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## Old Tribes, New Tribes: the Extent to which Discipline Cultures Impact on the Development and Delivery of Cross-Disciplinary Undergraduate Degree Programs? a Study of the BSc in Product Design at the Technological University Dublin

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## **Old Tribes, New Tribes**

**The extent to which discipline cultures impact on the development and  
delivery of cross-disciplinary undergraduate degree programs?**

**A study of the BSc in Product Design  
at the Dublin Institute of Technology.**

**by**

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In Partial Fulfilment  
of the Requirements  
for the MA in Higher Education

Dublin Institute of Technology

5<sup>th</sup> July, 2011

## **Declaration**

This work has not previously been submitted for a degree or diploma in any university or Institute of Higher Education. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

**Signed:** \_\_\_\_\_

**Robert Tully**

## **Abstract**

The research presented in this thesis focuses on two objectives, the first and main objective being to investigate the impact of discipline cultures on the development and delivery of cross-disciplinary undergraduate education on the BSc. in Product Design at the Dublin Institute of Technology. The second objective of the thesis is to consider the changes that occur as a result of the ‘tribes’ cohabitating on these cross-disciplinary education programs. The underlying interest in answering these questions lies in the implications for the way in which programs, which have a cross-disciplinary intention, structure, develop the syllabus, enable discourse and facilitate collaboration in order to maximise the potential of their objectives.

Several literatures were relevant to the research and material was interrogated from design, academic and discipline culture, curriculum development, collaboration, identity, higher education, teaching and learning and knowledge construction. The themes used to structure the research questionnaire were essentially derived from this literature.

Academic and management staff from across three different schools representative of three different and distinct academic disciplines and cultures were interrogated about their experience of this cross-disciplinary and cross-college educational intervention. The research presented in this thesis makes a contribution to the understanding of the way in which discipline cultures impact on the development of cross-disciplinary educational interventions. The results indicate a particular importance on socialisation as an enabler within cross-disciplinary collaborations. Based on the findings and conclusions of this study, implications for the future development of this and future educational interventions of this nature are described with recommendations on future research opportunities.

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# CHAPTER 1

## INTRODUCTION

Clark (1987) argues that from a cultural perspective, the University does not form a one-voiced homogeneous whole but a heterogeneous entity with many different “small worlds”. These “small worlds” or “tribes”, as Becher (1989) refers to them, “have their own traditions, cultures and categories of thought each carrying its own social and cultural characteristics, norms, values, modes of interaction, life style, pedagogical and ethical codes” (Biglan, 1973; Clark, 1986; Ylijoki, 2000). In particular, Biglan (1973) codified the general characteristics of academic disciplines into a “*typology of academic disciplines*” which was essentially a framework to categorise them in relation to each other. This framework appears to be a central reference for many subsequent researchers in the field. (Becher 1989, 1994; Becher & Trowler, 2001; Creswell & Roskens, 1981; Neumann et al., 2002; Newell, 1992; Trowler, 2009; Whitmire, 2002; Ylijoki, 2000).

In constructing educational interventions which draw on these “small worlds” or “tribes”, it is important to understand and respect the “indigenous” characteristics that prevail within disciplines. Inevitably, new cultures will emerge from subsequent successful interventions but likewise failed interventions can damage future relationships. Cultures are defined in a variety of ways, as shared philosophies, ideologies, values, assumptions, expectations, attitudes, and norms shared within a community (Kilmann, et al, 1985; Maassen, 1996; Massen & Vught, 1996; Peterson & Spencer, 1990; Pinch, 1990).

The way in which disciplines or cultures are defined or define themselves by their philosophies, ideologies, practices, codes, ethics etc. contributes to both the internal and external identity. Identity itself is at the heart of the value base that draws individuals to the discipline or culture.

While the intention in the general introduction is to position this study within the academic discourse of disciplines and cultures, there is also a separate and significant context which should be introduced. Appendix A provides an historical introduction to the economic and industrial context that led to the development of the BSc. in Product Design at the Dublin Institute of Technology.

