful tasks, thereby forcing them to apply their knowledge. An expressed need for multiple masters is regarded as central to understanding that "even experts have different styles and ways of doing things and different special attributes" (Collins et al., 1990, p. 20). Completion of such meaningful tasks in a variety of contexts with deep consequences, will result in "a rich web of memorable associations" within the learner (Collins et al., 1990, p. 3). After taking ownership it is necessary for the learner to complete tasks that comprise being involved with real circumstances with real consequences.

Cavanaugh (2004) argues that the process of being involved in learning that reflects, the real-world, is as valuable as the end result itself. By allowing dissonance to emerge, the learner will be forced out of their comfort zones and forced to get in touch with their feelings, emotions, anxieties, discomforts and intuitions (Jordi, 2010). The reality of projects allows for commitments and enables learners to "plod along, often in the company of talented peers, searching for a way to learn ourselves out" (Raelin, 2007, p. 500).

In summary, it is clear that the literature calls for learners to be exposed to real situations through the use of joint ventures, internships, and programs that are dynamic and adaptable curriculum. Whilst psychological ownership builds confidence and drive, the exposure to real situations will allow the learner to feel personally, the results of their actions (the elation of success and despair of failure) and get a more accurate sense of their ability or influence. Through all these actions the learner will have faced the "danger and harsh judgement of existence" (Dreyfus, 1999, p.19) through making commitments that help them form an identity.

6.3.3 Reflection

As discussed in the introduction to Chapter 6, reflection enables progression from the aesthetics sphere of existence and involves a learner moving away from being unable to eliminate trivial elements to seeking to develop self-knowledge and an arsenal of experience. The learner must develop the vast repertoire of situational discriminations necessary to develop their own sense of style. There is a need for reflection on one's nature and adjustment as "the unexamined life isn't worth living" (Raelin, 2007, p. 502). This vast repertoire or arsenal necessary to empower the learner can

only be achieved when learners have real experiences. Jordi (2010, p. 184) describes the act of reflection as:

> not within the confines of a small upstairs room well away from the distortions of subjective experience but rather running downstairs, exploring the darkness of the basement, flinging open the front door, and venturing out of the house. If reflection could stretch its limbs, get in touch with its bodily held feelings, its discomforts, emotions, intuitions, and imagination, might then awareness emerge from a more expansive calling.

This implies that reflection follows, or is coupled with, real experience and involves the learner assessing their experience and building a reservoir of past experiences from which to draw confidence. As argued throughout this research, there is a fundamental lack of truth in the IS field resulting in a "best practices", "one best way" or "one fits all attitude" being inappropriate. Learners should therefore guard against anything presented to them as best practice, but rather build the capacity to think critically (Crawford et al., 2006, p. 732). In the absence of ultimate truth, best practice or reality, it is necessary for learners to recognise that any knowledge gained through experience is perspectival and any view of reality cannot exist independently of their view (Raelin, 2007). Entwistle and Peterson (2004, p. 412) argue that "students try to interpret what is required of them in a particular situation on the basis of past events." One could argue that in addition to real experience, a need for reflection is central to development to avoid learners becoming "transfixed to any one world view" (Raelin, 2007, p. 504).

This reflective initiative could be in personal development or even something as simple as the perfection of simple tasks. Schön (1983) discusses this characteristic in professional athletes. Baseball players talk about "being in a groove" or "finding a groove" and describe it as their peak level of performance on a particular night. Schön describes this as a type of reflection that involves adjusting one's approach based on circumstance, rather than assuming that one approach will always work. Wieringa (2011, p. 172) explicitly concurs, describing reflection as the act of identifying one's habits and "appreciating some and discarding others." Candy (1991, p167) describes this type of reflection as an "internal and invisible process, not susceptible to direct observation." Another example can be found in Michael Schumacher. His rivals often commented that he had an innate ability to understand the limit of the car in different situations – those situations being differing weather conditions and differing race tracks. It is an ability that he himself could not fully describe but he recognised that there were limits and rules he could meet in terms of health, well-being, and the physical limits of his cars.

He recognised that it was his responsibility to find those limits not only through constant analysis, experimentation and experience, but also an awareness of past circumstances from which to draw gained experience.

As demonstrated in Chapter 2, the IS practitioner must facilitate the harmonious symbiotic relationship between an IT Artefact and its "messy and ill-defined" (Kroeze et al., 2011) social context. Doing this without authoritarian guidance from an industry regulator, results in the necessity to constantly evaluate, reflect, adapt and independently investigate the truth of the most appropriate response to a situation. Part of this process involves appreciation of the value of exploration, investigation, collaboration which results in their performance being challenged, mistakes being made and opportunities from improvement encouraged (Lynch et al., 2004, p. 434; Stewart et al., 2010). With the presence of unpredictable circumstances, students could reflect in their action, reframe, and work against established precedence to arrive at a solution to a pressing problem (Schön, 1983). The learners will seek a way to learn themselves out of difficult situations (Raelin, 2007). In addition the learners must note the importance of being exposed to more than one perspective, thereby having the "bold intellectual reach rather than a tight disciplinary grasp" that King and Lyytinen (2003, p. 143) stressed was necessary for the field. With credentials alone being established as inadequate, in learning this skill, the skill of reflection, the learner will follow a non-linear (Aspin & Chapman, 2012) path towards competence. It is therefore an essential requirement for educators to guard against a focus on an instrumentalist approach to training students (Kumar, 2006), but rather to encourage active involvement and participation to equip them with the ability to learn new skills as they evolve (Janicki et al., 2008). In summary, it is evident that reflection is not an activity that can be performed in isolation. Section 6.3.2 showed that in experiencing real situations with real consequences, the learner will feel the "elation of successes" and the "despair of failure" which will help their development. In addition it was argued that learners must constantly assess their experiences and relate them to each other, thereby creating the "vast repertoire" of experiences necessary to develop their own style and thereby progress through to the religious sphere of existence.

6.4 Summary

Existentialism has been proposed as a possible characteristic that can be instilled in learners that can help them to contend with the nature of the field. The generic nature of existentialism leads to the research inducing three existential categories (Psychological Ownership, being in touch with Reality,

and Reflection) from literature that serve as fundamental elements in building a theoretical framework. One could argue, as demonstrated in Figure 7, that there is a cyclical relationship between Psychological Ownership, Reality and Reflection. As discussed in section 6.2.1 and section 6.2.2 learners are traditionally socialised as empty vessels or metaphorical jugs passively waiting to be filled with knowledge. Raelin (2007) argues that it would be difficult to move learners out of this space without provocation. Through the discussion it became evident that learners who take Psychological Ownership could serve as provocation. Some authors argue that this Psychological Ownership can be "instilled by" having real projects and real consequences (Candy, 1991; Druskat & Pescosolido, 2002; Reffell & Whitworth, 2002; Raelin, 2007) allowing learners to feel the elation of success and the disappointment of failure while facing and confronting the danger and harsh judgement of existence central to Kierkegaard's religious sphere of existence. In addition, as discussed in section 6.3.2, having Psychological Ownership of one's development can lead to learners gaining a desire to seek, or "create desire for" real circumstances and consequences, thereby forcing the learner out of their comfort zones and searching for situations from which to learn themselves out (Raelin, 2007; Jordi, 2010).

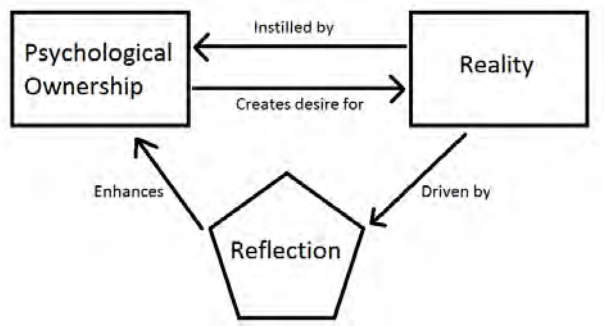

Figure 7 : The Relationship between categories: Own, Do, Reflect

Source: Researcher's construct informed by Gardiner (1988), Candy (1991), Dreyfus (1999), Dreyfus (2001), Druskat and Pescosolido (2002), Reffell and Whitworth (2002), Raelin (2007), Jordi (2010).

In addition to the relationship between Psychological Ownership and Reality, by having had real experiences, the learner would have been emotionally involved in the task and would therefore have felt the elation of success as well as the disappointment of failure. The result of such interactions and emotions would lead to the learner having the reservoir, or arsenal, of past experiences necessary to help them grow into Kierkegaard's religious sphere of existence. One could conclude that the act of Reflection is "driven by" the learner having had real experiences (Jordi, 2010). In addition, it was argued that the act of Reflection can "enhance" Psychological Ownership by allowing the learner to critically reflect on the different experiences they may have had and avoid being transfixed on a particular perspective or view (Raelin, 2007). Having experiences results in material to reflect on,

which then enhances the learner's Psychological Ownership and creates more desire for real experiences.

In practical terms, the theory induced in this chapter can be understood by examining Figure 8: a graphical representation of the process a learner may face, doing multiple projects, in an existential journey through an academic institution. As highlighted by Raelin (2007), learners would need some 'provocation' to move out of their comfort zones. The university could 'provoke' learners by making them choose and commit to a real social context, IT Artefact and an area of specialisation. Such provocation could be a project or special endeavour. Once this provocation has taken place the learner would then have the responsibility of taking ownership of making choices and prioritising factors in real circumstances and real situations. Through making choices, the learner will confront danger and the harsh judgement of reality. Upon completion of the task, the learner could reflect on their experience and adjust their approach for their next commitment. In Figure 8, the learner works through three different social contexts with different IT Artefacts, each time prioritising different factors. After completion of a few projects, a learner has repeated the cycle (of taking ownership, doing something real and reflecting) and thereby moved away from a transfixed perspective, forming an identity based on personally relevant priorities. This will result in identity formation and allow the learner to prioritise some elements, while discarding others and charting a path towards competence.

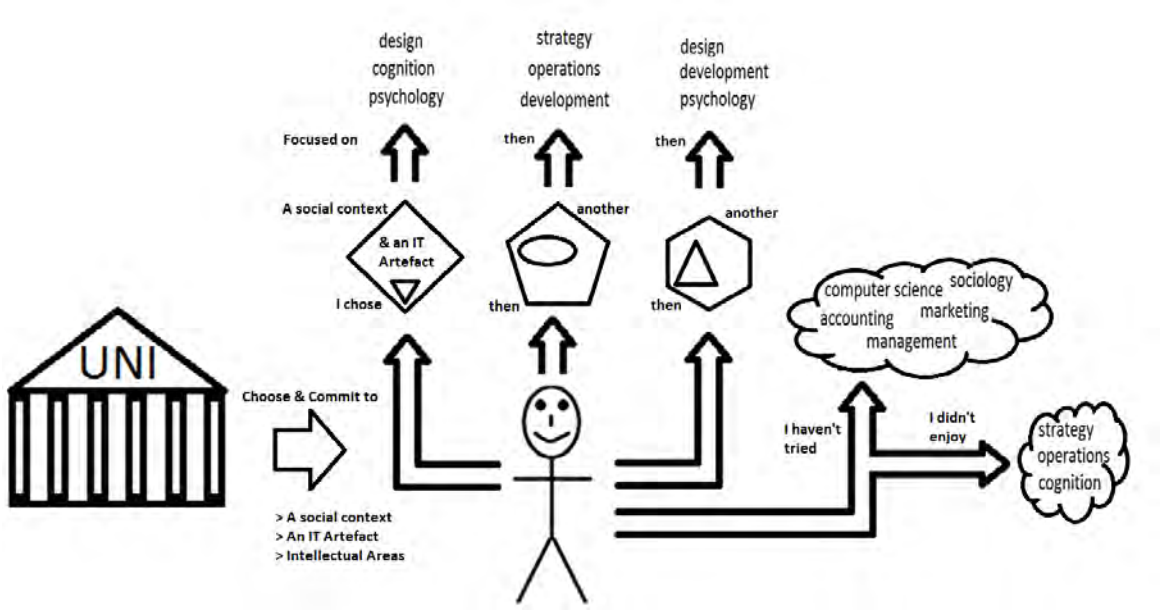

Figure 8 : Academic Institutions provoking learners to: Own, Do, Reflect

Source: Researcher's construct informed by Gardiner (1988), Candy (1991), Dreyfus (1999), Dreyfus (2001), Druskat and Pescosolido (2002), Reffell and Whitworth (2002), Raelin (2007), Jordi (2010).

7. Research Design

In previous chapters of this research, the ill-defined and ever changing nature of the IS field was established. It was argued that academic institutions applied curriculum inconsistently and that mere credentials were insufficient in preparing a student for the vast and evolving needs of industry. In place of credentials, the characteristic of existentialism and a willingness and ability to independently investigate the standards, priorities and ideologies of different environments were presented as a possible key attribute of IS learners. In addition, Kierkegaard's three spheres of existence and Dreyfus' seven stages of adult learning were used as a theoretical lens to describe the path of an IS learner. Through examining literature a theoretical framework was developed; three categories of existential behaviour, namely Psychological Ownership, being in touch with Reality, and Reflection, were identified as key categories that can be instilled in learners.

7.1 Research Purpose, Objectives and Questions

7.1.1 Purpose

Due to the diverse perspectives in the IS field and the gap between academia and industry, the purpose of this research is to examine the experiences of Alumni and their journey from undergraduate students to practitioners in industry. In doing so, interventions that helped them in their development can be identified which could lead to further insight into how students can be equipped to contend with the challenges of the field.

7.1.2 Objective

In conducting the literature survey, existential effort and independent investigation of the truth through Psychological Ownership, being in touch with Reality and Reflecting, were argued to be relevant categories of existential interventions that need to be instilled in IS learners. Through combining these elements a theoretical framework was induced. The objective of this research is to test this framework and, through accounts of graduates and Graduate Recruitment Officers, gain insight into how best to equip learners to perform well in academia and then make a smooth transition to industry. These samples were chosen with the intention of examining first-hand accounts from graduates, and their experiences of competence development, as well as the perceptions from observers, the Graduate Recruitment Officers, who would observe that development.

7.1.3 Questions

The research will be both descriptive and exploratory. It is descriptive as it is focused on describing the path of development of the students. In attempting to investigate the development path of students, the following research question could be asked:

1. What do graduates recall as the factors, interventions, experiences and preparation that have contributed to their development?

In seeking to answer this research question, the researcher aims to gain reflective accounts on the development path of a sample of graduates and in so doing analyse and potentially identify common trends. It is expected that the findings of the theoretical framework will be confirmed with interventions that encouraged Psychological Ownership, being in touch with Reality and Reflection, expressed as crucial interventions. This is useful as "research to examine and understand how IS competencies and capability can be developed and sustained will provide a real source of value to organizations" (Peppard & Ward, 2004, p. 9). The researcher also aims to gain reflective accounts of Graduate Recruitment Officers and their perceptions and experiences of graduates' adaptation to industry. For the purposes of this research, a Graduate Recruitment Officer could be defined as one who is responsible for hiring fresh graduates from academic institutions.

The research is also exploratory in that it seeks to explore the role of the academic environment in competence development and to identify which factors and interventions practitioners recall as most significant in their development. Factors that helped instil the existential characteristics in learners, and assisted those most on their path towards competent practitioners. In attempting to explore the role of the academic environment the following research question could be asked:

2. Is there a relationship between academic preparation and subsequent career trajectory?

As part of gathering reflective accounts from participants, the study will seek to explicitly initiate discussion surrounding the role and effect of which the academic environment had on the development of practitioners. The perspectives of Graduate Recruitment Officers will also provide an alternative perspective in assessing readiness for industry.

In addition to exploring the role of the academic environment in competence development, the study will also explore the role and effect of teamwork on competency development. A third research question could be asked:

3. Is there a relationship between group experiences and career trajectory?

As suggested by Figure 8, academic instructions could expose learners to form teams, work on different projects, making them choose specialisations, thereby resulting in their making of identity-forming commitments. As discussed in Chapter 5, the IS field is characterised by a vast intellectual scope; there exists an imbalance of priorities and focus on different factors. It was shown that differing universities and regions would have differing priorities, thereby causing learners to be moulded differently. It was argued that this may result in choosing a role or specialisation, which comprises a naïve uninformed decision. Research question one is focused on assessing the usefulness of existential interventions in an individual's development. However, the researcher feels the need to examine the effect of group experiences and group projects, thereby assessing one's peers' influence on an individual's growth and career trajectory. As shown by Cappel (2001, p. 1934), teamwork was considered the second most important attribute in IS competency. It is expected that for many, the first group experience would shape their priorities and which focus and act as a metaphorical fork in their path, sending them down to a particular role or area of focus.

7.2 Research Paradigm

As discussed in the research questions, a theoretical framework was induced from literature. This was done with the aim of gaining an understanding and possibly explaining methods in which IS practitioners ascended to their current levels of competence with a specific focus on the role and effect of the academic institution and the role and effect of team (or group) work. Positivistic research holds the view that within the world, there exists an objective truth or best practice waiting to be discovered by a researcher. Orlikowski and Baroudi (1991, p. 9) describe research as positivistic when researchers "assume an objective physical and social world that exists independently of humans, and whose nature can be relatively unproblematically apprehended, characterised, and measured." This means that a fixed reality exists that the researcher seeks to uncover.

In contrast, Orlikowski and Baroudi (1991, p. 13) describe an interpretive philosophy as one in which reality as well as knowledge are "social products and hence incapable of being understood independently of the social actors (including the researchers) that construct and make sense of reality." This means that any findings or knowledge is perspectival and that any theories of reality or truth are "organically embedded in our culture and hence conditioned by our point of view", therefore subjectivity is acknowledged as "we can't compare our views of the world to the world as if it exists

independently of our views" (Raelin, 2007, p. 497). The research therefore starts from Walsham's (2006, p. 320) notion and understanding that:

> Knowledge of reality, including the domain of human action, is a social construction by human actors. Our theories concerning reality are ways of making sense of the world, and shared meanings are a form of inter-subjectivity rather than objectivity.

Inter-subjectivity called for subjective and inductive interpretation whilst inducing the theoretical framework from the literature survey. In this endeavour it was discovered and highlighted that the generic nature of curriculum and the inconsistent application thereof by differing universities or regions, caused a lack of ultimate truth or best practices surrounding the phenomenon of IS competency development. Learners, based on their institution or region, would be exposed to differing philosophies and perspectives about the nature and focus of the field. Conducting this research therefore required subjective interpretation of alumni accounts and experiences that represent a subset of the multitude of possible accounts or experiences that exist in the IS field. This lack of truth and need for subjectivity resulted in an interpretive research philosophy to be chosen. In conducting research of this nature, there is a recognition that the researchers' "prejudice is a necessary starting point of our understanding" (Klein & Myers, 1999, p. 77). Klein and Myers (1999, p. 67) argue that an interpretive research philosophy has the potential to "produce deep insights into Information Systems phenomena."

7.3 Target, Sample Space, Ethical Considerations and Time Frame

The interpretive philosophy is often associated with case study research. Interpretive philosophy is described as a philosophy which values analysis of unique circumstances and is highly suspicious of any claim that studies of human behaviour can be culturally independent (Klein & Myers, 1999, p. 75). Interpretive IS research argues that relationships between people, organisations and technology are not fixed, and socially constructed reality is a moving target. Therefore each instance of interpretive research can be treated as a "unique historical occurrence" (Klein & Myers, 1999, p. 73). In conducting this research and trying to understand the path of IS competency development, the role and effect of the academic environment and the role and effect of team work on that path become troublesome. An element of complexity was created by the presence of generic curriculum and the inconsistent and vastly differing application and prioritisation by different academic institutions. Therefore this research could be considered a "unique historical occurrence" as it is a case study limited to the accounts of and experiences of graduates from the University of Cape Town and Graduate

Recruitment Officers. It examines graduates who completed third year and honours level IS courses at the University. For ethical reasons the calibre (i.e. factors such as the historical academic performance, role in industry or perceived success) of participants was not screened and no willing interviewees were excluded from the sample. All ethical clearance procedures were followed and approved by the Faculty of Commerce at the University of Cape Town on two occasions during the research.

A central part of the third and fourth-year curriculum involves learners completing a system development project. The project involves learners self-forming a group of 4 or 5 team members, finding and choosing a business problem from a sponsor in industry, and going through all stages of the Software Development Life Cycle (SDLC). For many of the learners this project experience is a long-term group experience with a real business problem, as opposed to a theoretical written case study. It also examines the accounts of Graduate Recruitment Officers who have over two years' experience in hiring graduates from the University of Cape Town. Although this study encompasses 5 years of graduates, the data collection was conducted in 2012 and in 2014. It sought to gain insight from practitioners with differing levels of experiences and exposure to industry, as well as from those Graduate Recruitment Officers responsible for hiring them. Therefore the study can be thought of as cross-sectional as opposed to longitudinal.

7.4 Research Strategy, Data Gathering and Research Instruments

It is generally accepted that the two main research methods are quantitative and qualitative methods of data collection. Quantitative methods are traditionally not used for social studies as they involve data with controlled variables and relationships (Myers & Avison, 2002). In contrast, the origins of qualitative research can be traced back to the social sciences (Myers, 1997) as the intention was to enable researchers to study social and cultural phenomena. As this research is focused on the study of competency development of IS practitioners, a qualitative methodology was employed. A qualitative research methodology is one which involves the study of participants in their natural settings and helps researchers understand participants and the environment in which they operate (Kaplan & Maxwell, 2005; Myers, 1997).

In qualitative research, the use of open-ended interviews are common and are intended to draw out accounts of the interviewee's experiences and perspective. Data cannot be quantified as it is in the form of words rather than numbers (Kaplan & Maxwell, 2005). As a consequence of this, qualitative research typically involves interpretation of open-ended interviews, questionnaires, documents, texts and accounts for the researcher's perspectives (Myers, 1997). The data sample and instruments were therefore designed as semi-structured interviews that enabled the researcher to draw out and interpret reflective accounts of graduates as well as Graduate Recruitment Officers. Each of these samples and their respective research instruments are now discussed.

7.4.1 Alumni Accounts

In order to gather reflective accounts of students, the primary method of data gathering was individual, audio recorded, semi-structured interviews. Table 7 summarises and explains the purpose of each of the questions in the semi-structured interviews (also attached as Appendix A). Responses were organised in Microsoft Excel, coded by their relevance to research questions as well as the elements of the theoretical framework induced from literature. The interview was designed as a reflective exercise in which graduates give accounts of their experience in growing from novice learners to competent practitioners in industry. The interview was developed through a cyclical process of discussion with academic staff and class mates of the researcher. This research instrument for this sample was designed to help answer all three research questions.

Table 7 : Research Instrument for Graduates/Alumni

Number	Question	Explanation
1	When did you start working?	Categorisation of participants
2	When did you do your third year at UCT?	
3	Which areas (if any) were you competent in before that year?	Section 3.3 argued that the field is one of vast intellectual priorities. Section 5.2 argued that this vastness may lead to difficulty in a learner choosing a role. These three questions are intended to help assess changes in roles and focus as a result of the third year project.
4	Which areas did you prioritise for your development?	
5	What made you choose to focus on those areas?	
6	Can you share 2 – 3 experiences at least of the 3rd year that have shaped and influenced your career and development? These experiences could be social as well.	For many participants the third year project will be the first real, non-theoretical case study, project experience. Learners are given the freedom to choose a project and teammates. These questions are designed to help draw out the effect of autonomy and non-theoretical activities on the learner, thereby assessing the value of the elements of psychological ownership and being in touch central to the theoretical framework induced from the literature.
7	Is there a trajectory (route) of development that the third-year project launched you into?	
8	Do you feel the foundation given to you by your third year was adequate enough for you to start in	This question will help assess the learner's perception of their readiness for industry as well as their adaptation after University.

	industry? Also please describe your development after you left UCT.	
9	Can you identify a specific experience or event that has aided your development significantly?	As discussed in section 6.3.3, reflection often follows a real experience. These four questions ask the participant to reflect on their biggest responsibility. This should provide insight into the effects of serious situations with real consequences. They will also enable the researcher to assess the degree of growth from these responsibilities.
10	In the history of your career, what was the biggest responsibility given to you?	
11	How do you think you performed?	
12	What did you take away from that responsibility?	
13	In the area in which you are specialising, how would you describe your competence? Can you motivate your answer?	These four questions ask the participant to reflect on their own competence and ability as well as their reliance on methodologies and tools. This will help provide insight into the participant's adaptability in different circumstances.
14	In the history of your development what are your most valued tools, concepts or methodologies?	
15	What are your most valued tools, concepts and methodologies at the moment? Those practiced most frequently.	
16	How reliant are you on the items mentioned above?	
17	Do you recall an event during your development where you failed to meet the requirements for a task?	Similarly to questions 9-12, these two questions also seek to provide insight into the effects of real consequences. However, in asking the participant to reflect on failure, these questions will allow the researcher to assess the degree of responsibility, or ownership, taken for failure.
18	If the task were to present itself again, would you attempt it again? If not, why? If so, what would you do differently to ensure success?	
19	Do you feel being asked to reflect on past experiences and or events helps in your development?	This question will provide insight into the participant's perceived value of reflection.
General	General comments are included to allow the participant freedom to add or question anything.	

As highlighted in section 7.1 the research is a case study aimed at assessing competency development of IS students, the role or effect of the academic environment in this process, as well as the effects of teamwork in choosing a specialisation. Therefore, participation was limited to those Alumni who had completed either third (for many the first group experience) or fourth year of study in Information Systems at the University of Cape Town.

Of the Alumni who satisfied the criteria and were approached, a total of 44 consented to participate in the research. Figure 9 shows the breakdown of graduates per year, whilst Figure 10 shows the breakdown of the roles of participants. The miscellaneous category comprised of individuals who identified themselves uniquely (e.g. 'Brand Ambassador,' 'Systems Integration,' 'Document Analyst' and 'Entrepreneur').

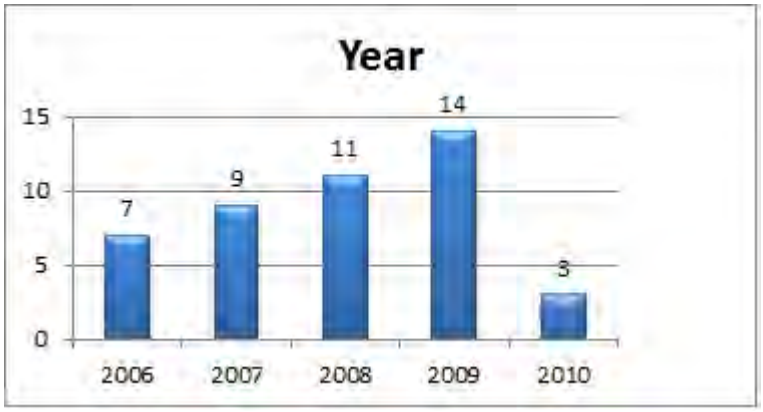

Figure 9 : Participants per year

Source: Researchers analysis of data

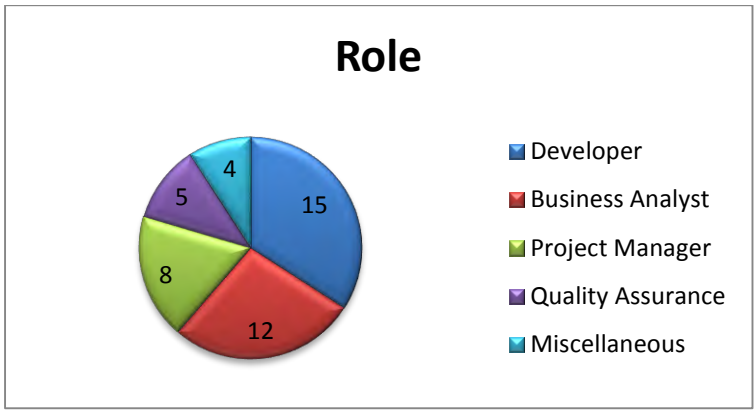

Figure 10 : Participants per Roles

Source: Researchers analysis of data

Of this sample, 10 participants completed the interview by e-mail and 34 participated in face-to-face interviews. In addition to having completed third and fourth year IS courses, 9 of the participants had an additional year's experience in the form of tutoring third year level courses while completing their fourth year. Figure 11 is an example of the unique number given to each of the participants. The number comprised of 4 parts. Part 1 indicated the role the participants categorised themselves with. Table 8 contains a list of acronyms that were used to describe roles. Part 2 indicated the year in which the participant completed their third-year project, part 3 indicated the initials of the participant, and part 4 indicated an experience level. In addition, each relevant response was allocated an identity number. Relevant responses were numbered, are listed in appendix C and categorised by relevance to each research question. The response identity number was the primary method of identification in presentation of the findings.

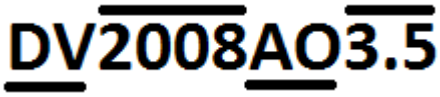

Figure 11 : Participant Unique Identifier

Table 8 : Role Identifying Acronyms

Acronym	Role
DV	Developer
BA	Business Analyst
PM	Project Manager
QA	Quality Assurance
MSC	Miscellaneous

7.4.2 Graduate Recruitment Officer Accounts

The second entity comprised of Graduate Recruitment Officers who were responsible for recruiting final year students and placing them in jobs within their companies. The Graduate Recruitment Officers were asked to fill out a questionnaire via e-mail, and provide their reflective accounts on their experiences in hiring graduates. Responses were organised in Microsoft Excel, coded by their relevance to the research questions as well as the elements of the theoretical framework induced from literature. This provided another perspective, an engaging observer's perspective on graduate readiness and adaptation to industry. In total six Graduate Recruitment Officers completed the questionnaire. Table 9 identifies each question included in the questionnaire, (also shown in Appendix B) and gives an explanation of the purpose of each question. This research instrument and this sample were designed to help provide additional insight into research question one and two.

Table 9 : Research Instrument for Graduate Recruitment Officers

Number	Question	Explanation
1	What incentives/interventions do you give your fresh graduates to embrace the organisational culture?	These questions are aimed at drawing out the effect of interventions that helped instil a sense of ownership/ belonging in the graduates thereby assessing the value of psychological ownership of tasks.
2	Do you offer any ownership of work or offer equity?	
	a. If yes - does this help with motivation?	
	b. If no- why not?	
3	Can you briefly contrast the mindset of a final year university student to what you expect/want from your fresh graduate? What are/have been the issues/stumbling blocks in moving students between those two mindsets?	This is intended at assessing the readiness of graduates as well as the difficulty in moving graduates between environments thereby assessing the effect of reality.
4	Do you observe an increased sense of pride and commitment after the graduate has completed their first few tasks?	These questions seek to draw out not only indications about readiness for industry, but also graduates' reactions or growth from real situations with real circumstances.
5	In the initial phases of the program, are students timid/hesitant in their first interaction with clients? E.g. would they prefer to deal with internal projects rather? Do	

	they want to follow more senior staff? Do they want to be "thrown into the deep end?"	
	a. How would you deal with any timidity/hesitation?	
	b. If no, how often has this confidence translated into success?	
6	After completion of interactions with clients, do you observe an increased sense of confidence in graduates?	
7	Is there any 'free time' allocated? Time where graduates can work on their own projects and thereby bring new ideas/insight into the company?	This question is intended to provide insight into the effects of psychological ownership over work.
	a. If yes, are graduates more excited about this time?	
	b. Have these initiatives produced useful outcomes?	
8	After having completed your recruitment drive, do you assume the students will fit into your company or do you have moulding procedures in place?	This question deals with readiness for industry.
9	What level of mentorship do you provide your graduates? Do graduates get allocated mentors or do you allocate mentors retrospectively when expectations are not met?	These questions deal with reflection and its effectiveness in the workplace.
10	What feedback mechanisms are in place? Is this feedback just a formality or does it result in changes in behaviour?	

Key responses were interpreted and a summary of responses can be found in Table 20, appendix D. As shown in Figure 12, responses were numbered with the first part of the number indicating the question that was asked, and the second part of the number indicating the company that gave the response.

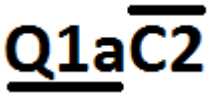

Figure 12 : Numbering of Graduate Recruitment Officer Responses

7.5 Data Analysis

After the interviews were conducted, the audio files were personally transcribed and proof read by the researcher in order to allow for deeper understanding and reflection on the accounts of the Alumni. This process helped the researcher feel secure and confident about the quality of transcription. The following sections describe the data analysis from the respective data sources. In

participating in the interviews and questionnaires, the respondents described the history of their choices, experiences, methodologies and events that shaped development. In analysing the data generated from the interviews, the researcher used both forms of data analysis: deductive and inductive. A thematic analysis was conducted as the data was qualitative and an interpretive philosophy was used.

7.5.1 Deductive Analysis for Research Question One

Research question one is focused on what graduates "recall as the factors, interventions, experiences and preparation that have contributed to their development." Hyde (2000, p. 83) explains that "deductive reasoning is a theory testing process which commences with an established theory or generalisation, and seeks to see if the theory applies to specific instances." Research question one aims to be deductive as it aims to test the theoretical framework that was induced from the literature survey and presented in Chapter 6. Successful confirmation of the theory would involve graduates expressing existential initiative and independent investigation, such as Psychological Ownership, being in touch with Reality, and Reflection, as being central tools in their development. To identify these "responses", the transcriptions were read and numbered. Statements, or responses, where categorised, in Microsoft Excel, into statements supporting Psychological Ownership, Reality and Reflection. Table 10 summarises each category of existential intervention and the criteria that would lead the researcher to classify the response as relevant to that criteria.

Table 10 : Categorisation of Responses

Category	Criteria	Expected Key Words
Psychological Ownership (PO)	Responses that showed learners taking responsibility, initiative and control over their learning	➢ "Self" ➢ "Improve" ➢ "Investigate" ➢ "Jump in"
Reality (R)	Responses that showed learners valuing real circumstances, responsibility and consequences for their actions	➢ "Deep end" ➢ "Thrown out" ➢ "Scary task" ➢ "Real world"
Reflection (RE)	Responses that showed learners reflecting on past actions and adjusting their approaches	➢ "Adjusted" ➢ "Retrospective" ➢ "Re-try" ➢ "Feedback"

Source: Researchers analysis of data

There were instances where a statement, or response, described more than one category; these responses were included in all relevant categories. After the responses were categorised, they were sorted into separate Tables. These Tables are listed in Appendix C. Table 13 shows responses for Psychological ownership, Table 14 shows responses for Reality, and Table 15 shows responses for Reflection. In addition there were instances where the responses of Graduate Recruitment Officers supported notions that where established in the theoretical framework. These are captured and summarised in Table 20 in Appendix D.

7.5.2 Inductive Analysis for Research Questions Two and Three

Hyde (2000, p. 83) explains that "inductive reasoning is a theory building process, starting with observations of specific instances, and seeking to establish generalizations about the phenomenon under investigation." Whilst the theoretical framework about the importance of existential effort and the specific academic interventions that instilled these characteristics was established and was tested in research question one, an exploratory approach can be taken into assessing the role of the academic environment (research question two) and effect of teamwork (research question three). Results of this exploratory approach were induced from responses by participants. Responses from the participants allowed the researcher to identify and categorise common trends and themes (listed in Appendix C, Tables 16 to 19, and Appendix D, Table 20) that provided insight into to the role of academic preparation and teamwork in practitioner development. A brief overview and summary of each of the themes, categorised in Tables, are now discussed.

Relevant to Research Question Two:

- Appendix C, Table 16 – An indication that real project experience was the most crucial experience.
    - Responses were drawn from Alumni's answers to questions 6, 7 and 8 of the interview. Responses that were included in this category were those where the respondents indicated that they valued real experiences, pressure under difficult circumstances or the presence of real consequences.
- Appendix C, Table 17 – A lack of readiness for industry and encouragement for an honours year
    - Responses were drawn from Alumni's answers to question 8. Responses that were included in this category were those where the respondents explicitly responded to

the question of readiness for industry. There were instances where respondents advocated for an honours year; this was captured and indicated on the Table.

Relevant to Research Question Three:

- Appendix C, Table 18 – Evidence of role switching
    - Respondents were asked, in questions 3, 4 and 5 about their specialisations, or areas of interest before during and after their third-year project. The responses of all 44 respondents were captured and listed. This allowed the researcher to analyse role changes.
- Appendix C, Table 19 – Evidence that team experiences were vital in development
    - Responses were drawn from Alumni's answers to questions 5 through to 9. Responses that were included in this category were those where the respondents explicitly indicated that they valued team experiences.

Relevant to Research Questions Two and Three:

- Appendix D, Table 20 – Summary of Graduate Recruitment Officer responses
    - As the sample of Graduate Recruitment Officers was much smaller, 6 as opposed to 44, a more granular approach was taken. A matrix that listed each of the questions and to each of the respondent's answers, was created. The matrix contained only the key elements of the response allowing for easy comparison and analysis of results.

7.6 Summary

This chapter introduced the purpose and focus of the research. It also showed the philosophies, methodologies and approaches that the research followed. In summary, the theoretical framework induced from literature, and presented in Chapter 6, identified existential attitudes that could be instilled in learners to help prepare them for the nature of the field.

The research is focused on further enhancing this theoretical framework by taking both an exploratory and a descriptive approach. The research was exploratory, as it seeks to explore the role of academic institutions and teamwork in competence development. This was achieved by inducing conclusions from trends and themes identified from responses. The research is also descriptive as it seeks to

identify the specific methods that are appropriate for preparing IS students for industry. This was done by deductively analysing responses against the theoretical framework developed from the literature.

The research is limited to a case study of graduates from UCT and of accounts of Graduate Recruitment Officers who hired graduates from UCT. As there is a vast range of conflicting approaches and ideologies in the field, as discussed in Chapters 3, 4 and 5, the interpretive research philosophy was chosen. The data that was gathered and interpreted was qualitative: it was comprised of semi-structured interviews and questionnaires. Although the sample comprised 5 years of graduates, it can be thought of as a cross-sectional study as all the graduates were asked to reflect on past experiences in 2012 and 2014.

8. Analysis and Findings

As discussed in the literature review, there is a lack of IS truth and an ever present gap between industry needs and academic output. This research is focused on assessing how learners in academic institutions can best be prepared for the IS field. Chapter 6 introduced a theoretical framework that emphasised existentialism and argued that existential interventions, such as Psychological Ownership, being in touch with Reality, and Reflection could be useful in preparing learners for industry. Chapter 7 then introduced the research design, identified three research questions and presented the research samples, methodology and instruments. The findings of each research question are discussed in this chapter.

8.1 Research Question One

Research question one is focused on what graduates recalled as the factors, interventions, experiences and preparation that have contributed to their development. The intention of this research question was to assess the theory of whether the cyclical existential interventions of Psychological Ownership, being in touch with Reality, and Reflection were key elements in developing learners. An interpretive, deductive approach was taken in assessing this. Through semi-structured interviews, reflective accounts were drawn from graduates and Graduate Recruitment Officers. The results for each of the existential characteristics are presented in this section.

8.1.1 Findings on the Characteristics of Psychological Ownership

As discussed in section 6.3.1 (page 56), the characteristic of Psychological Ownership was defined as a learner taking initiative for their own development and seeking to apply knowledge to personally relevant problems. The literature presented, argued that methods such as intentional ambiguity, increased autonomy and removal of metaphorical scaffoldings could result in the learner taking responsibility, initiative and building their confidence on a self-motivated and self-driven journey towards competence. As Table 10 identified in section 7.5.1 (page 76), the responses which indicated that Psychological Ownership was necessary, could be identified as those where learners showed they took responsibility, initiative and control over their learning.

The key words identified were 'Self,' 'Improve,' 'Investigate' and 'Jump In.' Of the 44 alumni respondents, 32 (72.73%), made 44 statements (see Table 13 in appendix C, page 121) that highlighted

Psychological Ownership as a necessary characteristic in their development. As shown in Figure 13, the majority of these statements were drawn from questions 6, 8 and 9. As discussed in Table 10, Question 6 was intended to draw out accounts of the effect of the third year-project which, for many, was the first project instance which was learner centred. Question 8 was intended to draw out accounts of the foundation given by the University, and competence development after completion of studies, while question 9 asked the participant to discuss their biggest responsibility. In addition, accounts from Graduate Recruitment Officers were collected (listed in Appendix D, page 154). As discussed in Table 11 (section 7.5.2, page 77), questions 1, 2 and 7 of the graduate recruitment research instrument were intended to assess the effects of ownership of work on performance. Of the 6 companies approached, all offered ownership of work to employees (four formally) and indicated that this helped with motivation. Two companies went further and indicated that work done in free time and driven by an employee initiative, resulted in *useful application* (response Q7bC2) as the work would *go into production* (response Q7bC1).

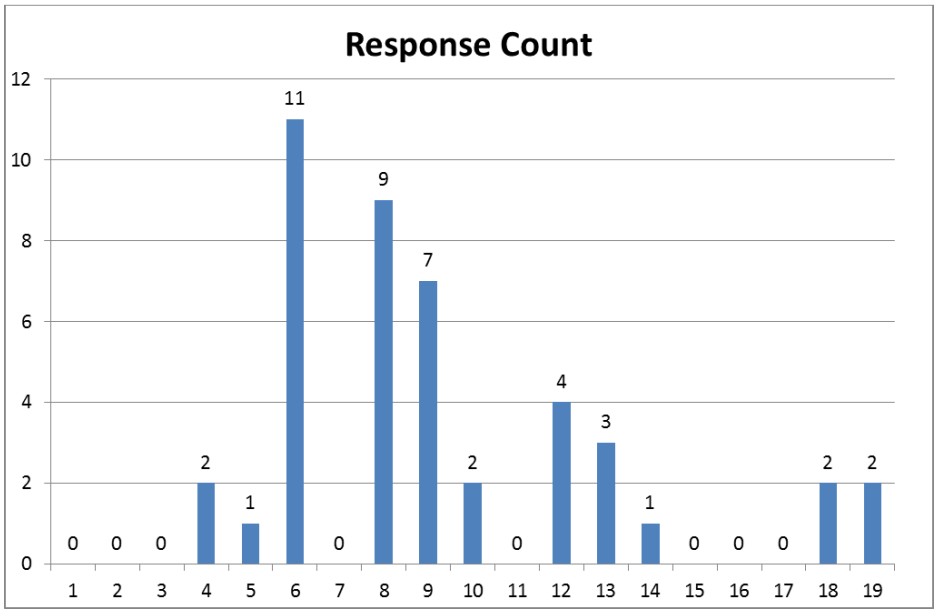

Figure 13 : Responses per Question - Psychological Ownership

The most explicit indication of a link between Psychological Ownership and effective learning can be found in response 72 where the respondent described a responsibility as *sort of my baby* and indicated that she had *learned a lot through that*. Echoing this sentiment, one respondent stated that being given responsibility made him feel important and that lead to his willingness to put in extra effort (response 102).

The responses indicated that *self-learning is a core value* (response 116) necessary for development of competence. This concurs with Jordi's (2010, p. 194) sentiment that learning should be *intentional*

and attempt at *stretching* one's experiences forward. A learner needs to *have that personality trait, that characteristic of being willing to also work on things and investigate and work things out* (response 34). Many respondents highlighted their third-year project as a defining moment as it was the first instance where the project was *owned by the student* (response 81). Some described this as a *great experience* as they were creating something for themselves (response 43). Having the reduced facilitation that Froehlich et al. (2014) identified as crucial to deep learning, led to learners having to *mostly self-teach* themselves (response 70) through a *huge learning curve*. This sentiment carried through to industry where the need to learn to *manage one's self* was emphasised (response 5). One student remarked that *if we had not gone out and taught ourselves what we had needed for our project, we would not have been in any way qualified to start in industry* (response 134). As expressed by Druskat and Pescosolido's (2002), reduced supervision as well as *varying levels of flexibility and freedom* (Lynch et al., 2004, p. 440) combined in the unstructured nature of the project meant that learners had to unleash the *power of unstructured and creative thinking and that there isn't a written solution* (response 89) which required their having to *work things out* and *fend* for themselves (response 123), moving beyond the metaphorical *scaffolding* identified in section 6.3.1 (page 56). Part of this experience involves deciding on which area to focus on and many argued that *people function better when they are working on their passions as opposed to just being made to work on things that they are seen as good at* (response 3). A student concurred with this sentiment very strongly. His passion for cycling, allowed him to create and own a cycling website. He regarded this as a key experience in his development (response 27). The evidence from the Graduate Recruitment Officer accounts concurs with the perspective that having *autonomy and freedom to manage one's own work* (response Q2C2) results in people becoming more excited to work on their own material (response Q7aC4). One respondent argued it was part of *human nature* (response Q7aC2) to be more excited about one's own ideas.

8.1.2 Findings on the Need for Reality

As discussed in section 6.3.2 (page 59), a fundamental part of development involves learners consciously and deliberately integrating learning with real-life situations (Van der Merwe et al., 2010). There was an abundance of literature, as presented in Table 6, in section 6.3.2 (page 59), which supported the need for joint ventures between industry and academia and for the benefit derived from exposing learners to near real-life situations.