## RESEARCH QUESTION

The historical context set out in Appendix A, provides an insight into the relevance of this particular intervention and highlights a number of critical elements in the development of design and design education that were drivers for the development and implementation of the BSc. in Product Design. These include the repeated recognition of the benefit that design can bring to the economic, industrial and social wellbeing of the state. However, the fact that there needs to be repetitive dialogue around the same issues is suggestive that the interventions are not adequate, or that they are not managed or fostered appropriately. Reports dating back to 1949 have highlighted the need for design and industry to be drawn closer and more strategically together, (Bodkin, 1949; Ffrench O'Carroll, 1967; Franck, et al, 1961; NESc, 1993; Price Waterhouse Coopers, 1999; Richards, 1976).

Success does not automatically manifest itself from the intention, or the recognition of a particular need. Success manifests itself from bringing the right constituent elements together and managing them through the process. The BSc. In Product Design is an appropriate intervention, with clear evidence of need and support. A program of study has been constructed to reflect societal, commercial and pedagogic demands. Maintaining a pedagogic balance between these various demands is part of the responsibility of the academic profession.

The primary purpose of this study has been to investigate the impact of discipline cultures on the development and delivery of a cross-disciplinary undergraduate degree program, specifically the BSc. in Product Design at the Dublin Institute of Technology. It has involved examining both the explicit and implicit difference in philosophies and cultures that exist within and between disciplines as defined within the formalist structures of 'college' or 'faculty' in higher education.

In interrogating the breadth of existing literature on the subject of disciplines and academic culture, this study set out to enable a more knowledge based relationship structure for collaborative undergraduate programmes to emerge. There is a practical need for a relationship structure that recognises the philosophical and cultural differences between the contributing discipline bases to enable them to navigate differences. Within disciplines, members of the academic 'tribes', are likely to have a discipline based worldview which

contributes to their comprehension of 'self' and 'other' inside and outside the discipline. One of the objectives of the study has been to identify the means to enable a critical discourse between the different tribes. Boland and Tenkasi (1995, p.362), argue that we need to possess "the ability to periodically suspend our natural attitude and notice the matter-of-course, taken-for-granted ways in which our communities of knowing are constructed and interpreted, which can open possibilities to change them." All too often disciplines are reluctant to engage positively in a structured discourse or cross discipline activity.

A secondary aim of the research has been to determine the nature of the changes that occur as a result of 'tribes' cohabitating on cross-discipline activity, specifically, in the case of this research objective, on an undergraduate science degree. Appreciating discipline differences and commonalities is a necessary enabler of cross discipline collaboration. Finding a common vocabulary that encourages a critical discourse to occur becomes an essential though often ambitious goal. Any common vocabulary should avoid challenging the nature of knowledge, know-how, methods and discourse within a discipline and facilitate yet enable a fluent engagement.

Previous research conducted in the area of disciplines and cultures indicate issues that can arise in relation to differences that exist between language, methods, philosophies etc used by these disciplines. As an academic with experience working across disciplines the author has personal experience of the confusion that can arise between the 'comprehension' of intentions and methods used within disciplines. The existing literature supports the authors' conviction that there are substantial issues that have not been adequately investigated which continue to bear influence on the effectiveness of cross-disciplinary education.

There would also appear to be minimal research attention directed towards these issue in a manner that can enable constructive interventions to occur in the improvement of inevitable conflicts of cultures between disciplines. By examining this field in the manner proposed it is hoped that we can better understand the conceptions and misconceptions that impact on the effective delivery of cross-disciplinary education in higher education. This is not to suggest that the general body of cross-disciplinary educational activity is somehow deficient. Clearly it is not, but nevertheless, it would be foolish to ignore the fact that there are definite discipline cultures that exist which use entirely different reference points and which could benefit from an understanding and appreciation of ways to negotiate through collaboration

issues. With this understanding it may be possible to develop research activity that could inform the process of collaborative education in a structured and effective manner. Both administrators and academics involved in such interventions would be enabled to plan, develop and implement them in a more informed manner.

### **SPECIFICATION OF A PURPOSE; *PURPOSE STATEMENT* (Creswell, 2008)**

Having considered the general and historical context out of which this program has evolved the focus of the study will be placed firmly on the context, within which it currently resides in order to inform the development of the BSc. in Product Design into the future, as well as the development of interdisciplinary education in general.

The purpose of this study therefore has been to develop an understanding of the dynamics of interdisciplinary undergraduate degree programs based on the interrogated experience of the BSc in Product Design at the Dublin Institute of Technology. The original intention was to undertake a purely qualitative study which aimed at investigating the subject through interviews, questionnaires and primary and secondary source literature and documentation. However, for practical reasons the emphasis was placed on questionnaires and no formal interviews were undertaken. The questionnaires provided the opportunity to collect quantitative data, which has been used in conjunction with the qualitative material.

The central phenomenon of the study revolves around the nature and effect of discipline culture and identity on these dynamics. The study focuses on the academic staff and program leaders with responsibility for development and implementation as a means to understanding the dynamics of this specific intervention.

However, while the emphasis has been placed on an interrogation of academic staff and program leaders, the study also acknowledges, through selected literature, the student perspective regarding discipline culture. This study has not interrogate the student experience of the BSc in Product Design but instead has limited itself to a general perspective on student experience and how this informs views of both profession and discipline.

As we engage with more complex problems to solve, designers are one of the groups of people in whom we invest responsibility to make increasingly difficult decisions regarding technology, materials, resources, ergonomics etc. Ensuring that we construct effective educational interventions to enable individuals to maximise their potential is an essential responsibility of educators and institutes of higher education.

However, in order to achieve effective educational programs we need to understand the various dynamics that influence both the academics and the academic 'worlds' or cultures which they inhabit. This study explores a number of these influencing dynamics as a means to a greater understanding of cross-disciplinary educational interventions.

The focus on a cross-disciplinary educational intervention carries significance in so far as it engages the strengths of the 'discipline' traditions of knowledge construction. In the increasing complexity of problems to be solved and in the face of a changing higher education landscape, these discipline traditions can be forged into new dynamic relationships that will yield greater strength and capability.

"The whole is greater than the sum of its parts."

Aristotle

## **ASSUMPTIONS**

This study makes a number of assumptions which have been outlined to establish the critical positionality.

The selected references and selection of material for the literature review has been broadly based on material which has been published in academic journals and by reputable publishers. The integrity of the writers and researchers is assumed on the basis of the 'culture' of learning and research to which we all aspire to within the field of higher education.

While the study draws on a broad range of sources and interrogates a variety of primary and secondary materials in both breadth and depth the results of the study presented are understood to represent the BSc in product Design at the Dublin Institute of Technology as it has been manifest over the duration of its existence to date between 2003 and 2011. Its outcomes are assumed to be specific but may resonate with experiences across different programs, departments, schools, colleges, and institutes. The experiences of the group of individuals who constitute the BSc in Product design are unique to themselves.

The responses to questions provided by staff and management of the BSc. in Product Design have been given in an honest manner, without undue pressure to respond.

## **LIMITATIONS**

While every effort has been made to encourage all staff to engage in the research through the questionnaire, a significant number of staff chose not to respond. This limits the general applicability of the results, as in some cases the discipline based responses could be directly affected by the response levels.

While every effort has been made in the structuring of the questionnaire to avoid an author or discipline bias, there is no way to avoid the possibility of answers to questions carrying some respondent bias. This must be acknowledged as an aspect of the research methodology used.

The cross-sectional nature of the data collection process used in this study represents participant's perceptions and knowledge in relation to circumstances and experiences at the time of the data collection. While a number of questions were designed to encourage a reflective response, the research design cannot control or direct the participants to respond in a particular manner.

Another limitation to acknowledge is that some confusion may arise regarding vocabulary. Terms have been used by a number of authors which have degrees of difference in meaning as a result of their particular discipline background, institutional or geographic context. While every effort has been made by the author to contextualise these differences, it has been important to stay true to the vocabulary of the original author when using quotations.

## **ETHICAL CONSIDERATIONS**

As author and researcher I am aware of my particular bias towards areas relevant to the research question. I am also aware of the bias that might be inferred through my own involvement in the design, development and delivery of the BSc in Product Design.

The research will be conducted within all appropriate ethical guidelines, taking consideration of:

- a) Negotiated access to materials and subjects as appropriate
- b) Informed consent with regard to the purpose and aims
- c) Privacy, confidentiality and anonymity as appropriate
- d) Recognition of sources as appropriate.

## **CHAPTER 2**

### **REVIEW OF THE LITERATURE**

#### **INTRODUCTION**

There are a number of relevant literatures which needed to be interrogated in order to establish a baseline for this study. These emerged through the reviewing process itself and while structured in theory it was organic in practice. The central body of literature was interrogated over the course of this study has revolved around the area of discipline and organisational cultures within higher education. However, any discourse on culture separated from the dynamics that influence the character or nature of that culture would fall short of the need for a rigorous interrogation of the subject.