As Table 10 identified in section 7.6.1 (page 76), responses that indicated the need for reality as useful in competence development were those where learners expressed that they valued real circumstances, responsibility and consequences for their actions. Some possible key words identified were 'Deep end,' 'Thrown out,' 'Scary task' and 'Real world.' Of the 44 alumni respondents, 31 (70.45%), made statements (see Table 14 in appendix C, page 121) that highlighted being in touch with reality, or completing real tasks as a necessary intervention in their development. As shown in Figure 14, the majority of these statements were drawn from questions 6, 8, 9 and 12. An additional 3 responses were draw from the general section of the interview.

Question 6 was intended to draw out accounts of the effect of the third-year project which, for many students, was the first project instance which was learner centred. As discussed in section 7.3 (page 69), the project involved learners self-forming a group, finding and choosing a business problem from a sponsor in industry, and going through all the stages of the SDLC. Question 8 was intended to draw out accounts of the foundation given by, and competence development, after completion of studies. Questions 9 and 12 were intended to draw out the effect of the participants' biggest responsibility and assess the degree of growth achieved. In addition, accounts from Graduate Recruitment Officers were collected (listed in Appendix D, page 154). As discussed in Table 9 (section 7.4.2, page 74), questions 4, 5 and 6 of the graduate recruitment research instrument were intended to assess the effects of real circumstances and their effect on employee growth. Of the 6 companies approached, all indicated that an increased sense of pride and confidence was achieved through work experience.

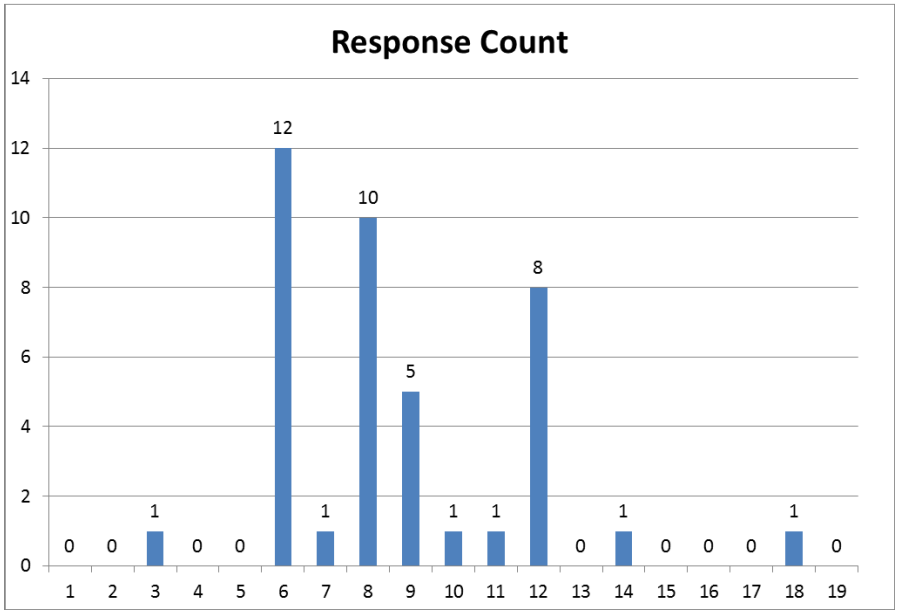

Figure 14 : Responses per Question – Reality

All 44 respondents referred to their third year or honours project as a significant contributor to their development. Response 70 emphasises the value of this project stating:

> *I think the main thing that shaped my career and my development was the third year, working on a real-life project, having to go out, find a client, someone to work for, getting business requirements from them, doing the whole thing from scratch and doing it all ourselves as a team and then having to just create this system on our own. It was a huge learning curve.*

This project enabled students to be *thrown into the deep end* (response 112). This is crucial as there is an expressed need to *jump in and get experience* (response 36). Being thrown in with *scaffolding* allowed learners to get their *first taste of a real world IS project* (response 123). Part of this experience allowed learners to realise the need to adjust and the need for flexibility (response 10). This echoes the sentiment of Crawford et al. (2006, p. 727) that programs should provide enough flexibility and customisability, and be so close to real that learners will be exposed to changes in varying circumstance.

Response 52 described this project as a catalyst forcing quick maturing and the first instance where *the academic and conceptual became tangible*. This sentiment was echoed in response 87 where, having completed the project, the learners had to present their project to an IT department. This led to their engaging and reacting *in a way that is far beyond academia; it's not just a fancy prototype but something that could actually work in the real world it gives it a sort of realism that is quite engaging*. This is an example of Froehlich et al. (2014, p. 31) sentiment that real situations can lead to other activities or incidental learning. In addition, the need for real experiences was emphasised through the emphasis of the need for serious consequences of failure. Response 67 indicated that meeting real clients was his largest responsibility, as representing a company would create greater consciousness of his actions and an instance where he faced Dreyfus (1999, p.19) "danger and harsh judgement of existence." In addition to presenting one's work to a company, the nature of the task was also shown to be a factor in competence development. In response 94, a learner complained that his work experience was limited to prototype systems. Though these prototype systems were well received, he was frustrated as he was aware that he had cut corners and if they were implemented they *would all fall apart*. His move into an established company, with team mates and clients enabled him to see *how things are actually done in the real world*. In consensus, and echoing Crawford et al. (2006, p. 727) call for "demanding, diverse and complex environments," response 128 indicated that the academic environment, where *sometimes your system goes live but in general it doesn't* and marks

are the primary driving force, there is the freedom to chop and change and *take out that piece of functionality* resulting in corners being cut. One could argue that there is a danger in spending time working without real consequences, as response 33 indicated an incident where a learner assumed he was strong, however realised when he started working that he had *lots to learn*.

By being able to cut corners, or work in situations where one does not feel the consequences of failure or a negative experience, could cause a learner to have a sense Firth-Cozens' (2001) feeling of invincibility or magical control over their abilities, and not have an understanding of the boundaries of their capabilities. Response 53 emphasised this stating:

> *I initially thought that I had the skills and the resources to fulfil the role comfortably; however I learnt very quickly that it takes more than an individual's performance to fulfil a role. There are so many exogenous factors that come into play and you soon realise the smooth completion of a task is the exception rule and not the norm.*

In support of this sentiment, findings from the Graduate Recruitment Officers indicated a tendency for graduates to arrive with a, *know it all attitude* (response Q3C1) that died off with humbling experiences of the workplace. Graduates were rarely *self-starters* (Q3C3) and needed direction; but they *asked to be thrown in the deep end* (response Q5bC6) and tended to *respond well* to this and felt *held back* when they were not (response Q5C2). Over time there was a growth in humility as well as pride in abilities (response Q4C1) through having real work experience.

Response 58 has a more existential approach to real consequences of failure: the respondent indicated the fact that he was working for himself and not working for free, allowed him to make his own path and pursue his own interest. Response 102 echoed this sentiment arguing that poor marks in an academic environment, even though they may be real, are hardly a sufficiently motivating consequence of poor performance. This is an indication that one tends to *grow with responsibility* (response Q5C4), Dreyfus' (1999) identity forming commitments, and a greater responsibility is likely to result in more growth.

The need for realism was emphasised in response 97 using the analogy of learning to ride a bike stating: *you can talk about it as much as you want, but unless you actually go and ride a bike you wouldn't know what is going on and you might fall a lot despite all the knowledge you have*. Response

108 also emphasised this point by using the analogy of learning to drive a car, stating that the learner needed to be put in the car in order to learn. Pressing the analogies further falling off a bike or stalling a car could be considered as facing the harsh danger of existence (Dreyfus, 1999) central to existential learning.

8.1.3 Findings on the Need for Reflection

As discussed in section 6.3.3 (page 61), reflection involves a learner looking back on their experiences and developing a vast repertoire of situational discriminations necessary to build their own sense of style. As Table 10 identified (in section 7.5.1, page 76) responses that indicated Reflection was necessary, could be identified as those where learners indicated that they found value in reflecting on their past actions and adjusting their approach. The key words identified were 'adjusted', 'retrospective', 're-try' and 'feedback'. Of the 44 alumni respondents, 41 (93.18%), made 50 statements (see Table 15 in appendix C, page 121) that emphasised reflection as being necessary in their development. As shown in Figure 15, an overwhelming majority of these statements were drawn from question 19. As discussed in Table 9 (page 74), Question 19 explicitly asked about the value of reflection and was intended to provide insight into the participant's perceived value. In addition, accounts from Graduate Recruitment Officers were collected (listed in Appendix D, page 154). As discussed in Table 9, section 7.5.2, questions 9 and 10 of the graduate recruitment research instrument were intended to assess the effectiveness and value of reflection in employee growth. Of the 5 companies approached, all indicated that they had some form of feedback or reflection mechanism in place.

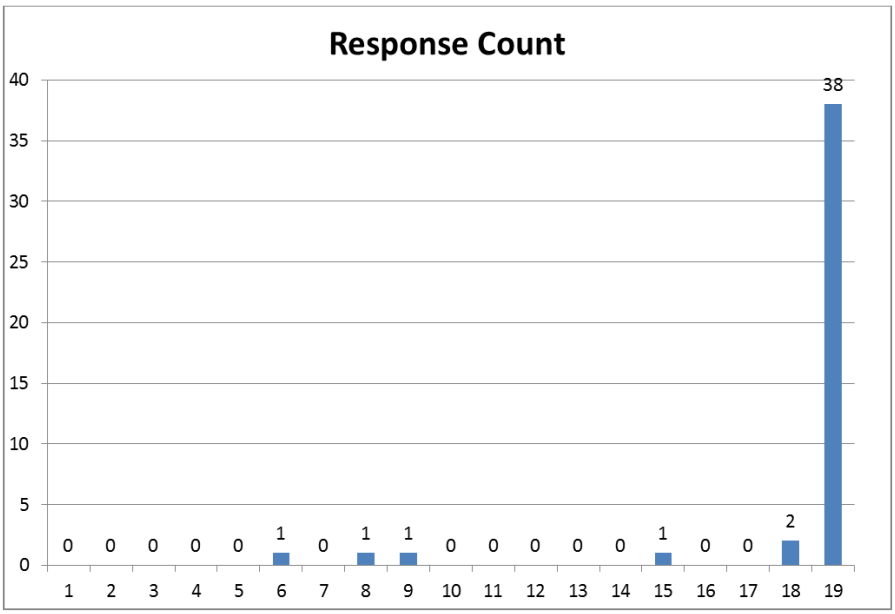

Figure 15 : Responses per Question - Reflection

Some graduates described reflection as an *essential part of learning* (response 51) that involves the need for one to *inspect and adapt* (response 90) and ponder *what did I do wrong, what did I do right?* (response 137) Thereby adjusting their approaches in order to give a *richer understanding* (response 54) of what is necessary.

It was interesting to note that in all responses, the respondents referred to their own experiences and the need for them to reflect and adjust on their own actions. Although in the interviews there were evidences of respondents blaming circumstance and external factors for some of their failures when asked about reflection, all respondents felt the need to adjust their own approaches and question their own assumptions. The responses contained 49, 35 and 23 counts of the pronouns "I", "you" and "we" respectively. In addition, only four of the responses contained reflective practices being triggered from external sources, such as SCRUM, feedback meetings, peer reviews or performance appraisals. This indicates support for the notion that reflection is one's own responsibility. This supports the notion that reflection can enhance the Psychological Ownership, established as fundamental in section 8.1.1, allowing learners to turn inward and adjust their approaches.

An important theme that emerged is that in all instances where reflection was identified as important, the respondents all identified their own past experiences. This supports Jordi's (2010) notion that reflection is an important part of experimental learning. It can only be achieved if there exists a real experience, which involves feelings, discomforts, emotions and intuitions that cannot be replicated in theoretical situations. These real experiences provide material to reflect on. As established in section 8.1.2 as being fundamental to learning, one must then reach *a point where you step and look back and say how did it change, and how did you change as a response to that to make a difference* (response 51).

In conducting the interview, the views expressed in response 91 led to an interesting discussion. The respondent stated that:

> *I think the knowledge or knowing that you accomplished that before, it always got more difficult but you were always sort of able to come back and attack it and win and that always makes facing each challenge less scary.*

The interviewer and respondent spoke of reflection as an emotional bank account where each success is like a deposit and each failure a withdrawal. Whilst the disappointment of failure is valuable as it can teach more valuable lessons, more successes lead to the elation of that success. This leads to enough deposits being built up so that when facing new challenges, practitioners can reflect and thereby draw from their metaphorical emotional deposits and face the new challenge with less intimidation. This directly confirms the sentiment presented in section 6.3.3 (page 61) that reflection that follows a real experience, helps the learner build a *reservoir* of past experiences necessary to build the confidence to move past a one best way or one fits all approach and deal with the messy and ill-defined (Kroeze et al., 2011) circumstances that characterise the field.

The responses from Graduate Recruitment Officers concurred with all respondents stating that graduates have an increased sense of pride and confidence from positive experiences. It was noted that timidity and hesitation faded by the *second or third* task (response Q5bC2), *died off after 6 months* (response Q5C1). This supported the notion that having real experiences to reflect on enhanced confidence and thereby serves as a metaphorical emotional bank account or reservoir. Whilst positive experiences were identified as important; all companies had some form of review programme stressing the need for managing expectations, and getting employees to inspect and adapt to organisational needs. Some achieved this through direct mentorship, while others used a mixture of formal and informal feedback mechanisms. Response Q10C2 stated that: *it's demotivational to wait a whole year to tell someone they're not getting an increase (or getting a poor one) because nobody bothered to tell them they were doing something wrong. You need to empower them early on to fix their problem*. This sentiment ties into Frith-Cozens' (2001) concerns, discussed in section 8.1.2, that learners need to be regulated against feelings of invincibility or magical control over their abilities. There is a need for one to experience real circumstances but also to be asked to reflect and give feedback on those experiences.

The views expressed by the respondents are an overwhelming endorsement of Kierkegaard's view that in order to progress and develop, it is essential that learners be aware of their own natures and have "self-knowledge" through consciously and deliberately taking King and Lyytinen's (2003, p. 143) "bold intellectual reach" (which involves exploration, investigation, collaboration in unpredictable circumstances), rather than a "tight disciplinary grasp" of best practices.

Whilst there was overwhelming acknowledgement of reflection as useful tool in self-development, there were two respondents who dissented. In response 119 a respondent stated that *I don't think looking deeply into your past is really going to improve you, as long as you understand what you did wrong when you do it, you can improve, that would be my view.* This statement indicates an acknowledgment of the importance of understanding of the past, but questions the value of pondering, overanalysing and lingering on events or experiences that cannot be taken back. Response 77 indicated a mixed view of reflection. The respondent stated: *It depends. Sometimes they're relevant and applicable. Sometimes they're like tampering with a healed wound that is best left sealed. I guess it's all relative to the issue at hand as well as the circumstances that would warrant such a reflection. It does not always have the desired effect*.

8.1.4 Findings on the Relationship between Categories

In the previous three sections, data and findings were presented that demonstrated confirmation of the importance of the existential categories of Psychological Ownership, Reality, and Reflection. Figure 7, in Chapter 6, suggested a cyclical relationship between these categories. Figure 16 is an enhancement of Figure 7 (page 64) that includes the relationships found in conducting the research. It was suggested that Psychological Ownership could be instilled by the learner being exposed to a real circumstance (relationship 2). The exposure to a real circumstance would cause the learner to be more emotionally involved and thereby take more ownership of the task (relationship 3). The emotional involvement would lead to the learner reflecting on their experiences and building a reservoir or emotional bank account of past experiences (relationship 4) to draw from when going forward, thereby enhancing their Psychological Ownership (relationship 1).

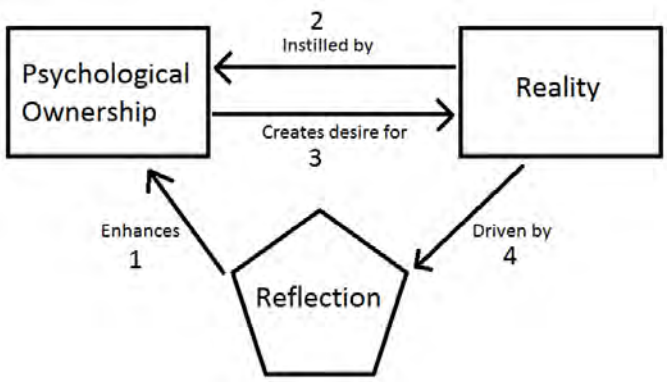

Figure 16 : Cyclical Relationship of Existential Factors

Source: Researcher's construct informed by Gardiner (1988), Candy (1991), Dreyfus (1999), Dreyfus (2001), Druskat and Pescosolido (2002), Reffell and Whitworth (2002), Raelin (2007), Jordi (2010).

Table 11 lists some key phrases from graduate responses that indicated the relationship between the existential categories.

Table 11 : List of Quotes indicating Relationships between Existential Categories

Relationship	Key Word / Phrase	Origin	Response Number	Explanation
1	Step and look back	Reflection	51	As a result of reflection one steps back, inspects and adapts and changes their approach by re-applying knowledge gained. This indicated taking responsibility for one's growth and development.
1	Inspect and adapt	Reflection	50	
1	You change	Reflection	51	
1	Re-apply the knowledge that you gained	Reflection	32	
2	Sort of my baby	Reality	72	These responses indicated the tangible nature of the project, meaning that there was more engagement and greater consciousness, thereby increased ownership.
2	Greater consciousness	Reality	67	
2	Engaging	Reality	87	
2	Tangible	Reality	52	
2	Actually go	Reality	97	
3	Work things out	Psychological Ownership	89	These responses indicated that the fact that the learners were given autonomy or ownership over the nature of the project, meant that they had to fend for themselves, could work on their passions thereby making them more willing to investigate and work things out. This enhanced the realism as the experience was owned by the student.
3	Fend for ourselves	Psychological Ownership	89	
3	Passions	Psychological Ownership	3	
3	Willing to investigate	Psychological Ownership	34	
3	Owned by the student	Psychological Ownership	81	
4	Understand what you did wrong	Reflection	119	These responses indicated that having had experiences gave the learner material to reflect on, thereby enhancing their ownership through having a richer understanding of what they did wrong.
4	Richer understanding	Reflection	54	
4	It could be quite awkward	Reflection	139	

Further evidence of a relationship between Psychological Ownership and Reality can be demonstrated by the fact that most responses that indicated these categories as useful were drawn from Questions 6, 8 and 9 when the learner was asked to reflect on their third-year project as well as their growth after university. Many respondents felt that this was a very important part of competence development. Response 70 stated that:

> *I think the main thing that shaped my career and my development was the third year, working on a real-life project, having to go out find a client, someone to work, for getting business requirements from them doing the whole thing from scratch, and doing it all ourselves as a team and then having to just create this system on our own. It was a huge learning curve and we had to mostly self-teach ourselves majority of the stuff, especially as far as the development is concerned. In fact more so with the development not so much the analysis so yeah, lots of learning and very challenging and I think working on a team was also, the actual teamwork, slotting into roles, everyone finding their comfort zone and what they were good at and also being on such an ambitious team where everyone was pushing themselves, pushing each other.*

When assessing this response, a very clear relationship between reality and Psychological Ownership the cyclical relationship can be identified. Table 12 lists key phrases and explains their categorisation.

Table 12 : Analysis of response 70

Number	Phrase	Category	Explanation
1	*"working on a real life project"*	Reality	Close to reality
2	*"doing it all ourselves as a team"*	Psychological Ownership	Turning inward, not passively waiting to learn
3	*"a huge learning curve"*	Reality	Real consequences of failure
4	*"had to mostly self-teach ourselves"*	Psychological Ownership	Turning inward, not passively waiting to learn
5	*"lots of learning and very challenging"*	Reality	Harsh danger of existence
6	*"the actual teamwork, slotting into roles, everyone finding their comfort zone"*	Psychological Ownership	Taking ownership of a role, an identity forming commitment
7	*"such an ambitious team where everyone was pushing themselves, pushing each other"*	Reality	Real people pushing each other and facing the harsh danger of existence

As a result of the real nature of the project, the learners took ownership and developed themselves. Response 90, when discussing the move from third year to fourth year, supported the notion that having completed the project gave the learners material to reflect on by *being able to inspect and adapt* and gain an understanding of one's ability by understanding where *the pain points are going to be*. Through being *honest enough with yourself and being retrospective* in admission of areas of failure, one builds actions that prevent themselves from repeating mistakes in the future. By being exposed to the real consequences of the third-year project, the learners experienced emotions and feelings that lead to their taking ownership by *being honest enough* with themselves, being *retrospective* through reflection, and changing their approach in the second experience. Response 35 echoed this sentiment stating that reflecting on a real experience was a *huge part in honing skills* because it allowed one to *learn from your mistakes* and *from other people's mistakes*. Through this reflection and discussion with other people one reflects and adjusts their approach by finding out *what would they do differently next time* by taking *advice*, and ensuring that in a different situation mistakes are not repeated. In addition, response 66 argued that being exposed to real situations and taking ownership, one recognises the need to reflect and change with *each project that comes along*.

8.2 Research Question Two

As discussed in Chapter 4, the role of the academic arm of the field is under debate which has resulted in a persistent skills expectation gap between industry expectations and university output. Whilst the role of universities is debated, Chapter 4 established that it was reasonable for undergraduates to be focused on learning skills that would prepare them for jobs in industry. Section 6.4 (page 64) suggested that academic institutions could achieve this by instilling the existential characteristics of Psychological Ownership, Reality and Reflection by making learners work on a variety of real projects, in real teams, and enforcing choices of social context and specialisation. It was suggested that through these commitments learners would form an identity. Research question one focused on assessing whether the existential interventions were in fact useful in the learners' development. Research question two focused on the relationship between academic preparation and subsequent career trajectory. An interpretive, inductive approach was taken in assessing the role academia played and how it may have affected learners preparing for industry.

As discussed in section 7.5.2 (page 77), inductive reasoning involves generalisation of observations seeking to build theories. In attempting to explore the role/effect of the academic institution, the

researcher asked the participants to discuss their experiences before, during and after their third year. Through surveying and categorising the responses, three key findings were induced. The responses are listed in Appendix C (page 121). Though the intention was to assess the effect and role of academia, it was pleasing to see that the statements made in each of the findings, presented in the sections below, echoed the need for an existential approach to learning presented in section 8.1. In addition, accounts from Graduate Recruitment Officers were collected and are listed in Appendix D (page 154).

As discussed in Table 9, section 7.4.2 (page 74), questions 3 and 8 of the graduate recruitment research instrument were intended to assess the readiness of graduates for industry. Of the 6 companies approached, five indicated that there was evidence of a gap between academic output and industry needs that they needed to address. The sixth company said transition into industry was smooth for graduates who had completed an honours year.

8.2.1 Indication that Real Project Experience was the most Fundamental Experience

As discussed in section 7.3 (page 69), the third-year project involved each team identifying a sponsor in industry and going through all stages of the SDLC: from requirements elicitation to construction and development of the project. As discussed in Chapter 6, and presented in Table 6 (section 6.3.2, page 59), the literature contained an overwhelming call for academic programs to link curriculum to real or near real-life situations. Through examining responses, the researcher noticed an echo of the findings presented in section 8.1.2: all 44 participants identified their third year or honours systems development project as a significant part of their development as it contained real situations with real consequences which helped motivate them to develop themselves concurring with Lynch et al. (2004) relationship between learning and increased levels of responsibility.

In line with Dreyfus' (1999) call for learners to face the danger of existence, it was regarded as a *make or break experience* (response 144). The fact that it *mirrors life on client projects* (response 142), results in students working *in a very real-life scenario with a sponsor outside of campus* (response 143) and leads to students being exposed and interacting *with clients and building the project from the ground up* (response 153). This results in *the academic and conceptual becoming tangible* (response 52). The project is not *just a fancy prototype, but something that could actually work in the real world* (response 168). One student described it as *the main thing that shaped my career and my development*

(response 161). As discussed in section 7.3, the third year and honours project allowed learners to form their own teams, choose a specialisation, sponsor for industry, and build a system that caters for its needs. Despite the projects being vastly different from each other, all 44 learners regarded it as fundamental, useful experience in their development. It would appear the generic curriculum discussed in section 4.3 would not be problematic if the learners are instilled with the existential boldness necessary to adapt to differing circumstances. As Lynch et al. (2004, p. 440) argued, this intentional ambiguity and openness can lead to *a deeper understanding of the wider opportunities* of a task. Moore et al. (2014, p. 121) concur, arguing that transparent collaboration, rather than authoritarian dictators can lead to learners taking more responsibility for themselves.

In addition to the expressed need for experiences with real world situations, and the process being useful to learner development, it was interesting to note that there was not a single reference to traditional teaching methods such as case studies or exams, being useful in learners' development. As discussed earlier Perelman (1993) and Campbell (2011) argued against traditional teaching methods arguing their effectiveness being limited to filtering out students rather than inspiring growth. Response 174 indicated dissatisfaction with the traditional teaching methods. The respondent stated that: *We were taught coding with pen and paper. You don't teach someone to drive unless you put them in a car so that's the issue I had. Processes like that can and should be changed.* One respondent did mention an exam as being a significant contributor to his career path, but this contribution was in a negative light as the bad experience moved him away from choosing to specialise as an analyst.

8.2.2 Evidence of a Lack of Readiness for Industry

As discussed in section 7.5.1 (page 76), question 8 was included in the study to assess the learners' perceived readiness for industry after their third year. Of the 44 participants, 24 (54.55%) felt they were not prepared for industry. Response 190 echoed the sentiments of section 8.2.1 stating a lack of *the right type of experience.* Response 226 indicated a readiness for *junior level* with an understanding that one would *have to be prepared to learn a lot* and not be *left alone and know what to do straight off the bat.* In terms of skills gained, *the basic framework was there* but it was not *100% complete* (response 194). In moving to industry, a *jump in the curve* (response 204) and a *baptism of fire* (response 106) were identified. In contrast to the expectation argued in Chapter 4 that learners would go to university with the understanding that it would prepare them for jobs in industry, the academic environment seemed to provide limited readiness and rather gave *kind of the minimal basics that you*

need to survive (response 221). Response 217 indicated that *in terms of percentage, I would give it a 60%* implying that the preparation is *adequate maybe, ideal, probably not* (response 223).

As found by Seymour et al. (2006), there was a mismatch of graduate skills and industry needs. From the perspective of the Graduate Recruitment Officers, whilst one company stated that honours graduates had a "smooth" transition into industry (response Q3C6), most graduates were regarded as *not self-starters* (Q3C3) and needed direction. This was achieved through *scaffolding with low critical* (response Q5aC1) projects that would ease them into the workplace and through support from team members (response Q5aC2). In addition it was observed that they arrived with a *know it all attitude* (response Q3C1) and lacked skills such as *basic email etiquette* and knowledge of *how to operate in the corporate environment* (response Q3C4). All companies stated that they usually hire based on *cultural fit* and understood the need for moulding interventions to be in place.

8.2.3 Encouragement for an Honours Year

As discussed in section 7.5.1 (page 76), question 8 was included in the study to assess the learners' perceived readiness for industry after their third year. As discussed in section 8.2.2, the majority of the learners did not feel ready for industry. In addition, of the 44 participants, 28 (63.64%) stressed the need for students to complete an honours year.

The sentiments of section 5.4 (page 45) that stated that the lack of truth and turbulent nature of the field resulted in learners not being able to rely on credentials, are supported by the fact that none of the participants valued their qualifications as useful in their development. Although 28 of participants (63.64%) encouraged enrolling for an honours year, those who held this perspective did so because of the experience and exposure involved in that year and not the title of "Honours graduate." Participant MSC2008JG3 stated that in his experience, he would:

> *prefer people to have done a fourth year, purely that second project provides a lot more skills based development on their part and so in terms of hiring capabilities I know companies… [censorship of company name] and I have heard other companies saying they prefer people who have done two projects purely because of the additional development knowledge that they have gained during that period.*

The Graduate Recruitment Officers were not explicitly asked about the honours year however company six, in response to Q3C6, stated that they had primarily focused on hiring honours students. In addition one respondent (response Q3C2) stated that:

> *In most cases, there is a noticeable difference between a third year student and an honours student. We find a good alignment of our expectations with honours year students, as they are usually more self-sufficient, better at managing themselves and their deadlines, take more initiative, and exhibit more proactive communication habits.*

Students concurred with this view indicating that they needed more coaching and development (response 199). The honours year added an *extra layer* that was *closer to an industry experience* that was highlighted as *essential* (response 201). It identified as a year which *takes all the strings (of third year) and ties them together* (response 188). In reference to the honours year experience, words such as *cemented* (191), *solidified* (193), *building on* (206), *shaped* (212), *broader understanding* (224) and *rounded* (229) were identified. The most telling response (213) was one in which a student described the honours year as a second chance; having his confidence *knocked* in third year, he used the honours year to draw confidence from applying the *lessons learned*. Response 213 serves as an example of the learner having to "confront the danger and harsh judgement of existence" Dreyfus (1999, p. 19), turning back and reflecting on his experience thereby examining elements, "appreciating some" while "discarding others" (Wieringa, 2011, p. 172) in his approach to the second project experience thereby depositing confidence into his reservoir or emotional bank account. This second chance allowed him to further remove the metaphorical scaffolding, move towards autonomy, and find his "groove" (Schön, 1983).

8.2.4 Summary

Research question two was focused on the relationship between academic preparation and subsequent career trajectory. Through an interpretive, inductive approach the researcher found confirmation of a lack of readiness for industry. However it was also found that the near real-life experiences of the third year systems development project were the most crucial and valuable aspect in competence development of learners. Furthermore, graduates and Graduate Recruitment Officers stressed the need for the honours year to allow them to solidify their experience by applying lessons learned from the third year, thereby drawing confidence from a more successful second attempt at a project. The university experience could be graphically demonstrated by Figure 17 (which is an application to the UCT environment, of the more generic model shown in Figure 8 (page 65)). The third-year project could serve as Raelin's (2007) provocation deemed necessary to force learners to

develop themselves. Through making a commitment to a certain social context and specialisation, the learner could then reflect on that experience and inspect and adapt their approach for the second experience (the 4th year or honours project). Through this process the learner would have made identity-forming commitments and built their own sense of style based on their interests, passions and wills. They can then take those interests, passions and wills forward into industry.

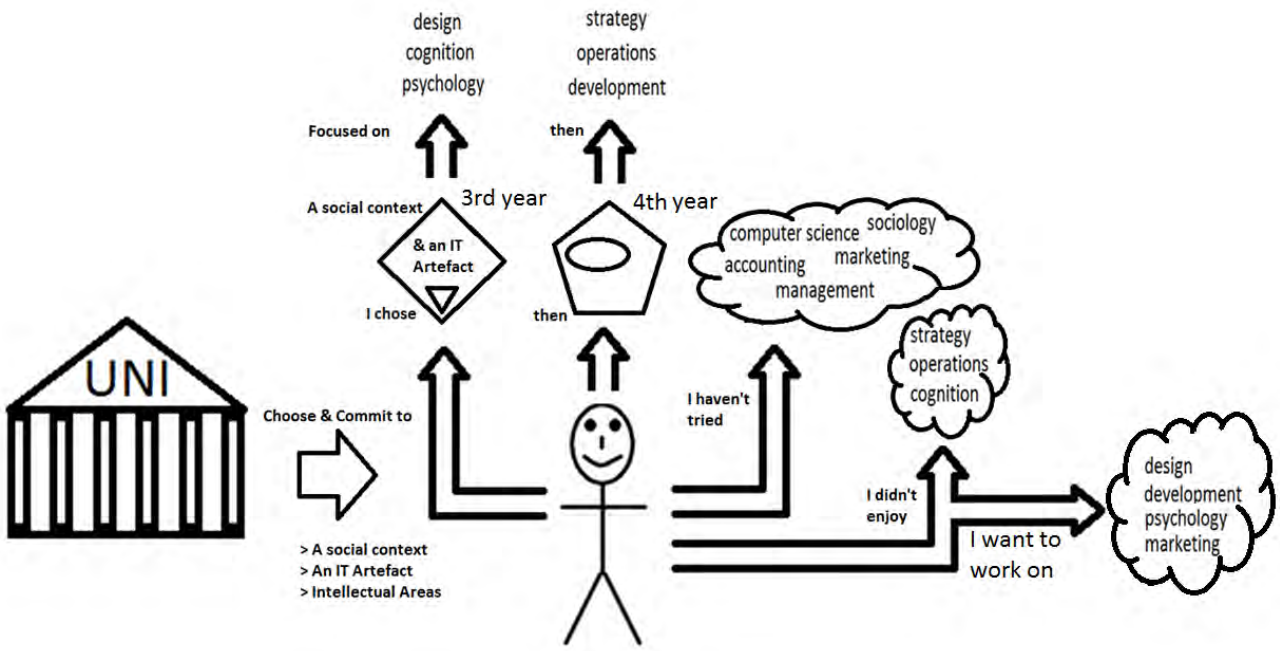

Figure 17 : UCT IS Department provoking learners to: Own, Do, Reflect

Source: Researchers construct informed by Gardiner (1988), Candy (1991), Dreyfus (1999), Dreyfus (2001), Druskat and Pescosolido (2002), Reffell and Whitworth (2002), Raelin (2007), Jordi (2010).

8.3 Research Question Three

As discussed in Chapters 4 and 5, the vast intellectual scope of the field may result in there being an imbalance of priorities and focus on different factors. It was argued that a learner's choice of a role or specialisation may be a naïve, uninformed decision, as 84 relevant roles were identified (Richards et al., 2011). In contrast to medical or accounting students, who graduate as standard graduates, the IS learners would need to make potentially career-defining decisions about specialisation during, or even before the start of their degrees. Ezer (2006) identified this phenomenon globally, Brown et al. (2008) identified inconsistencies of culture (mainly collectivism against individuality), while Topi et al. (2010) argued that different institutions should apply curriculum that is regionally relevant. Research question three was focused on the role and effect of teamwork in competency development with a focus on the effects of peers on role choice. It was suggested that a group experience could result in

learners facing a metaphorical fork in the path of their development, which could send them into a particular role or area of specialisation. In attempting to inductively explore findings around the role/effect of the teamwork in competency development, the researcher, in questions 2 through to 8, asked the participants to discuss their areas of specialisation before, during and after their third year. The responses are listed in Appendix C (page 121). Through surveying the responses and categorising them, three key findings were induced and are discussed in the sections that follow.

8.3.1 Teamwork is Important

As discussed in section 8.2.1, all 44 of the participants identified the third-year project, which was the first major group experience, as a significant part of their development. Of these 44 participants, 31 (70.45%) made statements (listed in Table 19 in Appendix C, page 121) that explicitly highlighted teamwork as a central part of their development. Teamwork was described as *key to career development* (response 5). It provided real project management exposure as *people who had different strengths and weaknesses* were placed in the same space (response 8). This resulted in situations which were *awkward*, *quite tough* and *nasty* (response 139), resulting in unique circumstances and conflict resolution exercises. This confirms Froehlich et al.'s (2014, p. 31) argument that near real-life situations can lead to learning that is "a by-product of some other activity, and may happen unconsciously or incidentally." By facing these tensions and conflicts, one could argue the students faced Dreyfus' (2001, p.19) "danger and harsh judgement of existence" as tension and conflict of this kind cannot be replicated in textbooks. There was an element of comradeship where students *learned a lot and fed off on each other's learning energy* (response 104), whilst *pushing themselves* and *pushing each other* (response 70). This echoes the sentiments of both sections 8.1.2 and 8.2.1 that carried sentiments calling for learners to move away from isolation.

The danger of isolation and the usefulness of team experience were also shown in response 55, where the participant indicated that being part of a team and the fact that they *were happy* with their performance, led to *confirmations* from the team resulting in confidence. Response 92 concurred: the respondent spoke of the difficulty experienced in working in isolation and directly contrasted it to the benefit obtained from the *input from other people* when working on a team. This was an extreme case in which the respondent claimed to have learned more in 3 weeks of teamwork than in 6 months of isolation.

8.3.2 The First Project Experience acts as a Metaphorical Fork in the Road

As predicted in the literature survey, the first project instance acted as a metaphorical fork in the road which lead to learners picking an area on which to focus. As discussed in section 7.5.1 (page 76),

questions 3, 4 and 5 of the graduate research instrument were designed to provide insight into changes of roles and focus as a result of the third year programme. Through the process of organising and categorising these responses, Table 18 (in appendix C, page 121) was prepared. It clearly shows that 24 (54.55%) respondents changed roles during their third year. As shown in Figure 18, 8 of the 24 participants (33.33%) moved away from a generalist role and chose a specialisation. Response 70 highlighted the team experience as one which allows *slotting into roles, everyone finding their comfort zone and what they were good at*. Response 101 echoed the sentiment stating that:

> *The fact that we were in a group and we sort of found our own strength within that group, so certain people were good at certain things which meant that you necessarily couldn't be the strength in that area, so you sort of found your areas so I found myself being pushed into that more analyst documentation role.*

A learner could be *dynamic enough to switch roles* and also be *exposed to other areas* (response 115). In the theoretical framework developed in Chapter 6, Raelin (2007) argued that students would be unlikely to change without provocation, while Dreyfus' (2001) ethical sphere of existence called for learners to make identity-forming commitments. One could argue that being placed in a team was provocation that leads to learners choosing roles, thereby forming an identity around that role: commitment to a role could be seen as an identity-forming commitment.

8.3.3 Further Research could be conducted into Role Movement

As discussed in Chapter 4, a point of contention can be found around the exclusion of development (or programming) as a mandatory subject in the IS2010 guidelines. Kroeze et al. (2011, p. 382) argued that its removal would reduce learner's ability to appreciate the analysis, modelling and managerial roles, thereby placing an emphasis on "instrumental knowledge" rather than enforcing an obligation to "engage in the development of reflexive knowledge." Figure 18 shows the changes in roles. It was interesting to note that, of the 24 participants who switched roles after their first team experience, the role of development (or programming) attracted the most turbulence: 12 respondents (50%) moved away from development or programming, and 8.5 (35%), moved into a development role. There was also a lack of quality assurance (QA or testing) as few participants identified with the role prior to industry. It would appear that development is an area that sparks attention.

In addition, during an informal presentation of the research, a member of the audience raised concern that: in her experience there was a presence of bullying of female learners away from development roles. Although in surveying the literature the researcher came across such sentiments (Brown et al.,

2008), it was not the intention of this research to analyse perceptions of development or a presence of any bullying in role choice. The researcher does not feel the sample is large enough to draw conclusions or suggest relations about perceptions around development, however the movement away from development and the fact that less than 25% of those who classified themselves as developers were female, could warrant further research into perceptions of roles, gender discrimination and bullying in role selection.

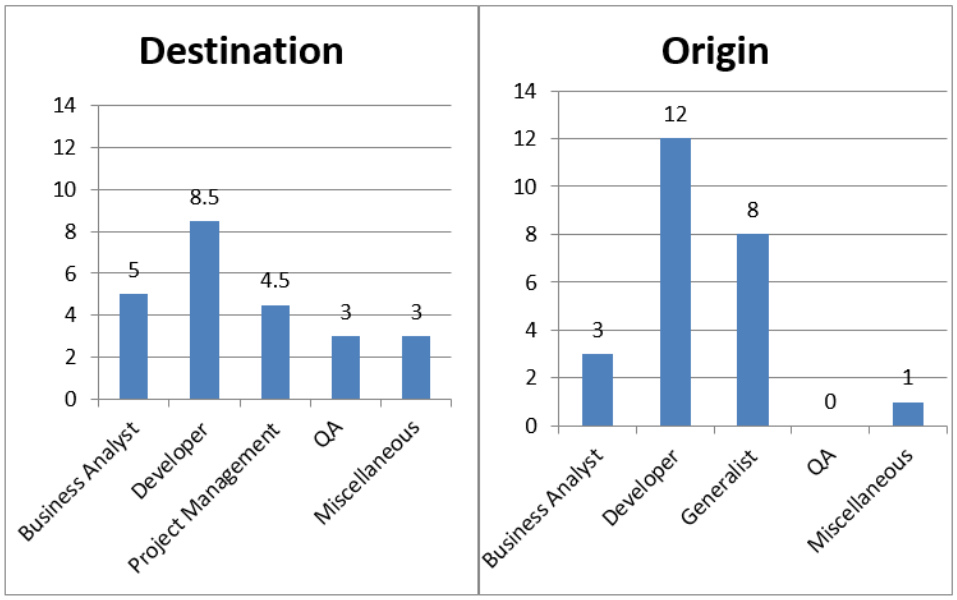

Figure 18 : Role Switching – Destination and Origins

8.3.4 Summary

Research question three was focused on the role and effect of teamwork in competency development with a focus on the effects of peers on role choice. It was suggested that a group experience could result in learners facing a metaphorical fork in the path of their development, which would send them into a particular role or area of specialisation. Through an interpretive inductive analysis of the responses to questions 2 to 8, the researcher found that teamwork added a sense of realism to the experience as learners needed to deal with each other. This provided both conflicts that cannot be replicated in case studies, and confirmations that boosted learner confidence. In addition, the presence of team mates meant that the project served as a metaphorical fork in the learner's path. As demonstrated in Figure 19, the vast intellectual territory of the field meant that learners needed to slot into roles thereby focusing on an intellectual area, finding strength in that area, and forming an identity around it.

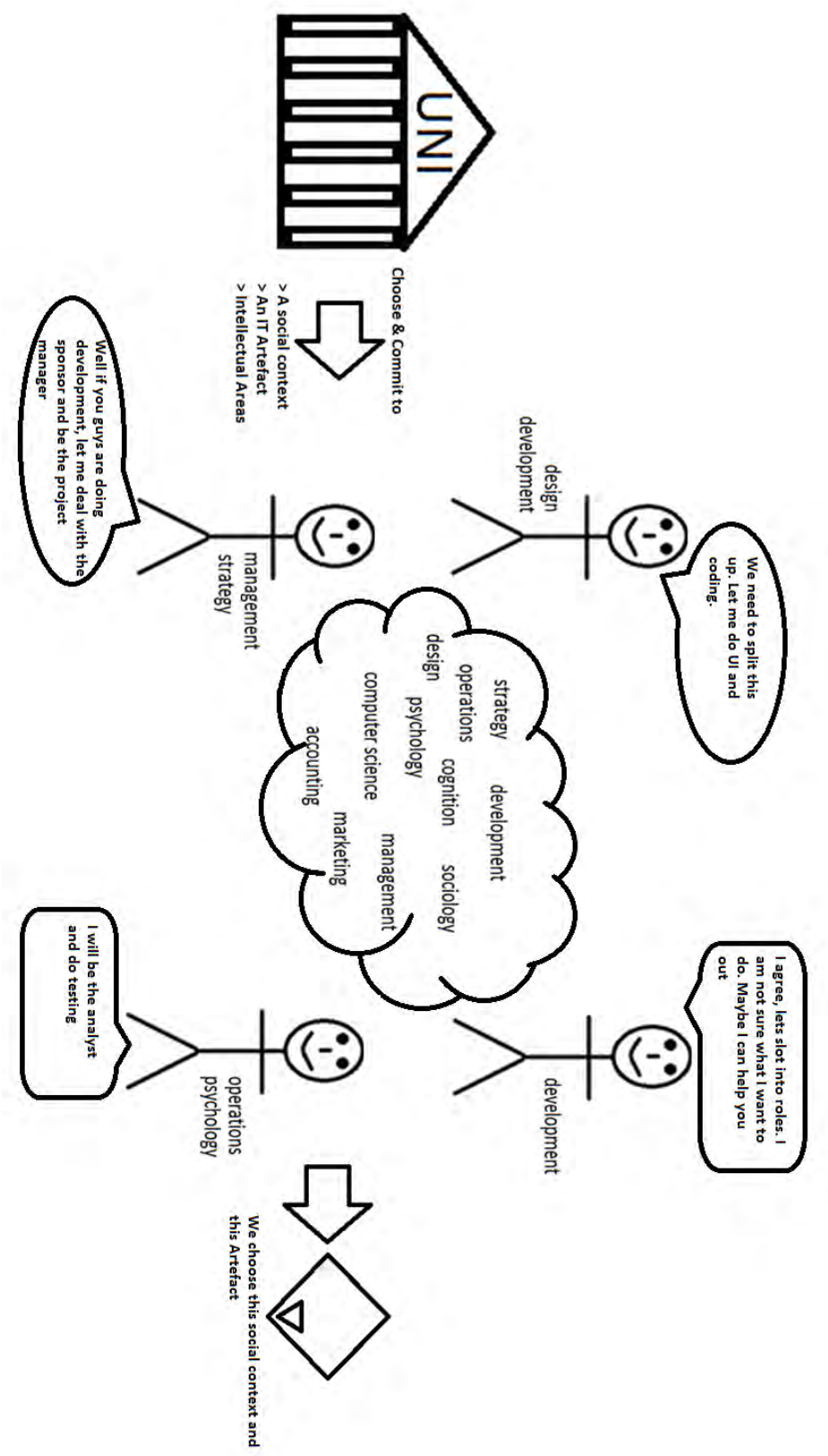

Figure 19 : Team Members Slotting into Roles

Source: Researchers construct informed by Gardiner (1988), Candy (1991), Dreyfus (1999), Dreyfus (2001), Druskat and Pescosolido (2002), Reffell and Whitworth (2002), Raelin (2007), Jordi (2010)

9. Conclusion

Through gathering of reflective accounts of graduates who had attended the University of Cape Town and become practitioners in industry, as well as Graduate Recruitment Officers who had experience hiring students out of university, the research sought to test the theoretical framework, developed in Chapter 6, whilst also seeking insight into the role of the academic intuitions and teamwork in competence development. The findings of this endeavour were discussed in Chapter 8. This chapter seeks to summarise the findings and argue the contribution and importance of the findings to the IS body of knowledge. The claim for relevance and rigour is argued in section 9.1. Each of the research questions, and their findings, are discussed in sections 9.2 to 9.4. The acknowledgement of the limitations is discussed in section 9.5 and final remarks are presented in section 9.6.