As a consequence it has become necessary to explore issues around changes in higher education, boundary work, collaboration, identity, curriculum, knowledge and indeed the culture of design itself. (See Figure 1.) While there is an extensive literature on the nature of disciplines and discipline cultures and related issues, this literature also transcends a broad range of disciplines and so the interrogation extensively crosses disciplines and boundaries to provide a breadth of insights.

The extensive literature review undertaken as part of this study forms a significant element of the work conducted. The comprehensive referencing from this literature and the attached bibliography reflects the extent to which the literature has informed all aspects of this study.

In relation to the research question a number of distinct strands emerged from the general literature being reviewed. The main body of the available literature focuses on the acknowledgement of differences in cultures emanating from distinct qualities of discipline ‘architecture’ and ‘archaeology’. One stated objective of the literature review was to determine where deficits might occur within the existing body of material. There are two main areas where gaps in the literature appear. Firstly, there is a lack of literature which focuses on the assimilation of various discipline discourses into constructive debates and secondly there is a lack of consensus evident in many areas of discipline based discourse. These suggested gaps in the critical literature have assisted in focussing the direction of the data collection and subsequent interrogation of that data.



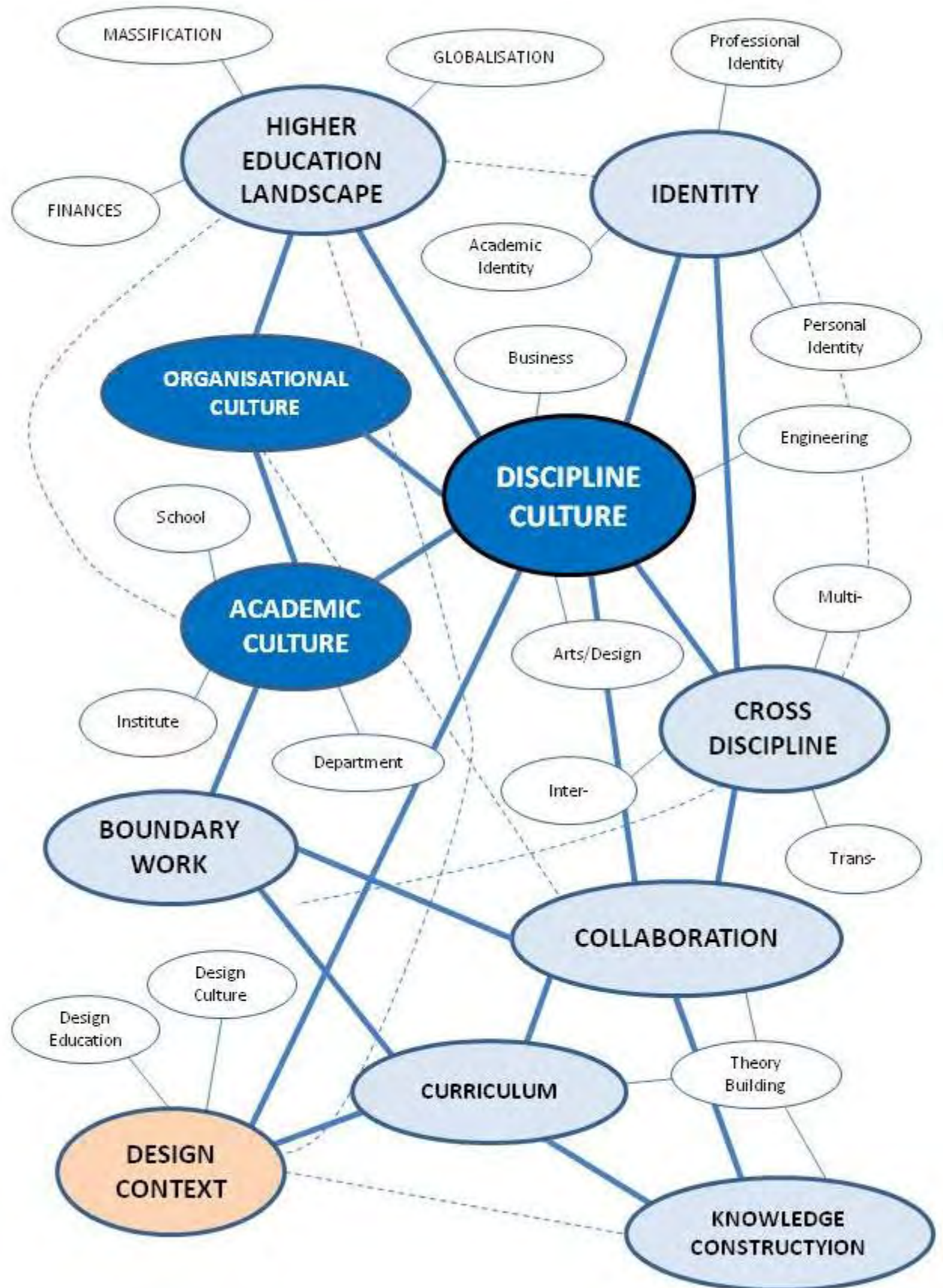


Figure 1. Literature Review Thematic Map

## **CHANGES IN HIGHER EDUCATION**

### **Higher Education Landscape – Changing Climate**

Tully, (2010 p 6), indicates that in “The Idea of a University”, published in 1852, Newman outlines a vision of an institution centrally concerned with knowledge and critical thought. Newman’s vision of the ‘University’ was of an institution which would provide a liberal education, enabling liberal knowledge providing an acquired illumination, a habit, a personal possession, and an inward endowment (Newman, 1982, pp85-86). However, while this vision became a prevailing ambition of many Universities throughout most of the 20<sup>th</sup> Century, recent decades have seen a dramatic shift where mass higher education and market forces have dramatically dominated the agenda and influenced the shape of higher education on a global scale (Tully, 2010). Marginson (2008) suggests that we are at a turning point in history which can be compared to the transformative impact of the industrial revolution. Peters et. al., (2009) suggests that we are now moving towards a world which will enable all humans to interface with each other and with a common body of knowledge. The philosophical challenge facing higher education is one which acknowledges that we are on the threshold of a dynamic future which metaphorically resides on the edge of a great abyss. (OECD, 2007; Pedro, 2009; Trowler, 1998)

Singleton-Jackson & Newsom, (2006, p194) offer their own set of emerging themes facing higher education in the current changing context they suggest that “as higher education reflects on its history and its future, all evidence suggests that despite the changes that are made to its periphery, it will continue to serve as a primary provider of knowledge – at its core it will remain a vehicle of both change and stability for society.

Much has been written about the changes that are occurring throughout the Higher Education Sector. This literature recognises a worldwide context, which according to some observers has a “remarkably consistent worldwide reform agenda for the financing and management of universities and other institutions of higher education.” Zha (2009, p474) suggests that up until the current change in higher education, institutions were “relatively autonomous in relation to one another” and now institutes must operate increasingly within a market driven environment with limited public financial support and “increasingly compete with one another for revenue” (p463). Zha (2009 p 459) points out that for the past 30 years the neo-

liberalist agenda has forced institutes to be “more efficient in providing education and research services in large quantities” and become “more efficient, manageable and accountable” (p459). (Giroux, 2003; Goransson & Brundenius, 2011; Magyar, 2006; Meek & Salazar-Clemina, 2007; OECD, 2007; Singleton-Jackson & Newsom, 2006; Sibbel, 2009; Taylor & Boser, 2006; UNESCO, 2007; Winter, 2009)

McWilliam et al, (1999) argue that in the current climate the neo-liberalist agenda is eroding the academic integrity and identity. The Professional identity is being forced to change to meet a new 'set of values'. A strong critique on the changing face of the University is captured in an increasingly radical and polarised literature. There are multiple voices contained within this literature, one which speaks to the damage that is being visited on the integrity of the learning integrity of educational institutions, (Aronowitz, 2008; Clegg, 2008; Giroux, 2003; Harman, 1990; Haggis, 2006) and a voice which speaks to the inevitability of these changes and the need to adapt, (Prokou, 2008; Singleton-Jackson & Newsom, 2006; Taylor & Boser, 2006; Zha, 2009;) and another voice which espouses the positive qualities of the changes. (Holdsworth et al. 2006; Stephens et al., 2008; Sibbel, 2009;),