9.1 Claim for Relevance and Rigour

Throughout this thesis there have been references to literature that identify the IS field as one which faces questions of legitimacy, lacks an identity, has conflicting ideologies, and suffers from a gap between industry expectations and academic output. This was established as a persistent characteristic of the field. An abundance of research, presented in Chapter 3, has been conducted and was discussed on what approach would be best in attempting to correct the issues caused by the nature of the field. The intention of this research was not to suggest a possible solution or best practices for the field, but rather to examine the concern the nature of the field may have on the competency development of students.

In surveying literature it was found that this is a relevant concern as, due to the fact that the field lacks authoritative and regulative bodies, the academic side of the field lacks consistent application. It was noted in Chapter 4 that curriculum guidelines were becoming increasingly generic, and it was acknowledged that regions or institutions should prioritise factors differently. This led to the argument, presented in Chapter 5, that the field lacks an overriding truth and relying on the credentials of a single institution would be inadequate. It was argued that in place of a credentialist mindset, the characteristic of existentialism, presented in Chapter 6, is a possible necessary tool that could be instilled in learners to help them contend with the nature of the field. As this concept is generic and abstract, a rigorous literature survey was conducted and a theoretical framework was developed. In building this theoretical framework, three categories of existential interventions were induced and identified as necessary (Psychological Ownership, being in touch with Reality, and

Reflection) characteristics that academic institutions could instil in learners that would prepare them for the nature of the field.

One could therefore argue that conducting the research, to test the theoretical framework, assess the role of the academic environment in preparing students for industry, and assessing the role of teamwork were necessary and relevant endeavours. Assessing the theoretical concepts to a single case or institution, in this case UCT, allowed theoretical concepts to be applied and tested in a real environment. The participants comprised of both Alumni and Graduate Recruitment Officers, thereby allowing rigorous assessment from multiple perspectives. As will be discussed in the following sections, there was an element of commonality between the responses from the sample: most graduates had similar views on what interventions were necessary and what best practices could be followed. In addition, Graduate Recruitment Officers, none of whom were graduates from UCT's IS Department, echoed the sentiments of the graduates.

9.2 Contribution of Findings for Research Question One

Research question one (What do graduates recall as the factors, interventions, experiences and preparation that have contributed to their development?) focused on testing the value of the characteristic of existentialism as a tool against the diverse and changing nature of the IS field. Existentialism is a generic and abstract concept therefore the specific interventions of Psychological Ownership, being in touch with Reality, and Reflection, were induced from literature and found to be central to competency development in students. Testing of the constructed theoretical framework was done deductively by analysing reflective accounts from graduates and Graduate Recruitment Officers.

9.2.1 Finding: Psychological Ownership of Work enhances Student Interest

Discussion:

Ample evidence, identified in section 8.1.1, was presented to suggest that students took more interest in studies when the work they were required to complete had personal relevance. This sentiment was echoed by Graduate Recruitment Officers who noted that graduates had a tendency of being *more excited* about their own ideas, resulting in their taking Dreyfus'

(2001) passionate involvement necessary to engage with a task, break a task down for serious purposes, and grow from it.

Contribution:

This finding is of both theoretical and practical importance. Theoretically, it serves as confirmation of literature suggesting that learning should be self-directed and learners should seek personal relevance in their studies. As Aspin and Chapman (2012) suggested, it proves the need to move away from the passive mentality of viewing oneself as a metaphorical jug waiting to be filled with knowledge. Instead, a self-sustained and self-governed approach to competence development must be taken (Bryant & Land, 2012). Practically, it serves as evidence that providing students with more freedom and autonomy allows them to take Psychological Ownership of a task, thereby enhancing their interest and participation in it.

9.2.2 Finding: Being in Touch with Reality enhances Learner Experience

Discussion:

Again ample evidence, identified in section 8.1.2, was presented to suggest that the presence of near real situations and circumstances lead to students engaging more with material. By having a tangible task, there was an element of responsibility and accountability that allowed learners to feel Kierkegaard and Dreyfus' elation of success and despair of failure necessary to facilitate growth. This sense of realism went beyond a marks system, which was explicitly criticised as insufficient motivation, and allowed learners to mature faster. Graduate Recruitment Officers noted that students often arrived with a *know it all* attitude and being exposed to real work humbled them into a more realistic view of their abilities. One could argue that it was when the students confronted Dreyfus' (1999) danger and harsh reality of existence, that they were humbled and gained greater consciousness.

Contribution:

This finding has theoretical value as it echoes the sentiments of an abundance of literature, as listed in Table 6, calling for real students to be exposed to real, or near real experiences. In practical terms there is evidence to suggest that students should move away from theoretical case studies and seek real circumstances with real consequences of success or failure.

9.2.3 Finding: Reflection allows Learners to grow from Experiences

Discussion:

Ample evidence, identified in section 8.1.3, was presented to suggest that the act of reflecting on one's experiences results in growth. Reflection could serve as a metaphorical reservoir or emotional bank account. By reflecting on one's past experiences, students can draw confidence from successes and draw lessons from failures. A fundamental part of this finding was that most who indicated reflection as valuable, highlighted the value of self-driven reflection: the need to inspect and adapt to different circumstances. As stressed by Brewer et al. (2006), IS development involves practitioners reflecting on the needs of the environment they serve. As argued in section 5.4, a result of the differing environments and possible circumstances, rather than relying on an authoritative truth, should enable one to construct new truths in the moment. One must gain the consciousness necessary to create different truths to contend with the changing and uncertain nature of the field. Graduate Recruitment Officers concurred with view, as all companies approached had feedback or reflection mechanisms in place which resulted in managing expectations with graduates and enabled convergence on graduates' perceptions of their ability.

Contribution:

This finding has both theoretical and practical importance. The literature presented on reflection (Dreyfus' (1999) arguing that effective learning can be achieved by learners directing their attention to their own nature, as well as Raelin's (2007) arguing the worthlessness of an unexamined life), being generic and abstract. This research and this finding serve as evidence of the value of reflection in the context of IS competence development. In practical terms it serves as proof that there is value in institutions, academic or otherwise, having reflection mechanisms in place, not only to punish and reward, but to build confidence and manage expectations of ability.

9.2.4 Finding: Psychological Ownership, Reality and Reflection are not Mutually Exclusive

Discussion:

Ample evidence, identified in section 8.1.4, was presented to suggest a cyclical relationship between the existential interventions of Psychological Ownership, being in touch with Reality, and Reflection. It was found that having a real, or near-real project experience and giving the students freedom to make it their own, caused learners to take Psychological Ownership,

thereby engaging more with the task. In addition, having those engagements with real experiences caused learners to have a reservoir, or emotional bank account, of experience on which to reflect. Through reflection, learners could form a perspective of their abilities, thereby enhancing their Psychological Ownership and enticing them to seek more real circumstances. In approaching those real circumstances the learners could approach them with an understanding of the need to change their approach for each project in which they participate.

Contribution:

This finding has both theoretical and practical importance. Theoretically, the process of deduction led to the construction of a theoretical framework, presented in Chapter 6: that a cyclical process of taking Psychological Ownership, being in touch with Reality, and Reflecting on one's real experiences is central to competence development. The theoretical framework developed could serve as a basis for future empirical research and thereby extending the IS body of knowledge around competence development. In practical terms, it could serve as a framework for justifying the use of these symbiotic existential interventions.

9.3 Contribution of Findings for Research Question Two

As discussed in Chapter 7, this research question (Is there a relationship between academic preparation and subsequent career trajectory?) was focused on suggesting the role academic institutions should play in preparing students for industry. The findings were found inductively through categorising reflective accounts from graduates as well as Graduate Recruitment Officers.

9.3.1 Finding: Real Project Experience is the Most Important Experience

Discussion:

Sections 8.1.2 and 9.1.2 were focused on presenting the need for students to be in touch with Reality as a key existential activity central to competence development. This sentiment was echoed in section 8.2.1. However, this finding is not centred on the usefulness of real project experience or being in touch with reality, but rather on stressing that ample evidence was found to suggest it was regarded as the most important experience in the students' academic careers. Real or near-real experiences allow learners to move beyond the authoritative limitations of theoretical case studies and allow bold learner-centred exploration.

Contribution:

It was not the intention of this research to argue against traditional teaching and evaluation methods (such as case studies, exams, low marks as a motivator, etc.). However, no respondent considered traditional teaching and evaluation methods as useful in their development. In addition there was a unanimous endorsement of the usefulness of the real nature of the third-year project, with some considering it a career defining moment. This could serve as justification for further research into the adequacy or inadequacy of traditional teaching methods for IS students. In addition, it serves as confirmation of the theory presented in Figure 8, section 6.4, that academic institutions should provoke learners into growth by making them choose and commit to real projects and real specialisations, thereby enforcing them to make identity-forming commitments.

9.3.2 Finding: Evidence of a Lack of Readiness for Industry

Discussion:

Section 8.2.2 presented arguments that showed that 54.55% graduates did not feel ready for industry, but rather had *the minimal basics that you need to survive* (response 221). In addition, Graduate Recruitment Officers concurred that graduates are usually not ready for industry, resulting in their hiring based on "cultural fit" and having moulding procedures in place.

Contribution:

This finding has theoretical importance. Throughout this study, literature arguing a gap between industry and academia was stressed, however, with the exception of Brown et al. (2008), these findings were all international studies. This finding confirms that a gap between industry expectations and academic output exists in the South African context.

9.3.3 Finding: Credentials come second to the Honours Experience

Discussion:

Section 8.2.3 presented arguments that showed that 63.64% of graduates stressed the need to complete the honours year. None of the respondents valued the title of "Honours graduate", but rather valued the experiences they had in the honours year. Although Graduate Recruitment Officers were not explicitly asked about the honours year, there was an indication that they prefer students who have done honours. In describing their reasons

for this preference, the additional experience and insight contributed value, and not the title or credential. This confirms the argument (explained in section 5.4) that in seeking credentials learners should guard against being output oriented, but rather focus on the process involved in gaining credentials, thereby acquiring the lifelong learning skills necessary to contend with the nature of the field.

Contribution:

This finding has theoretical and practical importance. Practically, it can serve as motivation for 3rd year students contemplating the value of the honours year. Theoretically, it could also serve as evidence against the value of a credentialist mindset as students and employers valued experiences involved in getting credentials, rather than credentials themselves.

9.4 Contribution of Findings for Research Question Three

As discussed in Chapter 7, this research question (Is there a relationship between group experiences and career trajectory?) was focused on assessing the role teamwork could play in shaping a student's specialisation. The findings were found inductively through categorising reflective accounts from graduates.

9.4.1 Finding: Teamwork is Important – It enhances Realism

Discussion:

Whilst the intention of this research question was to assess the effect of teamwork on students' competency development and specialisation, there was a noteworthy amount of evidence suggesting the importance of teamwork. Section 8.3.1 presented arguments that suggested that teamwork, and having to work with others, instilled a sense of realism. That was stressed as important in sections 9.1.2 and 9.2.1, regarded as necessary to expose students to situations that could not be replicated in theoretical case studies. There was evidence of a danger in isolation as the realism resulted in both positive and negative experiences. It was found that teamwork created situations of conflict, tensions, as well as motivation, energy, confidence and confirmation drawn from team mates.

Contribution:

This finding has theoretical and practical importance. Practically, it can serve as a justification for the use of teamwork as an intervention or catalyst that can help enhance the existential experience of being in touch with Reality. Theoretically, it offers new insight into the value of team work. Further research could be conducted into the effects of team work.

9.4.2 Finding: The First Project Experience acts as a Metaphorical Fork in the Road

Discussion:

Ample evidence was presented in section 8.3.2 that showed that learners switched roles, or went deeper into roles during their third-year project experience. Raelin (2007) argued that learners are unlikely to change without provocation. This finding argued that teamwork is the provocation for learners to choose a role, thereby confirming Dreyfus' (1999) special or identity forming commitment that embodies their whole being. This is a part of finding oneself in preparation for industry.

Contribution:

This finding has practical and theoretical importance. Practically, it could serve as justification for making learners choose specialisations, thereby both resulting in their realisation of their dislike for the specialisation and choosing another, or forming an identity around it. Theoretically this event, the first project experience has been identified as a metaphorical fork in the road of competence development. This could be the subject of further research.

9.4.3 Finding: Further Research could be conducted into Role Movement

Discussion:

While the previous finding was focused on teamwork acting as fork forcing students into roles, there was no evidence or expression of any bullying into roles. This finding highlighted a need for research to be conducted into role movement. As presented in section 8.3.3, there was a significant amount of movement and contention around the development role. A shortage of females was also highlighted.

Contribution:

This finding has theoretical importance. It was not the intention of this research to assess perceptions of roles, changes in roles, or possible gender discrimination. However, the identification of this movement could be the subject of further research.

9.5 Limitations

The researcher registered at the University of Cape Town in 2005 and completed the third year Information Systems course in 2008. He completed his honours in 2010. He sponsored and supervised, a third-year level project in 2009 and tutored on the third-year level course from 2009 through to 2011. He then became a junior lecturer and was involved in the course in a lecturing capacity in 2012 and a supportive capacity in 2013. The researcher therefore had personal involvement with the sample under investigation.

As a result of this, the researcher's personal perspectives might have influenced interpretation of reflective accounts of graduates. In addition the diverse nature of South Africa, that has 11 official languages, impacted on the results of the study. This meant that graduates expressed themselves differently and their meaning had to be interpreted. Literature suggests that interpretive research starts with an understanding that "prejudice is a necessary starting point of our understanding" (Klein & Myers, 1999, p. 77). Orlikowski and Baroudi (1991, p. 13) concur, arguing that interpretive research is "incapable of being understood independently of the social actors (including the researchers) who construct and make sense of reality." In addition, Raelin (2007, p497) argued that "we can't compare our views of the world to the world as if it exists independently of our views." Walsham's (2006, p. 320) concurs, stating that "our theories concerning reality are ways of making sense of the world, and shared meanings are a form of inter-subjectivity rather than objectivity." To ensure rigour and objectivity, or Walsham's "inter-subjectivity", the researcher built the theoretical framework and worked from a rigorous study of literature. All claims and findings were also linked to existing studies in literature.

In addition to the limitations expressed, as a result of having an interpretive philosophy and being personally involved, the researcher notes the lack of value derived from questions 15 and 16 of the graduate interviews. These questions were designed to draw out the graduate reliance on tools and methodologies, thereby enabling the researcher to assess their adaptability to different circumstances and their reliance on guidelines. Unfortunately, no valuable insight could be induced from these questions. In addition, the researcher would also like to acknowledge the concern raised around the limitations, or exclusions, expressed in section 9.3.3. Further research could be conducted into perceptions of roles, possible bullying of students into roles, movement away from development, and possible gender discrimination.

9.6 Final Remarks

As Schön (1983, p. 40) emphasised: real-world problems "do not present themselves as givens." The fluid, ever changing and diverse nature of the IS field has been a defining characteristic throughout its history. Perhaps, in seeking to participate in this field, one should not seek a standard and blindly conform to it. Rather, those who seek to become IS practitioners should seek to make a commitment, with King and Lyytinen's (2003) bold intellectual reach, to the adventurous journey of exploring the multitude of conflicting ideologies, thereby growing with the field. One should seek Candy's (1991, p391) "climate of self-direction and inquiry", thereby making a commitment to arm oneself with the existential characteristics necessary to change. Through intentionally placing oneself in different circumstances and different conditions, one will face Dreyfus' (1999) danger and harsh reality of existence, thereby being humbled, inspecting and adapting to different circumstances and conditions while acting as a pioneer on an existential journey toward competence. Spiral out, keep going.

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Appendix A – Interview Questions - Graduates

1. When did you start working?
2. When did you do your third year at UCT?
3. Which areas (if any) were you competent in before that year?
4. Which areas did you prioritise for your development?
5. What made you choose to focus on those areas?
6. Can you share 2 – 3 experiences at least of the 3rd year that have shaped and influenced your career and development? These experiences could be social as well.
7. Is there a trajectory (route) of development into which the third year project launched you?
8. Do you feel the foundation given to you by your third year was adequate enough for you to start in industry? Also, please describe your development after you left UCT.
9. Can you identify a specific experiences or events that have aided your development significantly?
10. In the history of your career, what was the biggest responsibility given to you?
11. How do you think you performed?
12. What did you take away from that responsibility?
13. In the area in which you are specialising, how would you describe your competence? Can you motivate your answer?
14. In the history of your development, what are your most valued tools, concepts or methodologies?
15. What are your most valued tools, concepts and methodologies at the moment? Those practiced most frequently.
16. How reliant are you on the items mentioned above?
17. Do you recall an event during your development where you failed to meet the requirements for a task?
18. If the task were to present itself again, would you attempt it again? If not why? If so, what would you do differently to ensure success?
19. Do you feel being asked to reflect on past experiences and or events helps in your development?

Appendix B – Interview Questions – Graduate Recruitment Officers

1. What incentives/interventions do you give your fresh graduates to embrace the organisational culture?
2. Do you offer any ownership of work or offer equity?
    a. If yes - does this help with motivation?
    b. If no- why not?
3. Can you briefly contrast the mindset of a final year university student to what you expect/want from your fresh graduate? What are/have been the issues/stumbling blocks in moving students between those two mindsets?
4. Do you observe an increased sense of pride and commitment after the graduate has completed their first few tasks?
5. In the initial phases of the program, are students timid/hesitant in their first interaction with clients? E.g. would they prefer to deal with internal projects rather? Do they want to follow more senior staff? Do they want to be "thrown into the deep end?"
    a. How would you deal with any timidity/hesitation?
    b. If no, how often has this confidence translated into success?
6. After completion of interactions with clients do you observe an increased sense of confidence in graduates?
7. Is there any 'free time' allocated? Time where graduates can work on their own projects and thereby bring new ideas/insight into the company?
    a. If yes, are graduates more excited about this time?
    b. Have these initiatives produced useful outcomes?
8. After having completed your recruitment drive, do you assume the students will fit into your company or do you have moulding procedures in place?
9. What level of mentorship do you provide your graduates? Do graduates get allocated mentors or do you allocated mentors retrospectively when expectations are not met?
10. What feedback mechanisms are in place? Is this feedback just a formality or does it result in changes in behaviour?

Appendix C – Interview Responses by Category

Relevant to Section 8.1.1

Table 13 : Psychological Ownership Responses

Psychological Ownership			
Response Number	**Respondent ID**	**Statement**	**Question Number**
2	MSC2006DD5	I guess knowing that I wanted to be the team leader the following year I knew it was very important that I develop those skills and sort of ironed out the kinks in third year so that I would be primed for the honours year.	5
3	MSC2006DD5	I definitely learned that **people function better when they are working on their passions as opposed to just being made to work on things that they are seen as good at**. So for instance I tried to encourage with our team that people would express what it was that they really wanted to spend time working on and that they actually work on those things that they are passionate about Where I find that their learning ability is a lot higher, their agility their ability to absorb quickly and grow in that area of work, that was definitely one of the things that I learned.	6
5	DV2006RL4.5	Working in a team was key to career development - especially learning to **manage one's self** and others to a tight deadline where expectations may not always be realistic. Working in close proximity with a few people quite accurately mirrors life on client projects.	6
6	DV2006RL4.5	I'm never afraid to try something I don't know otherwise I will never grow.	18
15	PM2006FC4.5	1. My team members. I worked with competent people and they were just as passionate in the work as I was. 2. My interaction with the lecturers, particularly Elsje Scott who was fundamental in my career development. 3. Being team leader for the systems development project. That ensured that I was on the ball regarding the project and that everything was addressed and on time.	6
18	DV2006MS3.5	I also found that I had an affinity for programming during the crunch phase of the project. The closer it got to implementation the more focused I became on the development side of things.	6
19	DV2006MS3.5	I am extremely passionate about what I do and I feel that that is to my advantage, but my lack of years of experience often balances that out. Moving from my first job to my second (current) job was a very big change in terms of development methodology and tools, etc., which is why I feel that I am still just getting started.	13

21	PM2007IS3.5	I developed myself probably the software side, sort of where you need to deal with business, understanding business processes, interpreting that and changing that into technical requirements, that's where I wanted to develop myself.	4
23	PM2007IS3.5	Things I did to develop myself its really everyday work experience and everything you do is very unpredictable and different, the people you meet the clients you interact with, everyday interactions where as your university education gave you the basic framework, everything after that is a learning curve.	8
24	PM2007IS3.5	I have gained doing multiple things at once, having multiple responsibilities to deal with, from managing my own responsibilities to delegating to others and at the same time to deal with issues that are not very easy to plan before because it could be anything when you are with a client.	12
27	MSC2007ME3	I built this cycling website, and I think I finished it in matric and got it online and that just exposed me to a lot of real-world problems that we spoke about in IS about back-ups and redundancy and mission critical applications and managing change and managing user change and at that stage I did not realise I was in my year in matric or my first year at UCT that I was getting some practical experience just kind of stumbling across a lot of these things and then when we spoke about it in lectures and the theory behind it really came true that, hold on I have seen this over there or I have done something like that or I had done that wrong so it was really valuable, I think that.	9
32	BA2007SV4	Yes - it's good to learn from past experiences and to see if you are able to re-apply the knowledge that you've gained, in a practical manner. Being a reflector, I like to evaluate the lessons learned from my previous activities / projects and I am to continuously improve.	19
34	PM2007DR4.5	I think it just builds that intrinsic characteristic of just being willing to work hard and put in hours and figure things out and realizing that it's not always a quick answer, I think that prepares you to go into the work force because working in IS that's what you really need. You need to **have that personality trait, that characteristic of being willing to also work on things and investigate and work things out**. So I think third year is good but an honours is definitely better.	8
35	PM2007DR4.5	Things I think definitely experience comes into play, you learn from your mistakes and you learn from other people's mistakes. You chat to people and find out what did they struggle with, what would they do differently next time and you take their advice and a different situation is not going to happen to me type of thing so definitely experience plays a huge part in honing the skills.	8

41	BA2007RI3.5	The Project is so important because you sort of have to use those practices and make your own.	9
43	BA2007JS3	Well obviously our third year project, it was a huge defining factor in my career, just the exposure to interacting with clients and building the project from the ground up, working in a close team environment and creating something for me was just **a great experience**, a fun experience and just kind of validated the choice I had made in my university degree and just kind of from that point onwards the role I was playing in varsity is the role I wanted to be playing in the working world, because it felt like a role that could be continued.	6
45	BA2007JS3	I think I have learned more about what I want to do in my career taking it from this responsibility, so in that meaning that I do want to work on development teams, I am not so much somebody who wants to do the process side of business analysis so there is that, that there is still a lot that I need to learn in terms of working with people and hopefully leading people that's a whole other skills set, one that we don't learn in varsity but one that comes with time.	12
46	BA2007JS3	I think my competence in terms of project management is that I am still in BSG terminology, a manager of self and I am still stretching to learn how to be a manager of others, which is where the project management comes into play.	13
49	PM2007KM4	Of my third year I suppose it's the group dynamics and the group projects so in third year I realised that as much as it was an area that I enjoyed, I wanted to work more with people so third year was the first time I went out and worked with a real business problem so we worked with the Sports Science Institute of South Africa so I can list the entire relationship, the going there, the requirements and state where really good I loved that yeah, so that was when I really decided to make a choice of being involved in that process or just being a developer and I realised I was more inclined to working with people and doing consulting rather than going into dev.	6
56	QA2008YT5	I would say my gut feel... I feel that uhm... I am born with the ability to see things that other people don't see and I seem to be doing fine without any further training and I have proved myself to be 80% correct and I realised this when I did advanced training about 2 months ago and I realised I see things without them needing to train me and I already know	14

58	QA2008JM3	I am not working for free anymore so how else have I developed? Managing myself, my career path, in UCT everything is laid out for you in terms of what you need to do, you know what you need to do in terms of the next week, the next month, and the next semester. In working, those rules or guidelines are not stipulated you are very much guided down your own path of what you want to pursue and what you are interested in.	8
61	QA2008AR3	After UCT stuff made a lot more sense suddenly, once you actually get thrown into the environment where all the stuff that we learned is applied, it makes a lot more sense and how I have developed since then is through reading international blogs.	8
64	MSC2008CA3	I think it was more gradual than one specific thing, so as you go along you learn stuff, it's not like you get one big course at the start where you get to learn everything as you are working you pick up different skills and different knowledge areas of the whole business so there was not one specific thing, it's as you go along you pick up things and you take on new stuff you learn something new so it's more like a process of learning.	9
66	MSC2008JG3	I think the thing is that each time or each project that comes along you have to change who you are to be able to work on the project that you are working with. I mean we have had various projects, I have had various projects where me personally have had to change the way that I approach A the client, B the work that I am doing, and C how I get it done purely for the reasoning behind why the project is there in the first place. So making sure that something gets done might mean that you have to change how you work and that has definitely influenced who I am. I can't say I am better off or worse, but I can say that has happened three or four times in the last year. Each major project having its own kind of way of being and me as a person having to make sure that I conform to the requirements that are needed.	9
70	DV2008AO3.5	I think the main thing that shaped my career and my development was the third year, working on a real-life project, having to go out, find a client someone to work for, getting business requirements from them, doing the whole thing from scratch and doing it all ourselves as a team and then having to just create this system on our own. It was a **huge learning curve** and we had to **mostly self-teach** ourselves majority of the stuff, specially as far as the development is concerned in fact more so with the development not so much the analysis so yeah lots of learning and very challenging and I think working on a team was also, the actual team work, slotting into roles, everyone finding their comfort zone and what they were good at and also being on such an ambitious team where everyone was pushing themselves, pushing each other.	6
72	DV2008AO3.5	It was **sort of my baby** and I **learned a lot through that**.	10

76	BA2008NN3.5	When I started, my hand was literally held as I was guided in the "swimming pool" of the working world. Over time, I was entrusted to make decisions on my own without always running it past my seniors or management and that is when I began to blossom and grow more and more in confidence. In my second year, I was assigned a protégé who has also grown in his own right.	13
78	DV2008PK2.5	We were able to branch out to c# by ourselves in our own private time, I did a lot of java coding and the theoretical foundation that we got in our third year helped with all of that. [dev out of UCT] I do a lot of coding in my own time after hours, I also read a lot about what is going on in the industry.	8
81	DV2008MK3	IS third year project ownership, the project is **owned by the student** all the way to the Expo.	9
84	DV2009OL2.5	I got very ill in my 3rd year. Being so far away from home this was not easy. The work load for the year was also very large and so it was difficult to give my illness the kind of attention it needed. It was also tough explaining to lecturers that you are unable to deliver to their expectations simply because you are ill and not because you are incapable. It taught me to learn to take care of myself even when under pressure. Ultimately my illness is the type that could have been avoided had I given it attention early enough, but I ignored the symptoms simply because I could not afford to be ill at such a crucial time in my studies.	6
89	BA2009II3	The **power of unstructured and creative thinking and that there isn't a written solution**, there isn't a play book for coming up with solutions especially when you are trying to innovate and feel and trying to get competitive advantage. A lot of the times it's saying its working on what an objective is, if for example our objective was how to get more clients, you look at your own internal data and what you currently have, so I think it's mostly unstructured thinking.	12
90	BA2009II3	A big part of even the way we have developed from third year to honours it like being able to inspect and adapt so you know where the pain points are going to be and if you are honest enough with yourself and being retrospective and saying, we failed here and this is why we failed, it's a good way for you to come up with those actions that are going to prevent you from doing that in future so failure is always a recipe for you to succeed a second time.	18

95	DV2009PR2.5	Something that I learned is that it's really hard to motivate yourself it obviously depends from person to person but personally it's essential that I work in an environment that a lot of people are dependent on the work that I do, and I am responsible for delivering something because just freelancing you just sit there and you feel like having coffee, or I am just hungry and I will just drive down to the shop and buy something quick and yeah that impacts your productivity and that impacts your effectiveness as well, because your motivation is kind of low and when you hit a heavy problem you think oh well I will sort that out later or you think uh this is you solve the problem in a way and you think it's not that great but it's good enough that's the sort of working from home mentality that sort of dulls you in your efficiency and I definitely think that working in a big structured organisation is necessary to get you the right kind of exposure.	12
99	BA2009KN3	I think the gap between varsity and working is huge, but I mean with the number of hours during tutorials it kept me in good shape because here I know when we start a sprint like we have this amount of work, you don't just sit on a task and just say ok this is what is assigned to me so its ok as long as our task lets us move everything we pretty much learn everything.	9
102	PM2009MA3.5	I needed honours behind my name definitely and I don't think I was ready to leave and I think our honours project was a huge learning curve for me anyway. It's a shock to your system hitting the working world because no matter how hard you worked in fourth year it's not going to compare to every single day of your life coming back and working. I think it's just every single day you develop because every single day people expect a lot of you, I mean for me it was slightly different because most people are part of one team that is working on a project and they learn that entire product and about the pressures of that team whereas I came in and here and they sort of wanted me to know a bit of every single product in the company. So from that aspect it was bloody hard because a lot of the stuff I could not understand some of the projects are so huge that if you just sat on that one team you would take about 3 months so I felt a lot of pressure to learn very quickly and I think I learned to adapt very well to taking in a lot of information and understanding as much as I needed to, to complete my job. But, once I settled down in prop control I think it made a huge difference, and once you are getting responsibilities you also feel important and you feel that you have to complete it, you don't mind putting in that extra effort whereas at varsity there was not that I mean it's for marks and as much as people think it's a good system it's not really that great a system and I think the fact that it is yours and you need to get it done, drives you to excel.	8

107	QA2009MS2.5	I don't think it's a specific event. I think it's a culmination of everything that you get taught. It's not just a big bang thing that you get introduced to the world of IS. I went into IS knowing what it is about so if you speak to someone who possible did not understand what the world was about, they might have a big bang moment but I think what actually launched me into IS was the project we did in fourth year that was sort of I suppose that could be a catalyst for me wanting to do information systems in the first place, but it's pretty much a culmination of all the studies that you do.	9
110	DV2009AP3	Pretty much having to research a whole bunch of new technologies to use in our product, getting things to work just managing the team to get people to do what they want. To get them to work in time, handling group fights, I would say that's the social part of it but overall I would say it's just one crazy experience that I learned so many lessons from.	6
111	DV2009AP3	I researched more, did more projects, got involved in more programming communities it pretty much comes down to practice and trying out new stuff. You have kind of got this, I kind of know what's going on, I just kind of need to figure out what are the tools that I need to use for the job and how they work.	8
116	DV2009JP3	Definitely **self-learning is a core value** that I sort of abide by. I think it's very useful in developing yourself.	19
121	BA2009SL2.5	I think the biggest one to date is managing my own career because it's a bit daunting to realise your own career is in your own hands and it's up to you how you progress from here on.	10
123	BA2009RS2	I think our third year systems development project was definitely like a big driver of my development although it was very structured and we had support systems and we had a lot of scaffolding around us it was like us in a way being in to, not the deep end, not the shallow end but sort of the middle end. We had to **work things out** for ourselves and **fend** for ourselves a bit and I think that really gave me my first real taste of real world IS project, like real world analysis, you know coming into an organisation that you don't know anything about and having to learn what they do, how they do it, how can we irove things.	6

126	DV2009BM2	The main thing is third year is a working course and I realised after two years that my coding skills were very limited and the main thing it taught me is how to Google and how to learn so at the start of the project, I realised I didn't know much but constantly going on Google and learning how to do what was required was probably the greatest learning curve of that course and probably one of the best lessons I could have had. The other thing is that it was the first long group project so how to work with group members it was the first time I had worked with more than one person for any extended period of time. I had been working for 5 people for a whole year, you learn a lot about team dynamics.	6
134	DV2010KD1.5	Truthfully no, **if we had not gone out and taught ourselves what we had needed for our project, we would not have been in any way qualified to start in industry**.	8
136	DV2010RP2	We aimed to expand our knowledge base and try and work with as many projects in as many different areas in our project so we integrated with hardware which was quite fun. We basically focused on project management methodologies and tools as a whole and we delved into doing some proper projects because up until then we had been doing windows form based and web based is a totally different realm.	4

Relevant to Section 8.1.2

Table 14 : Being in Touch with Reality Responses

Being in Touch with Reality			
Response Number	**Respondent ID**	**Statement**	**Question Number**
5	DV2006RL4.5	Working in a team was key to career development - especially learning to manage oneself and others to a tight deadline where expectations may not always be realistic. Working in close proximity with a few people quite accurately mirrors life on client projects.	6
8	DV2006SM4	I think the actual third-year project was a really good experience like it was good to work in a team with people who had different strengths and weaknesses. So that provided good exposure to project management it also gave me the opportunity to actually write code a work in a very real life scenario with a sponsor outside of campus, so it was a really good experience, quite challenging as well.	6
10	DV2006SM4	if you have a solid plan that is not very flexible you are not going to do very well so yeah, and also just willing to learn and get stuck in and accept challenges I guess.	14
13	PM2006GA6	I could share the experiences of working in teams and under pressure which was invaluable to being able to almost handpick from a host of job offers after graduating.	6

15	PM2006FC4.5	1. My team members. I worked with competent people and they were just as passionate in the work as I was. 2. My interaction with the lecturers, particularly Elsje Scott who was fundamental in my career development. 3. Being team leader for the systems development project. That ensured that I was on the ball regarding the project and that everything was addressed and on time.	6
17	DV2006MS3.5	Learning to work so closely with others in a team over such an extended period of time greatly helped in preparing me for work in the real world more than any other experience at UCT.	6
22	PM2007IS3.5	It helped to further grow me and understand things, but not really to launch me in any particular direction.	7
27	MSC2007ME3	I built this cycling website, and I think I finished it in matric and got it online and that just exposed me to a lot of real-world problems that we spoke about in IS about back-ups and redundancy and mission critical applications and managing change and managing user change and at that stage I did not realise I was in my year in matric or my first year at UCT that I was getting some practical experience just kind of stumbling across a lot of these things and then when we spoke about it in lectures and the theory behind it, it really really came true that, hold on I have seen this over there, or I have done something like that or I had done that wrong, so it was really valuable. I think that.	9
30	BA2007SV4	Practical application whilst learning.	9
31	BA2007SV4	Nothing beats hard work.	12
33	PM2007DR4.5	I assumed I was strong in analysis, you realise a bit later when you start working that you have got **lots to learn**.	3
35	PM2007DR4.5	Things I think definitely experience comes into play, you learn from your mistakes and you learn from other people's mistakes. You chat to people and find out what did they struggle with, what would they do differently next time and you take their advice and a different situation is not going to happen to me type of thing. So definitely, experience plays a huge part in honing the skills.	8
36	PM2007DR4.5	There is definitely an element of stuff you are never going to know unless you actually **jump in and get experience**.	12
39	PM2007AD5	I was the project manager of the team so it was more to do with managing the team, it is something that I am not used to doing if you come from comp sci you normally are the coder, the guy who is developing everything and now you move to more of a management role so gaining that experience, dealing with people in a more intense level and managing people was something that I had not experienced before, but definitely gained a lot of experience during the year.	6
44	BA2007JS3	Oh yes, in third year, we as a team, and me in particular, we found third year the most career defining year we found honours to be a breeze after third year, it was a steep learning curve to go from the theoretical project world into a client world and we had a stakeholder where we had to dress up	8

		and go to the client and validate requirements and all of that jazz, so it really was a huge step up for us so yeah, definitely third year was bigger than honours for us.	
45	BA2007JS3	I think I have learned more about what I want to do in my career taking it from this responsibility, so in that meaning that I do want to work on development teams, I am not so much somebody who wants to do the process side of business analysis so there is that, that there is still a lot that I need to learn in terms of working with people and hopefully leading people. That's a whole other skills set, one that we don't learn in varsity but one that comes with time.	12
50	PM2007KM4	That things will go wrong frankly and you have to deal with it. So I think a lot of the time when you take on responsibility you always feel like you have to, everything has to go perfectly to say well you think that you have to have done everything perfectly but the truth is things will go badly and the more important thing is how you react to changes, changes in scope, changes in budget issues on your go live day so it's about being flexible.	12
52	MSC2007WW3.5	The third year 'development project' required that I mature quickly. It was the first time **the academic and conceptual became tangible.**	6
53	MSC2007WW3.5	**I initially thought that I had the skills and the resources to fulfil the role comfortably; however I learnt very quickly that it takes more than an individual's performance to fulfil a role. There are so many exogenous factors that come into play and you soon realise the smooth completion of a task is the exception rule and not the norm.**	12
58	QA2008JM3	I am not working for free anymore so how else have I developed? Managing myself, my career path, in UCT everything is laid out for you in terms of what you need to do, you know what you need to do in terms of the next week, the next month, and the next semester. In working, those rules or guidelines are not stipulated you are very much guided down your own path of what you want to pursue and what you are interested in.	8
59	QA2008JM3	In general it was a lot to take on, but I am glad I did because being thrown into the deep end it's the quickest way to learn and I think I have done pretty well and I have taken the bull by the horns.	11
61	QA2008AR3	After UCT stuff made a lot more sense suddenly, once you actually get thrown into the environment where all the stuff that we learned is applied it makes a lot more sense and how I have developed since then is through reading international blogs.	8
67	MSC2008JG3	To meet some clients and I think that is the largest responsibility that I have had because I have not only my own responsibility and my own background, but I am also carrying that of [Company]. I mean they are sending someone who is going to put their left foot forward and not mess things up.	10

70	DV2008AO3.5	**I think the main thing that shaped my career and my development was the third year, working on a real-life project, having to go out, find a client, someone to work for, getting business requirements from them, doing the whole thing from scratch, and doing it all ourselves as a team and then having to just create this system on our own. It was a huge learning curve** and we had to mostly self-teach ourselves the majority of the stuff especially as far as the development is concerned. In fact more so with the development not so much the analysis so yeah lots of learning and very challenging and I think working on a team was also, the actual team work, slotting into roles, everyone finding their comfort zone and what they were good at and also being on such an ambitious team where everyone was pushing themselves, pushing each other.	6
75	BA2008NN3.5	When I started working, I was thrown into the deep end and I coped quite well. It wasn't just 3rd year that helped me; it was my UCT experience in its entirety that fully equipped me to take on tasks at hand, deliver as expected, commit to excellence and go above and beyond the call of duty.	8
87	BA2009II3	They actually asked us to present to the IT Department and we gained that experience of showing a working system to an IT Department that is responsible for an entire province and seeing them engage and react **in a way that is far beyond academia, it's not just a fancy prototype but something that could actually work in the real world. It gives it a sort of realism that is quite engaging.**	6
89	BA2009II3	The power of unstructured and creative thinking and that there isn't a written solution, there isn't a play book for coming up with solutions especially when you are trying to innovate and feel, and trying to get competitive advantage a lot of the times, its saying it's working on what an objective is, if for example our objective was how to get more clients, you look at your own internal data and what you currently have, so I think it's mostly unstructured thinking.	12
94	DV2009PR2.5	Now that I got my new job, it's only been three weeks but I have learned a lot of stuff and getting input from lots of different people and seeing how big systems work because up until now, I have only worked with prototype systems so you build a little thing and you think it's pretty cool but if you actually had to implement it, it **would all fall apart** but seeing how people do it on a really high end scale and working with big numbers and a big process and big architecture, that's really opened my eyes to seeing **how things are actually done in the real world.**	9
97	DV2009PR2.5	It does not matter how much you learn or how much you study, you actually have to use it in practice because that's just the nature of it. If someone tells you have to get onto the bike and you have to peddle and you have to do this, **you can talk about it as much as you want but unless you actually go and ride a bike you wouldn't know what is going on and you**	G

		might fall a lot despite all the knowledge you have. You will probably fall a few times so I think the UCT course is good in the way it is done because you have to actually build something for 2 years before you actually go and that actually helps a lot in the interviews.	
99	BA2009KN3	I think the gap between varsity and working is huge, but I mean with the number of hours during tutorials it kept me in good shape because here I know when we start a sprint like we have this amount of work, you don't just sit on a task and just say ok this is what is assigned to me, so its ok as long as our task lets us move everything we pretty much learn everything.	9
102	PM2009MA3.5	I needed honours behind my name definitely and I don't think I was ready to leave and I think our honours project was a huge learning curve for me anyway. It's a shock to your system hitting the working world because no matter how hard you worked in fourth year, it's not going to compare to every single day of your life coming back and working. I think it's just every single day you develop because every single day people expect a lot of you. I mean for me it was slightly different because most people are part of one team that is working on a project and they learn that entire product and about the pressures of that team, whereas I came in and here they sort of wanted me to know a bit of every single product in the company. So from that aspect it was bloody hard because a lot of the stuff I could not understand some of the projects are so huge that if you just sat on that one team you would take about 3 months so I felt a lot of pressure to learn very quickly and I think I learned to adapt very well to taking in a lot of information and understanding as much as I needed to, to complete my job. But once I settled down in prop control, I think it made a huge difference, and once you are getting responsibilities you also feel important and you feel that you have to complete it, you don't mind putting in that extra effort whereas at varsity there was not that. I mean it's for marks and as much as people think it's a good system it's not really that great a system and I think the fact that it is yours and you need to get it done, drives you to excel.	8
106	QA2009MS2.5	After I left UCT it's pretty much **a baptism of fire**, you have got to get out there, you have got to get a job, you have got to speak to people, you have got to be confident in what you do, it's the actual acquisition of the job. Then once you actually hit that job, you have got to use the skills and tools you learned at UCT and probably one of the most fundamental things that they teach you is hard work and a sort of basic intelligence and framework with which you can build your career.	8
108	QA2009MS2.5	You don't teach someone to drive unless you put them in a car so that's the issue I had. Processes like that can and should be changed.	18

112	DV2009AP3	I would say third year IS. That was pretty much it. That is being **thrown into the deep end** and if you want to make it out on top you have just got to get to the next level.	9
114	DV2009AP3	Medical doctors have a way of following things, pretty much you kind of have to work on your feet, you kind of have to think on your feet and what's the best way to get this done.	G
118	DV2009LG2.5	So, you pick up on how to work with real-life situations and what it is really like to work in a team other than that you are pretty well prepared in that sense for how it's going to be. You do understand a lot but obviously the problems are completely different but it's the same structure in place.	8
120	BA2009SL2.5	I probably, think ever since I started working, what was probably the most developed skill was communication and interaction because most of the time I am interacting with users and developers and stuff. It has definitely improved, I had it before but it has gotten better because I have to use it.	8
123	BA2009RS2	I think our third year systems development project was definitely like a big driver of my development, although it was very structured and we had support systems and we had a lot of scaffolding around us it was like us in a way being in to, not the deep end, not the shallow end but sort of the middle end. We had to work things out for ourselves and fend for ourselves a bit and I think that really gave me my **first real taste of real-world IS project**, like real-world analysis, you know coming into an organisation that you don't know anything about and having to learn what they do, how they do it, how can we improve things.	6
125	BA2009RS2	I think for something like IS, I know I talked about it, I just need to really stress that giving students or making students jump into a real-world situation like the third-year project or fourth-year project is hugely important like a huge part of the course that really helps and I definitely would never want to scrap those.	G
128	DV2009BM2	I have only been given one project at work so I guess it would be that one. At UCT there is not too much responsibility at some point not working you **take out that piece of functionality**, but **sometimes your system goes live but in general it doesn't**. So if your marks do become the primary driving force of what you put in, you don't get bogged down by small things you just change what you do. So from a UCT perspective there was not too much responsibility. From work I guess I spent quite a lot of time on the project I was on, so if I did not meet the deadline it would have come down on me.	12
131	BA2009JS2.5	I need testing to be a larger part of my approach, what I also took away was pro-activeness in attention to detail so in terms of your analysis in terms of your project management, in terms of generally in the working environment, I think attention to detail is something that we don't necessarily do by default and I needed to be more pro-active in getting attention to detail.	12

133	DV2010KD1.5	The one experience was not quite just one event but it was the experience of being able to work in an office and this enabled us to see what office life is like and it also gave us the opportunity to get help from people in the industry and to see where we were at the stage of being third year. Another one was I suppose how to deal with group confrontations and conflicts. There is no real just one even but throughout we were able to come together and work past any problems and that sort of thing. The third one I suppose would be the social side even though we were working as a team we were still able to interact sociably as friends outside of the project.	6
138	DV2010RP2	One of the things was having to deal with a team member who happened to decide that working for us was not a good idea. He pretty much used his girlfriend as an excuse as to why he had to go home and trying to deal with that conflict management and trying to say but hang on, we need to do it this way or we need to do it that way and not your way because your way is stupid, but no it will work, it will work great but they will laugh at us and we ended up having lots of those little fights. That was one of the experiences. The other was just getting used to working solidly and hard like because third year was my first year where I honestly spent 12 to 15 hours a day just coding straight and it was just a mind f**k... oh f**k... so yeah just having to realise to hang on there are no tutors that I can go to there are no people that I can go ask for experience, so you learn to use these forums and learn to self-research a lot and that's the biggest thing that I took out of third year was about 2 or 3 experiences, I hope.	6
140	DV2010BB1.5	It's always a big change going from the studying to the working so besides adjusting from the 9 to 6 hours is having to just be a lot more professional in the way that you conduct yourself and the people around you. A lot of expectations, and if you say you are going to do something you make sure you do it. It's a lot different.	8