Significant challenges are outlined by the OECD (2007) where a multitude of issues are identified around the continued sustainability of the sector. In light of these issues part of the solution will ultimately reside in the ability of Academics and academic developers within departments, schools and Institutes to construct appropriately relevant educational interventions that meet the realities of the changing climate we are currently experiencing in Higher Education. Central to the motivation for the pursuit of new agendas in programme development will be the management of new synergies that enable greater relevancy to be achieved without sacrificing personal or ‘discipline’ integrity. (Hodgson, 2007; Hodgson & Reynolds, 2005; Ranson, 2008; Whitechurch, 2008,2009; Whitechurch & Gordon, 2009)

### **Changing Climate - Discontent within the Academy**

As already indicated an extensive literature exists on the changes that are occurring throughout the Higher Education sector. Higher education institutions have been transformed in recent decades as a result of global drivers which have resulted in a negative perception of the academic position by those involved in teaching and research activities. Martin (1999) suggests higher education institutions are dependent on the intellectual abilities and

commitment of academic staff that are essential to the continued existence and sustainability of the Higher education sector. However, a consequence of the changing landscape in higher education is a considerable discontent within the academy. This discontent is reflected in a number of the literatures under identities and academic freedom which are outlined in their own right within the literature review. These challenges are occurring on a broad international basis and not limited to particular sectors or regions. (Cuthbert, 1996; Pienaar & Bester, 2005; Salmi, 2000; Zilwa, 2006; Zahiria, 2002)

Karran, (2009, p264) indicates that the importance of academic freedom was recognised at the conception of the European University system in the 11th and 12th centuries and remains a central defining characteristic. The Magna Charta Universitatum outlines that "Freedom in research and training is the fundamental principle of university life, and governments and universities, each as far as in them lies, must ensure respect for this fundamental requirement", (European Universities Association, 1988, p1). However, a significant literature is concerned with the loss of academic freedom and explores the implications of this for the future of Higher Education.

## CULTURE IN THE ACADEMY

Few concepts in contemporary social science are as abstract and imprecise, and at the same time such a central object of study, as “culture”. (Grinker et al, 2010, p7). The literature on culture in the academy is central to the subject of this study. In the face of the changes impacting on Higher Education as already outlined, culture in the academy has never been so challenged. In fact, Silver (2003) poses the question “Does a University Have a Culture?” and considers a variety of conceptions of the university as a “culture of tolerance of diversity”, or a “culture of extreme diversity” or a “culture of fragmentation in tension”, but argues that all of these are unhelpful as he claims that “Universities do not now have an organisational culture”, referencing Kogans (1999, pp63-64). description of the concept of culture in Higher education as an “intellectual polyfiller....used to explain the inexplicable”. (Clifford, 1988).

However, every institution, by virtue of its existence, has a culture or ethos, which is derived from the shared values, beliefs, knowledge and habits of the members of the institution. Clark (1983) describes the specifics of a university culture and its subcultures. Wisniewski (1984, p6) suggests that the “norms of the total university culture dominate those of each unit in that structure”. There is a substantial and growing literature on universities as organisations. The ‘culture’ of Universities has become a subject of much debate and investigation. Clark (1997), Becher & Trowler (2001) and others have used the anthropological metaphor of tribes to describe aspects of the ‘culture’ that exists in these organisations. (Armstrong, 2006; Harman, 2007; Silver, 2003; Valimaa, 1998). However the anthropological metaphor has given way to a new metaphor, a corporate metaphor that uses the jargon of the corporate enterprise. Terms like Quality, (Houston et. al, 2008), organisational values, (Kleijnen et. al., 2009), sustainability (Johnstone, 1998; OECD, 2007), organisational change, (Ranson, 2008)

The culture in higher education institutions has traditionally been underpinned by a sense of academic freedom and autonomy and collegiality, which Ramsden (2004, p23) suggests is “closely related to ideas of individual academic freedom, disciplines as frames of reference, separation from external pressures, conservation of special knowledge, and academic professionalism”. An extensive literature debates the issue around academic freedom, some of which laments its passing, and some of which perceives such freedom as contrary to the new culture of accountability and quality.