Relevant to Section 8.1.3

Table 15 : Reflection Responses

Reflection			
Response Number	**Respondent ID**	**Statement**	**Question Number**
1	DV2006HL4.5	I would think so yes because we have to learn from our mistakes: success and failures. If it's successful we can do it again, if something fails we can know not to do it again.	19
4	MSC2006DD5	I will make a lot of mistakes but as long as I am looking back continuously on my decision, I am at least able to pick up my learnings from any mistakes and employ them in my future plans and endeavours.	19

7	DV2006RL4.5	Yes, particularly how Scrum implements retrospectives. If you don't look back, you end up repeating the same mistakes in the future, which is no fun for anyone involved.	19
11	DV2006SM4	I think using the learning from past experiences it would be, I would probably do a lot better now in terms of management.	18
12	DV2006SM4	Yeah definitely, I think doing it regularly definitely helps, it's always good to reflect so that you can learn and grow and move forward	19
14	PM2006GA6	Yes, I think a retro-respective outlook is always a valuable tool in learning from past mistakes and developing in areas of weakness.	19
16	PM2006FC4.5	Yes, it certainly does. It helps in the sense that you can see what you think you did wrong previously and going forward how you would attack it.	19
20	DV2006MS3.5	Yes.	19
25	PM2007IS3.5	Yeah I do because I think I learned a lot from university from all those courses and everything we did and a lot of times even now when I am working, I think about that and can relate it to my current work.	19
28	MSC2007ME3	Yeah definitely. Any kind of review process or reflection is crucial. You know at UCT I think we tried some of it within the team and mentors, but once I got into the working world and specifically at [Company] I realised how much of a component of general working life that is. Whether it's a weekly project team review or if it's a post-project team review or your own personal performance review on a six monthly basis. It kind of lets you identify where you have either done something really well and you can pat yourself on the back, or look back and think ooooh jeez I should actually have done that or I should be doing that. Without that feedback it's going to be quite difficult to grow and you are going to make the same mistakes over and over again.	19
32	BA2007SV4	Yes - it's good to learn from past experiences and to see if you are able to re-apply the knowledge that you've gained, in a practical manner. Being a reflector, I like to evaluate the lessons learned from my previous activities / projects and I am to continuously improve.	19
35	PM2007DR4.5	Things I think definitely experience comes into play, **you learn from your mistakes and you learn from other people's mistakes**. You chat to people and find out what did they struggle with, **what would they do differently next time** and you take their **advice** and a different situation is not going to happen to me type of thing. So definitely, experience plays a **huge part in honing the skills.**	8
37	PM2007DR4.5	Feedback can be in a number of ways, it can be from your boss telling you what he thinks about you, it can be from your team telling you about how you are doing a good job or doing a bad job, and reflecting on that and putting it into action.	15
38	PM2007DR4.5	Reflection is extremely useful because not only does it point out your weakness, but it points out your strengths so you are	19

		able to know, further improve things that are going well, but you are also able to correct things that are not going well.	
40	PM2007AD5	Yeah, definitely. In order to grow you need to know where you have come from and you don't know what you have been through. You can't really go forward unless you have really known and got to grips with what you have been through.	19
42	BA2007RI3.5	I think, I mean with performance appraisals and we had that at university as well, kind of you reflect on yourself and you reflect on how you could improve things. Especially if you think in third year or fourth year you think you could definitely use that feedback in the next year and the same here at work when you are having appraisals.	19
47	BA2007JS3	Its nice, yes it does. It helps you know where you need to move, what you need to change, what you need to improve on, what works well, what doesn't.	19
51	PM2007KM4	Definitely. I think that is an **essential part of learning**, this is the personal opinion, we don't reflect enough on what was learned and without the reflection process you are just sort of going and not learning. And there is **a point where you step and look back and say how did it change, and how did you change as a response to that to make a difference?**	19
54	MSC2007WW3.5	Yes, as I have mentioned above many times failure is expected and reflection is required to truly learn from the experience. Reflection gives a **richer understanding** of the subject matter and underlying thought processes. Reflection forces you to examine the preceding steps and causes for failure or success. Understanding those steps and how they fit together will allow an individual to infer the outcomes of similar situations more effectively in the future.	19
57	QA2008YT5	Not really, but it does help me to look back and see how far I have come and what I learned from different experiences or companies and things I forgot long ago.	19
60	QA2008JM3	Yeah sure it does. I have not had to think about third year especially for a long time so it was interesting to go back to how much I have learned and where I am at the moment.	19
62	QA2008AR3	Definitely, it's always nice to think back to where you were and where you are now and how you did that, it's quite hard to remember these things. Specially the details, but very nice.	19
65	MSC2008CA3	Situationally it sometimes it does, sometimes it doesn't, because it depends on what you are reflecting on. So if its relevant to where I am now then it helps but if it, for example that analysis of what we studies would help me now but the coding now, I am not coding now so to reflect back on that now, would not really benefit me. So, yeah.	19

66	MSC2008JG3	I think the thing is that each time or **each project that comes along** you have to change who you are to be able to work on the project that you are working with. I mean we have had various projects, I have had various projects where me personally have had to change the way that I approach A the client, B the work that I am doing, and C how I get it done purely for the reasoning behind why the project is there in the first place. So making sure that something gets done might mean that you have to change how you work and that has definitely influenced who I am. I can't say I am better off or worse, but I can say that has happened three or four times in the last year. Each major project having its own kind of way of being and me as a person having to make sure that I conform to the requirements that are needed.	9
69	MSC2008JG3	Yes, definitely. I have always enjoyed a bit of reflective development purely because you can learn a lot from the past and a lot from history and talking about those things often brings up things that you might have forgotten or left in the past and actually using that information and remembering it, does help in future development.	19
70	DV2008AO3.5	**I think the main thing that shaped my career and my development was the third year, working on a real life project, having to go out and find a client, someone to work for, getting business requirements from them, doing the whole thing from scratch, and doing it all ourselves as a team and then having to just create this system on our own it was a huge learning curve and we had to mostly self-teach ourselves. The majority of the stuff, especially as far as the development is concerned in fact more so with the development not so much the analysis. So yeah, lots of learning and very challenging and I think working on a team was also, the actual teamwork, slotting into roles, everyone finding their comfort zone and what they were good at and also being on such an ambitious team where everyone was pushing themselves, pushing each other.**	6
73	DV2008AO3.5	Yeah, I think reflecting on your experiences does help in your development, sort of figuring out where, what worked, what didn't worked, what worked for me, so in future I can focus on those things. So yeah, I think it does.	19
77	BA2008NN3.5	**It depends. Sometime they're relevant and applicable. Sometimes they're like tampering with a healed wound that is best left sealed. I guess it's all relative to the issue at hand as well as the circumstances that would warrant such a reflection. It does not always have the desired effect** unfortunately.	19
79	DV2008PK2.5	Yeah it does, It helps you to know where you have come and where you have gone and also if you are aligned with what you are doing right and what you are doing wrong because you just go with the motions every day anyway.	19
80	BA2008LM3	Yes, I am able to look at things that might be flaws in my character which then influences the way I do my work	19

82	DV2008MK3	Yes it does, I can vividly see my mistakes in third year and also cherish the lessons learnt in that year.	19
83	BA2008MM2.5	Most certainly. It helps me pin down the reasons for success or failure and allows me to evaluate how to act in the future.	19
86	DV2009OL2.5	Yes. It gives you the value of hindsight because it is then that you realise how 'not bad' things actually were. You also take away from the past failures and improve on the successes.	19
90	BA2009II3	A big part of even the way we have developed from third year to honours it like being able to **inspect and adapt** so you know where the **pain points are going to be** and if you are **honest enough with yourself and being retrospective** and saying, we failed here and this is why we failed. It's a good way for you to come up with those actions that are going to prevent you from doing that in future so failure is always a recipe for you to succeed a second time.	18
91	BA2009II3	**I think the knowledge or knowing that you accomplished that before, it always got more difficult but you were always sort of able to come back and attack it and win and that always makes facing each challenge less scary.**	19
96	DV2009PR2.5	It definitely does because as you work day to day you don't always think back at what you have done to your foundations and what you have come from but when people start asking you question and you sort of have to think back and think. Yeah I sort of did that thing once and you can sort of spot something off and be reminded of something that you could use in your work now and yeah it also just sort of paints the picture again of where you are coming from and where you are going in the future.	19
100	BA2009KN3	It does.	19
103	PM2009MA3.5	Yes. It does. It is very important for you to review, you cannot decide where you are going if you don't know where you have come from and it's actually something that is possible because in the position that I am in I don't get reviewed enough.	19
105	QA2009LT3.5	It's very beneficial to go back and look at what happened and say that's what went wrong and look at ways to improve it. We do that as a team and we also have a fair review process involving one on one session with our team leader which also have helped me a great deal in improving as a tester and expanding my knowledge and ability. So yeah, definitely review is a big part of our job here and it definitely helps.	19
109	QA2009MS2.5	Yeah it does. I think some people require more formalisation in their process like what we do at SCRUM time here is just to ensure that you think about if from a corporate perspective. From an individual perspective I reflect all the time I don't need to be asked to. It's pretty much ingrained in me.	19
113	DV2009AP3	Yeah, I actually do it all the time because it helps. Like I said in one of the previous questions where one of the tools is experience, reflecting on that reminds you of the experience you had so you can use that in the current situation because if you have a problem you can think back and say oh ok I had something similar to this, how did we deal with it? How did	19

		that result? Obviously, if it did not turn out too well you won't do the same thing again.	
116	DV2009JP3	Definitely self-learning is a core value that I sort of abide by. I think it's very useful in developing yourself.	19
119	DV2009LG2.5	No, not really, **I don't think looking deeply into your past is really going to improve you, as long as you understand what you did wrong when you do it, you can improve that would be my view.**	19
122	BA2009SL2.5	Yes definitely, because if you don't look back you don't know how to plan for the future.	19
124	BA2009RS2	I think it does because it helps you sort of reconnect with what you enjoyed back then and also with what events and what tools and stuff you found helpful then its fresh in your mind and you think wait I did actually find this really useful and then realising that you actually really enjoyed this and that and can try that again.	19
129	DV2009BM2	Yeah definitely. I do think about when I finish a project, I think about what went wrong and what I can do differently for next time. Yeah I mean you can't move forward unless you look at what you messed up and what to continue doing. So yeah, reflection is very important.	19
132	BA2009JS2.5	Yes definitely, we do that as a process a little formally which kind of makes it a bit stale where we produce lessons learned a lot at the end of projects, etc. But I think in general yes, we have mentor check-ins and leadership check-ins with our line managers and a lot of that time is spent reflecting on what we have done and what we have learned from that. Particularly in your developmental stages. I definitely think I can learn a lot from the past and where I have failed and succeeded.	19
135	DV2010KD1.5	Yes, it does it helps you see where you have come from and how you have grown and where there is still room for improvement and change.	19
137	DV2010RP2	Being able to reflect does. But given the short space of time for this interview maybe not so much, but let's say reflecting does, well ok cool **what did I do wrong, what did I do right?** How could I have done those things better? Or could I have done them in a different way and could I have those things that I did right better and how? And yeah, and past experiences you can laugh at like we do.	19
141	DV2010BB1.5	Definitely I remember reflecting back at varsity. It's very important to look back at the mistakes or even the success you have had just to think about and what actually happened so in the future you can use your past experience to help in the future.	19

Relevant to Section 8.2.1

Table 16 : Analysis into Role of industry

Real Projects most fundamental?			
Response Number	**Respondent ID**	**Statement**	**Question Number**
52	MSC2007WW3.5	The third year 'development project' required that I mature quickly. It was the first time **the academic and conceptual became tangible.**	6
142	DV2006HL4.5	No statement.	8
143	MSC2006DD5	No statement.	8
142	DV2006RL4.5	Working in a team was key to career development - especially learning to manage one's self and others to a tight deadline where expectations may not always be realistic. Working in close proximity with a few people quite **accurately mirrors life on client projects**.	6
143	DV2006SM4	Gave me the opportunity to actually write code a work **in a very real life scenario with a sponsor outside of campus** so it was a really good experience, quite challenging as well.	6
144	PM2006GA6	The only one that stood out for me as a **make or break experience**.	6
145	PM2006FC4.5	No statement.	
146	DV2006MS3.5	Learning to work so closely with others in a team over such an extended period of time greatly helped in preparing me for work in the real world more than any other experience at UCT.	6
147	PM2007IS3.5	If I think of 3, maybe working on the group systems development project and first meeting with our sponsor that was quite, that influenced us a lot, first time we saw what it was like dealing with a business other things going to the imagine cup, that was quite an experience because you met talented people from all over the country."	6
148	MSC2007ME3	A vital requirement for a lot of the potential employers out there, you are working in generally some sort of project environment with teams and so yeah, it was kind of clear that it was one of the primary things.	5
149	BA2007SV4	Ability to work under pressure with fellow team members, through the ups and downs, and also to motivate the team to deliver against the planned targets.	6
150	PM2007DR4.5	Third year to me with information systems is a lot more demanding than third year in other projects, in other streams I can't really say that because I didn't do other streams but just based in holidays my friends were chilling and I was working I think it just builds that intrinsic characteristic of just being willing to work hard.	8
151	PM2007AD5	Purely from a business aspect, if you want to start a business one day you have to deal with the client and develop a client facing application and that was my aim to get experience.	5

152	BA2007RI3.5	Being in the third year you start being exposed to different companies and the career I have chosen is consulting and that is based on different companies coming and sharing what they do and also team building and companies sharing what they do in classes in third year.	6
153	BA2007JS3	Just the expose to interacting **with clients and building the project from the ground up**, working in a close team environment and creating something for me was just a great experience, a fun experience and just kind of validated the choice I had made in my university degree.	6
154	PM2007KM4	I suppose it's the group dynamics and the group projects so in third year I realised that as much as it was an area that I enjoyed, I wanted to work more with people so third year was the first time I went out and worked with a real business problem.	6
155	MSC2007WW3.5	The third year development project took something that was abstract and gave us an appreciation of how complex even the simplest IT solutions become when implemented in the real world.	6
156	QA2008YT5	I was focusing on CSS and HTML and I really enjoyed it and it seems like the team was happy to give me such a responsibility and they were happy with what I made and it pushed me in this direction because I was getting more confident from confirmations from others in the team.	6
157	QA2008JM3	I am not working for free anymore so how else have I developed? Managing myself, my career path, in UCT everything is laid out for you in terms of what you need to do, you know what you need to do in terms of the next week, the next month, and the next semester. In working those rules or guidelines are not stipulated you are very much guided down your own path of what you want to pursue and what you are interested.	8
158	QA2008AR3	No statement.	
159	MSC2008CA3	No statement.	
160	MSC2008JG3	Yeah, I think a lot of times when we went to go see the client, I was the person who was doing quite a lot of the talking in terms of client management, telling them what we had done what direction we wanted to go in.	6
161	DV2008AO3.5	I think the **main thing that shaped my career and my development** was the third year, working on a real life project, having to go out find a client, someone to work for, getting business requirements from them, doing the whole thing from scratch, and doing it all ourselves as a team and then having to just create this system on our own.	6
162	BA2008NN3.5	We were working out in Mouille Point and didn't realise that it was almost hand in time. Everyone suddenly panicked yet we had been calm and composed throughout the project cycle.	6
163	DV2008PK2.5	No statement.	
164	BA2008LM3	No statement.	
165	DV2008MK3	No statement.	

166	BA2008MM2.5	The foundation was adequate for learning initial lessons, but failing in those experiences knocked my confidence, and thus having an extra year to apply the lessons learnt successfully taught me how to confidently do things correctly.	8
167	DV2009OL2.5	I'm a sceptic at heart so I don't usually trust people with my work, I prefer to have full control of my work products and this project was proving difficult not only because it meant having to work with other people, but it meant having to work with people whose capabilities I did not fully know or trust.	6
168	BA2009II3	Seeing them engage and react in a way that is far beyond academia it's **not just a fancy prototype but something that could actually work in the real world** it gives it a sort of realism that is quite engaging.	6
169	DV2009PR2.5	I was very isolated and I had to learn lots of stuff by myself and I was not sure if I was going in the right direction and you don't always get input from other people saying look, I do this and it's hard to learn I have actually learned in the past 3 weeks more than I had learned in 6 months working on my own.	1
170	BA2009KN3	No statement.	
171	PM2009MA3.5	Once you getting responsibilities you also feel important and you feel that you have to complete it, you don't mind putting in that extra effort, whereas at varsity there was not that I mean it's for marks and as much as people think it's a good system it's not really that great a system, and I think the fact that it is yours and you need to get it done drives you to excel.	8
172	QA2009LT3.5	I think one would definitely have to be the crunch that myself and my third year development team went through in the final week before hand in.	6
173	QA2009MS2.5	It's a bit social and business, first of all, it was all pretty much centred around that project that we did in third year and that was interaction with you as the sponsor getting business requirements and interaction with our team building a project.	6
174	QA2009MS2.5	**We were taught coding with pen and paper. You don't teach someone to drive unless you put them in a car so that's the issue I had. Processes like that can and should be changed**.	19
175	DV2009AP3	I would say third year IS. That was pretty much it that is being thrown into the deep end and if you want to make it out on top you have just got to get to the next level.	9
176	DV2009JP3	No statement.	
177	DV2009LG2.5	I don't know how much has changed really you continue to being on a learning experience regardless of whether you are studying or at work. It's still learning especially for the first while I guess the only way I have developed I have kind of started to understand how real-life problems work as opposed to a closed learning environment.	8
178	BA2009SL2.5	No statement.	

179	BA2009RS2	We had to work things out for ourselves and fend for ourselves a bit and I think that really gave me my first real taste of real world IS project, like real-world analysis.	6
180	DV2009BM2	At UCT there is not too much responsibility at some point not working you take out that piece of functionality, but sometimes your system goes live but in general it doesn't. So if your marks do become the primary driving force of what you put in, you don't get bogged down by small things you just change what you do. So from a UCT perspective, there was not too much responsibility.	10
181	BA2009JS2.5	No statement.	
182	DV2010KD1.5	The one experience was not quite just one event but it was the experience of being able to work in an office and this enabled us to see what office life is like and it also gave us the opportunity to get help from people in the industry and to see where we were at the stage of being third year.	6
183	DV2010RP2	No statement.	
184	DV2010BB1.5	Yeah, I think definitely dealing with the client and going to the actual on site and speaking to him and finding out what he wants, because if he knew exactly what he wanted and how to do it, we would be there so that little bit of thread he gives you to pull on.	7

Relevant to Section 8.2.2 and 8.2.3

Table 17 : Readiness for Industry and Endorsement of Honours year

Ready for Industry?				
Response Number	**Respondent ID**	**Statement**	**Ready?**	**Advocate Honours?**
187	DV2006HL4.5	Adequate enough to give you the basis on an idea of say on development and how things hang together and worked. But the main thing is honours and gave much more perspective in terms of how everything hangs together an actually into developing a system.	N	Y
188	MSC2006DD5	No. My third year this is something, if you would be preaching to the choir this is something I am extremely firm on and that is that the honours year **takes all the strings and ties them together**.	N	Y
189	DV2006RL4.5	I was not at all well prepared. I think a lot of that stems from IS not really preparing individuals fully to go into a development direction.	N	N
190	DV2006SM4	No. I think when I arrived at [Company] in a software development role it was quite challenging and I had done honours because we didn't actually get, or I don't think we got the **right type of experience** during our third year project or during software development during campus.	N	N

191	PM2006GA6	Whilst the experience gained in 3rd year was a very solid foundation and may have been adequate to start working in industry I believe strongly that the experience gained in honours year was a must and definitely gave me an advantage over those who hadn't continued further than 3rd year. The honours year for me really **cemented** the learnings of the first 3 years and rounded off our degree.	Y	Y
192	PM2006FC4.5	It certainly did provide a foundation in the sense that I joined a SAP as a consultant and my experience in process mapping, business analysis from my third year certainly did give me an advantage and understand how to dissect business problems from an IT perspective.	Y	N
193	DV2006MS3.5	I think third year was an adequate preparation for working in industry, but I definitely feel that honours **solidified** the experience. Working for a year as a junior may have provided similar benefits as honours, although I do feel that other important skills were learnt during that time.	Y	N
194	PM2007IS3.5	**The basic framework was there**, we did a lot of courses a lot of soft skills had been gained by that point. Still **not**, I would say **100% complete** I would say honours got us to that point, or got me to that point and in terms of leaving university and things.	N	Y
195	MSC2007ME3	I would say it was adequate, I obviously went on to do the fourth year as well so yeah I think had I gone into the working world after the end of third year it would have perhaps taken me a bit longer to kind of develop those teamwork and project management my own personal management of time, I think there was a lot of learning that happened in fourth year as well.	Y	Y
196	BA2007SV4	The 3rd year course set a very good foundation. That said, the knowledge and validation of the Honours year at UCT was also very important. Without the Honours year, the 3rd year course would not, in my opinion, prepare the student as well for the industry.	Y	Y
197	PM2007DR4.5	I definitely think so…. So I think third year is good but an honours is definitely better.	Y	Y
198	PM2007AD5	No.	Y	N
199	BA2007RI3.5	I am saying no. I mean you could I think I would have been fine. I think I would have not been as prepared I think I would have needed a lot more coaching and development in my first year of work but I think honours gives you that yeah. It really prepares you, you work on your own a lot more and you work in your teams on your own a lot more, even though there is support, I think honours helps a lot.	Y	Y
200	BA2007JS3	Oh yes, in third year, we as a team, and me in particular, we found third year the most career	Y	Y

		defining year. We found honours to be a breeze after third year.		
201	PM2007KM4	No. Yes. Let me think about it the reason I say no and yes is because I will actual split that up into two aspects. I think from a technical skills perspective however in terms of just basic experience no so honours just added that additional year of working in a team, experience always better equips you so honours just adds that **extra layer** of a different challenge and also adds on the additional work load so it's a lot **closer to an industry experience** to what third year was so I think it's **essential**. It's an important fact of getting into the workplace but if we are looking at pure skills in terms of looking at my job today all of that was from third year, not only honours.	N	Y
202	MSC2007WW3.5	The third year project was a good first taste of what it means to implement a software solution but I don't think on its own it was sufficient to prepare me for industry. Learning is an iterative process and in my honours year I was able to solidify what I had learnt in the previous year as well as address other developmental areas.	N	Y
203	QA2008YT5	Ok when I applied for my first job after UCT and the interviewer gave me the opportunity to test my skills and it involved a lot of QA skills and coding skills and I proved myself to have more analyst skills and QA skills despite the fact that I did not attend honours.	Y	N
204	QA2008JM3	No. There was a huge, what do you call it? **Jump in the curve** when we joined honours and the things we learned it was much more intensive, much more high demand in terms of what the lectures expect from you the quality of work combining that honours project with a thesis which is a third of our grade which is also challenging on an aspect that we are not all familiar with and is completely different to third year.	N	Y
205	QA2008AR3	Yes, but I defiantly think so.	Y	N
206	MSC2008CA3	I would think it was adequate, like all the basic skills and the basic fundamentals were taught to us in third year, fourth year was just **building on** that and drafting yourself in any area you were not sharp in or you were not strong on, but I think all the basic fundamentals were laid in third year.	Y	Y
207	MSC2008JG3	Perspective, they prefer people to have done a fourth year, purely that second project provides a lot more skills based development on their part and so in terms of hiring capabilities.	N	Y
208	DV2008AO3.5	Not really, no. I think that there was a lot of learning I did and I grew a lot in third year from second year but I think the jump from third year to honours was an even bigger jump. It really helped me sort of improve my knowledge and just get better, become a better coder	N	Y

		and coming into industry was already quite tough. There is a lot of learning it's very challenging and if I hadn't had that experience in honours I think I would have struggled a lot more and even I guess you can start off a lot sort of slower if you don't have the honours but I don't know if it's adequate.		
209	BA2008NN3.5	It was more than adequate. When I started working, I was thrown into the deep end and I coped quite well.	Y	N
210	DV2008PK2.5	Yes, very very adequate, I mean the theoretical knowledge you know helps you build so much, we learned during third year we learned visual basic and in honours we were able to branch out to c# by ourselves in our own private time.	Y	Y
211	BA2008LM3	I think so, it depends on the individuals whether they take the project seriously, if they follow the SDLC and PM principles it can provide a lot of preparation.	Y	N
212	DV2008MK3	Third year is a solid foundation for any entry level Information Systems IT job. However, for my career and for one to be able to have the skills needed to do business analysis, one needs to do the IS honours degree. After third year I enrolled for honours, the honours year **shaped** me for IS industry. The Job was a plug n' play scenario.	N	Y
213	BA2008MM2.5	The foundation was adequate for learning initial lessons, but failing in those experiences **knocked** my confidence, and thus having an extra year to apply the **lessons learned** successfully taught me how to confidently do things correctly.	N	Y
214	DV2009OL2.5	The 3rd year foundation was solid for my transition into honours. I am not sure I would be as ready as I am for work had I not gone into honours.	N	Y
215	BA2009II3	It was pretty fantastic.	Y	Y
216	DV2009PR2.5	From a programming point of view, I think holistically it was really quite adequate.	Y	N
217	BA2009KN3	**In terms of percentage I would give it a 60%.**	N	N
218	PM2009MA3.5	It was adequate but I am very happy I did the honours.	Y	Y
219	QA2009LT3.5	I think in terms of moulding my thought processes into a sort of systems thinking dynamic definitely I think at a finer level though it is not really because every company does things in their own way.	N	N
220	QA2009MS2.5	Yes, I think it depends a lot on where you are put though, for example I don't know if I would be as good in my job now had I not done honours.	N	Y
221	DV2009AP3	I would say it provides you with **kind of the minimal basics that you need to survive** in terms of being able to go into an organisation and kind of understand what they are talking about.	N	N
222	DV2009JP3	Yes and no. Yes the theory is where you are able to develop and be an analyst and things like that but I think honours gives you that extra push and	N	Y

		understanding of businesses and also all the theory that comes with that.		
223	DV2009LG2.5	**Adequate maybe, ideal probably not.** I mean yes, I could have started working after third year and picked up because a lot of what you learn is in industry as opposed to university, but fourth year is definitely a helpful year it adds a lot to how you analyse and tackle tasks and see situations and problems.	N	Y
224	BA2009SL2.5	Yes, I definitely thinks so, doing honours for me was just in terms of getting a **broader understanding** of the IS body of knowledge but I definitely could have started after third year, easily.	Y	Y
225	BA2009RS2	Possibly I guess it's hard to know exactly since we went straight into honours and then started working but having done honours you know after third year we could have cut it in industry but it would have been a lot slower start and would have had to have a lot more on the job sort of training.	N	Y
226	DV2009BM2	Depends at what level, I think you could go into industry but from a **junior level** and you would **have to be prepared to learn a lot**. Don't think you could be **left alone and know what to do straight off the bat**.	N	N
227	BA2009JS2.5	No definitely not. I needed honours. So I think third year did give me or gave us some skills and I think the skills were good, don't think I had enough exposure to project work.	N	Y
228	DV2010KD1.5	Truthfully no, if we had not gone out and taught ourselves what we had needed for our project, we would not have been in anyway qualified to start in industry.	N	N
229	DV2010RP2	I suppose any honours grad would have said no, honours just changes you. At the end of third year I thought I was ready and I thought I was all awesome and hard-core but during the project that I took to third year and fourth year, you realise you don't quite understand things, you don't understand how things work entirely but the final year just something happened and it just **rounded** me. To answer your question, no I was not.	N	Y
230	DV2010BB1.5	Absolutely. I found lots of the things that I dealt with in third year are coming back now, everything that I have dealt with so far, working here in the last month I have been comfortable, even if it's something I have not come across before.	Y	N

Relevant to Section 8.3

Table 18 : Role Switching and Origins

Role Switching and Origins			
Respondent ID	**Role**	**Stay in role?**	**Origin?**
DV2006HL4.5	Developer	No	Computer Science
DV2006SM4	Developer	Yes	Deeper
DV2006MS3.5	Developer	Yes	
DV2006RL4.5	Developer/Project Manager	No	Business Analyst
PM2006GA6	Project Management	Yes	
PM2006FC4.5	Project Management	No	Generalist
MSC2006DD5	Entrepreneur	No	Generalist
BA2007SV4	Business Analyst	No	Generalist
BA2007RI3.5	Business Analyst	No	Developer
BA2007JS3	Business Analyst	Yes	
PM2007IS3.5	Project Management	No	Developer
PM2007AD5	Project Management	No	Developer
PM2007DR4.5	Project Management	Yes	
PM2007KM4	Project Management	Yes	
MSC2007WW3.5	Systems Integration	No	Developer
MSC2007ME3	Entrepreneur	No	Developer
BA2008NN3.5	Business Analyst	Yes	
BA2008LM3	Business Analyst	Yes	
BA2008MM2.5	Business Analyst	No	Developer
DV2008AO3.5	Developer	No	Generalist
DV2008MK3	Developer	No	Not Dev
DV2008PK2.5	Developer	Yes	Deeper
QA2008YT5	QA	Yes	Deeper
QA2008JM3	QA	No	Business Analyst
QA2008AR3	QA	No	Developer
MSC2008JG3	Brand Ambassador	Yes	
MSC2008CA3	Document Analyst	Yes	
BA2009II3	Business Analyst	Yes	Deeper
BA2009KN3	Business Analyst	Yes	Deeper
BA2009SL2.5	Business Analyst	Yes	Deeper
BA2009JS2.5	Business Analyst	No	Not Dev
BA2009RS2	Business Analyst	No	Developer
DV2009AP3	Developer	No	Business Analyst
DV2009JP3	Developer	No	Generalist
DV2009OL2.5	Developer	Yes	
DV2009PR2.5	Developer	No	Generalist
DV2009LG2.5	Developer	Yes	

DV2009BM2	Developer	No	Developer
PM2009MA3.5	Project Management	No	Generalist
QA2009LT3.5	QA	No	Developer
QA2009MS2.5	QA	Yes	
DV2010RP2	Developer	No	Generalist
DV2010KD1.5	Developer	Yes	
DV2010BB1.5	Developer	Yes	

Table 19 : Effects of Teamwork

Effects of Teamwork			
Response Number	**Respondent ID**	**Stay in role?**	**Origin?**
2	MSC2006DD5	I guess knowing that I wanted to be the team leader the following year I knew it was very important that I develop those skills and sort of ironed out the kinks in third year so that I would be primed for the honours year.	5
5	DV2006RL4.5	Working in a team was **key to career development** - especially learning to manage one's self and others to a tight deadline where expectations may not always be realistic. Working in close proximity with a few people quite accurately mirrors life on client projects.	6
8	DV2006SM4	I think the actual third year project was a really good experience like it was good to work in a team with **people who had different strengths and weaknesses** so that provided good exposure to project management. It also gave me the opportunity to actually write code and work in a very real-life scenario with a sponsor outside of campus, so it was a really good experience, quite challenging as well.	6
13	PM2006GA6	I could share the experiences of working in teams and under pressure which was invaluable to being able to almost handpick from a host of job offers after graduating.	6
15	PM2006FC4.5	1. My team members. I worked with competent people and they were just as passionate in the work as I was. 2. My interaction with the lecturers, particularly Elsje Scott who was fundamental in my career development. 3. Being team leader for the systems development project. That ensured that I was on the ball regarding the project and that everything was addressed and on time.	6
17	DV2006MS3.5	Learning to work so closely with others in a team over such an extended period of time greatly helped in preparing me for work in the real world more than any other experience at UCT.	6

26	MSC2007ME3	I think again it was so clear that that was a vital requirement for a lot of the potential employers out there. You are working in generally some sort of project environment with teams and so yeah it was kind of clear that it was one of the primary things that everyone was developing skills and I was developing skills in a number of areas but if you could not bring it all together to work in a team it is kind of useless.	5
29	BA2007SV4	Teamwork: Ability to work under pressure with fellow team members, through the ups and downs, and also to motivate the team to deliver against the planned targets.	6
33	PM2007DR4.5	I assumed I was strong in analysis, you realise a bit later when you start working that you have got lots to learn.	3
43	BA2007JS3	Well obviously our third year project, it was a huge defining factor in my career, just the expose to interacting with clients and building the project from the ground up, working in a close team environment and creating something for me was just a great experience, a fun experience and just kind of validated the choice I had made in my university degree and just kind of from that point onwards, the role I was playing in varsity is the role I wanted to be playing in the working world. Because it felt like a role that could be continued.	6
49	PM2007KM4	Of my third year I suppose it's the group dynamics and the group projects so in third year I realised that as much as it was an area that I enjoyed, I wanted to work more with people so third year was the first time I went out and worked with a real business problem so we worked with the [Organisation] so I can list the entire relationship, the going there, the requirements and state were really good I loved that. Yeah, so that was when I really decided to make a choice of being involved in that process or just being a developer and I realised I was more inclined to working with people and doing consulting rather than going into dev.	6
55	QA2008YT5	They **were happy** with what I made and it pushed me in this direction because I was getting more **confident** from **confirmations** from others in the team.	6
63	MSC2008CA3	I would say the teamwork like, working in a team and the dynamics of a team and I think mostly for where I am now; the team work was what contributed the most back then.	6

66	MSC2008JG3	I think the thing is that each time or each project that comes along you have to change who you are to be able to work on the project that you are working with. I mean we have had various projects, I have had various projects where me personally have had to change the way that I approach A the client, B the work that I am doing, and C how I get it done, purely for the reasoning behind why the project is there in the first place. So making sure that something gets done might mean that you have to change how you work and that has definitely influenced who I am. I can't say I am better off or worse, but I can say that has happened three or four times in the last year. Each major project having its own kind of way of being and me as a person having to make sure that I conform to the requirements that are needed.	9
70	DV2008AO3.5	I think the main thing that shaped my career and my development was the third year, working on a real-life project, having to go out find a client, someone to work for, getting business requirements from them, doing the whole thing from scratch and doing it all ourselves as a team and then having to just create this system on our own. It was a huge learning curve and we had to mostly self-teach ourselves the majority of the stuff, especially as far as the development is concerned. In fact, more so with the development not so much the analysis. So yeah, lots of learning and very challenging and I think working on a team was also, the actual team work, slotting into roles, everyone finding their comfort zone and what they were good at and also being on such an ambitious team where everyone was **pushing themselves, pushing each other**.	6
74	BA2008NN3.5	The team work aspect was HUGE as well as it being deadline driven by nature. It prepared me for the real world. A lot of the work I do is team oriented and deadline driven. So remaining focused and working together towards a common purpose, resolving conflict where necessary has been key learning.	7
84	DV2009OL2.5	I got very ill in my 3rd year. Being so far away from home this was not easy. The work load for the year was also very large and so it was difficult to give my illness the kind of attention it needed. It was also tough explaining to lecturers that you are unable to deliver to their expectations simply because you are ill and not because you are incapable. It taught me to learn to take care of myself even when under pressure. Ultimately my illness is the type that could have been avoided had I given it attention early enough, but I ignored the symptoms simply because I could not afford to be ill at such a crucial time in my studies.	6

87	BA2009II3	They actually asked us to present to the IT Department and we gained that experience of showing a working system to an IT Department that is responsible for an entire province and seeing them engage and react in a way that is far beyond academia. It's not just a fancy prototype but something that could actually work in the real world it gives it a sort of realism that is quite engaging.	6
92	DV2009PR2.5	I just actually want to sort of say something, when I started working, I worked from home and even though I was working for someone, like a proper person like a proper business, I was very isolated and I had to learn lots of stuff by myself and I was not sure if I was going in the right direction and you don't always get **input from other people** saying look, I do this and it's hard to learn I have actually learned in the past 3 weeks more than I had learned in 6 months working on my own.	1
98	BA2009KN3	Yeah, I think the first thing is working in groups because with the final project you get to work with groups and everyone is doing their different subjects as well so you have got to find and come together and get to do the work and you also get to do your work in your own time so when I got here pretty much everyone who works in the team so probably met people they get to shop around. So yeah, in terms of team work it was good.	6
101	PM2009MA3.5	I think working, just generally working in a group environment on the project was a huge thing. I knew that was something that I wanted to involve them I don't know that necessarily did, **the fact that we were in a group and we sort of found our own strength within that group, so certain people were good at certain things which meant that you necessarily couldn't be the strength in that area, so you sort of found your areas so I found myself being pushed into that more analyst documentation role**. So that structure definitely pushed me in that direction so I think lecturers definitely play a part in that so if you get any form of positive re-enforcement, you are inclined to continue along that path if you feel that the lecturer thinks you are good at it.	6
104	QA2009LT3.5	I think we both **learned a lot and fed off on each other's learning energy** in June, and I think that was probably a big one. In terms of the third experience, I think definitely the back and forth we had during the design phase of the software we did a lot of discussion and came up with a lot of ideas.	6
110	DV2009AP3	Pretty much having to research a whole bunch of new technologies to use in our product, getting things to work just managing the team to get people to do what they want. To get them to work in time, handling group fights, I would say that's the social part of it but overall, I would say it's just one crazy experience that I learned so many lessons from.	6

115	DV2009JP3	The highlight I would say is participating in an actual group that is developing a project because the group it was not a big group, only 5, you could be **dynamic enough to switch roles** and basically do everything that you wanted to do and you could also develop in those areas because of that and you are also **exposed to other areas**. But because I feel that I was allowed to do everything that I wanted to do, it had a positive effect on my development in that area.	6
117	DV2009LG2.5	Third year I think I became quite good friends with one of my third-year colleagues, he was obviously quite bright and I think working together with him gave me a good understanding of things. A better understanding that I would have had alone and I think we actually worked together really well so in terms of that kind of friendship that developed, there was a lot of knowledge transfer that helped a lot.	6
123	BA2009RS2	I think our third year systems development project was definitely like a big driver of my development, although it was very structured and we had support systems and we had a lot of scaffolding around us. It was like us in a way being in to, not the deep end, not the shallow end but sort of the middle end. We had to work things out for ourselves and fend for ourselves a bit and I think that really gave me my first real taste of real world IS project, like real world analysis, you know coming into an organisation that you don't know anything about and having to learn what they do, how they do it, how can we improve things.	6
126	DV2009BM2	The main thing is third year is a working course and I realised after two years that my coding skills were very limited and the main thing it taught me is how to Google and how to learn so at the start of the project, I realised I didn't know much but constantly going on Google and learning how to do what was required was probably the greatest learning curve of that course and probably one of the best lessons I could have had. The other thing is that it was the first long group project so how to work with group members, it was the first time I had worked with more than one person for any extended period of time. I had been working for 5 people for a whole year, you learn a lot about team dynamics.	6
130	BA2009JS2.5	I think I did part-time work in development at the time and I had quite a negative experience with that and I didn't enjoy it as much as I thought I would enjoy it, so that influenced why I chose the IS route like I just kind of realised that I didn't want to be a programmer and secondly, I enjoyed the groupwork aspect of third year. That made me realise that I enjoyed working with people and not necessarily for people. And so I think those where the two experiences that shaped my decision making.	6

133	DV2010KD1.5	The one experience was not quite just one event but it was the experience of being able to work in an office and this enabled us to see what office life is like and it also gave us the opportunity to get help from people in the industry and to see where we were at the stage of being third year another one was I suppose how to deal with group confrontations and conflicts there is no real just one even but throughout we were able to come together and work past any problems and that sort of thing. The third one I suppose would be the social side even though we were working as a team, we were still able to interact sociably as friends outside of the project.	6
136	DV2010RP2	We aimed to expand our knowledge base and try and work with as many projects in as many different areas in our project so we integrated with hardware which was quite fun we basically focused on project management methodologies and tools as a whole and we delved into doing some proper projects because up until then we had been doing windows form based and web based is a totally different realm.	4
139	DV2010BB1.5	I think it is always interesting being in a group, there are always some dynamics that come up with that, especially for the SD which is quite a long or big project. I found that the situation is what there could be a dispute and it could be quite **awkward** and it could be **quite tough** and go so there was a few incidence with that group where you have plans and you have to cancel or you said you would do something or this person said this or that, it can get quite **nasty** at times	6

Appendix D - Graduate Recruitment Officers – Summarised Responses

Table 20 : Responses from Graduate Recruitment Officers

Graduate Recruitment Responses – Summary							
Question Company		**1**	**2**	**3**	**4**	**5**	**6**
1	What incentives/interventions do you give your fresh graduates to embrace the organisational culture?	Grad program 1 year	Cultural induction, mentorship, leadership by example, feedback	Conference	Cultural induction	X	Training and incentive bonus
2	Do you offer any ownership of work or offer equity?	Yes	Yes, "autonomy and freedom to manage one's own work"	Yes - "share of profits"	Ownership of work	Yes	Performance based bonuses
2a	If yes - does this help with motivation?	Yes	"Without a doubt" People get more excited about their own ideas"	Yes	Yes	Yes	
2b	If no- why not?						Offer shares when person becomes indispensable
3	Can you briefly contrast the mindset of a final year university student to what you expect/want from your fresh graduate? What are/have been the issues/stumbling blocks in moving students between those two mindsets?	Arrive with "know it all attitude", dies off, humbling experience	"In most cases, there is a noticeable difference between a third year student and an honours student. We find a good alignment of our expectations with honours year students, as they are usually more self-sufficient; better at managing themselves and their deadlines; take more initiative and exhibit more proactive communication habits."	Not "self-starters" too reliant on supervision	"Students are not prepared for the workplace - basic email etiquette/how to operate in the corporate environment "	X	Look at IS honours graduates. Find the move into consulting smooth as the honours course has a full project lifecycle.
4	Do you observe an increased sense of pride and commitment after the graduate has completed their first few tasks?	Growth in humility, Growth in Pride	Absolutely - growth in confidence	Yes, but there is a delayed gratification issue	Yes	Yes	Yes. Bi-annual reviews as well as mentors.
5	In the initial phases of the program, are students timid/hesitant in their first interaction with clients? E.g. would they prefer to deal with internal projects rather? Do they want to follow more senior staff? Do they want to be "thrown into the deep end?"	Some "keen to get stuck in with clients" other timid, balances after 6 months	Case of nerves but still keen, "respond well to being thrown in the deep end and tend to feel 'held back' if they aren't	Generally want instructions, element of timidity	Grow with responsibility	x	Most like to get onsite and work with seniors quickly.
5a	How would you deal with any timidity/hesitation?	Scaffolding "Support is most important. Keep tasks to low impact, low criticality at first. Use the Care and Growth model to strengthen weaknesses. Increase difficulty of tasks as proficiency grows"	"Encouragement and support from their team members, project manager and mentor."	Presentations	Caters for different types of people	x	Have an outsource team that is a more sheltered environment with extra mentorship. Also have training facilities for soft skills.
5b	If no, how often has this confidence translated into success?	Success not related to confidence	"However, usually by the second or third time round they are feeling the confidence boost"	Usually		x	When graduates have been asked to be thrown into

							the deep end results were good.
6	After completion of interactions with clients, do you observe an increased sense of confidence in graduates?	Same as internal work, same sense of achievement	Yes	All internal but is growth over time	Yes	x	Definitely.
7	Is there any 'free time' allocated? Time where graduates can work on their own projects and thereby bring new ideas/insight into the company?	Yes	Yes	Not formally	Yes	Not Formally	No
7a	If yes, are graduates more excited about this time?	Yes	Yes "it's human nature"	Not formally	"Often they are excited to work on their own material"	x	X
7b	Have these initiatives produced useful outcomes?	Go into production	Yes	Not formally		x	X
8	After having completed your recruitment drive, do you assume the students will fit into your company or do you have moulding procedures in place?	Refer to 1	"A mixture of the two – we do hire with work ethic, culture fit, soft skills etc. in mind" still need to reinforce	Administrative Induction, shared office	Based on "our culture"	Some presentations on technical and product related topics don't like this just want to start working	Have an induction process. Cultural values are communicate d.
9	What level of mentorship do you provide your graduates? Do graduates get allocated mentors or do you allocate mentors retrospectively when expectations are not met?	Everyone gets 1 month check-ins	Mentors	High level of supervision	Mentor and buddy	Scrum - serves as informal mentorship	Every graduate has a mentor
10	What feedback mechanisms are in place? Is this feedback just a formality or does it result in changes in behaviour?	Behavioural modification	Ad hoc, frequent, informal and formal "it's demotivating to wait a whole year to tell someone they're not getting an increase (or getting a poor) one because nobody bothered to tell them they were doing something wrong. You need to empower them early on to fix the problem."	Part of the route, weekly basis	Quarterly reviews effective	Monthly performance reviews for 3 months	Have formal review process twice a year but also have informal feedback and corrective action.