Archer (2008) refers to the discourse of the “Golden Age”, where many academics lament the loss of a past in the face of changes occurring in HE. However, Archer, contends that the “Golden Age” is a contested concept where younger academics in particular often question its reality. However, its existence as part of an identity discourse constitutes its relevancy and impacts on the perception of a cultural position, or on the subsequent erosion of a cultural position. (Armstrong, 2006; Harman, 2007; Silver, 2003). McNay, (1995) describes a the transition from the collegial academy to the corporate enterprise in the Higher education sector and argues that universities are not ‘monocultural’ but overlapping cultures which include collegial, bureaucratic, enterprising and corporate subcultures. Taylor, (1999), suggests that these overlapping cultures should not be seen as competing but “are better understood as adaptively coexisting” (pp 80). (Taylor, 1999, 2008)

Within the field of academic culture there is a literature which explores the impact of the market driven policies in higher education and their impact on the way academics locate themselves in ‘cultural’ or ‘subcultural’ context within departments or other basic discipline units. (Clark, 1984, 1987; Becher, 1981, 1987, 1989). Barnett, (2000, p48) argues that “Large multi-faculty universities – and even relatively small institutions – are a conglomerate of knowledge factions, interests and activities. We cannot assume that the manifold activities of the ‘multiversity’ have anything in common. It follows that the notion that there could be a single binding characteristic that all constituent parts of the university share, that there could be an essence, has to be suspect”.

### **Organisational change within HEIs**

Further changes are occurring in the structure of control and management, with the emergence of academic developers, professional administrators etc . A substantial literature has developed on organisational change in relation to higher education which explores the context and impact of the changes on both the institutes themselves and those who inhabit them.

Whitechurch (2009,p 407) explores the rise of what she refers to as “blended professionals” within Higher Education and their role in identity formation as they “not only cross internal and external institutional boundaries, but also contribute to the development of new forms of *third space* between professional and academic domains”. This third space is categorised by

blurred boundaries between traditional academic and administrative or management domains. The characteristic of this third space include functions involves activity such as “student transitions, community partnership and professional development” (Whitechurch, 2008, p384). She goes on to suggest that third space can involve mixed teams of staff, often on short term contracts, working on funding bids, external projects and quality initiatives. Whitechurch (2008, p 387) also indicates that this third space may well be an indication of the where future academic identities will be constructed to form a “new generic form of third space professional.” Taylor (2008, p 38) proposes that the third space may contribute to a “reinterpretation of collegiality” within the Higher Education sector.

### **Organisational Values**

Kleijnen, et al, (2009) explore issues of organisational culture in higher education, suggesting that there is a misalignment between the emerging culture and the staff preferences in terms of what the culture should be. They suggest that there is little difference in expectation however between departments but that improvements could manifest themselves through “staff development and teamworking, consensus and participation, greater emphasis on dynamic entrepreneurship” among others. The new organisational culture in Higher Education is aligned more with corporate culture than with any previous culture of learning. The values which were central tenets of the traditional ‘University’ culture appear to be either eroded or considered irrelevant in much of the new discourse on Higher Education Institutes.

According to Schwartz & Bilsky, (1987 p551), values are ‘(a) concepts or beliefs, (b) about desirable end states or behaviours, (c) that transcend specific situations, (d) guide selection or evaluation of behaviour and events, and (e) are ordered by relative importance’, values are a core element of culture, (Hofstede, 2001, p 10) and can be personal, social-political, religious and professional, as well as scientific and characteristic of academic discipline. (Becher & Trowler, 2001; Smart et al., 2000).

In recent decades higher education has opened up to a broader section of the community and forced to become more consumer conscious. One of the consequences of this reality is an increased accountability being demanded of Higher Education by students, tax payers, industry and governments, (Cross, 2001; Gordon, 2002; Kezar, 2001, Kezar & Eckel, 2002).

The changing context of explicit quality, accountability and diversity are changing the culture of the university from one of collegial to one of managerial.

Another strand of the literature looks at the way in which organisational cultures and structures operate, both inside and outside of education. Here the literature acts to scaffold the organisational aspect of where academic disciplines and cultures inevitably reside and the contextual relevance of the organisation in terms of any informed discussion on specific discipline cultures. In fact it might well be argued that the organisation, whether that be the University or College is the defining culture which directly informs the discipline culture. On the other hand it could be argued that the nature and variety of discipline cultures it constitutes define organisational culture.



## **DISCIPLINE DISCOURSE**

Long before the academic structures of higher education emerged and long before disciplines as we now understand them formed, philosophers and scholars sought to understand how human knowledge was best gained and appropriately ordered and categorized. Ultimately, this intention to understand and classify has brought us to a system of disciplines within academic structures which are recognisable today in the form of Universities and Institutes of Higher Education. The formation of scholarly activity into distinct disciplines developed throughout the latter half of the seventeenth century and throughout the 18<sup>th</sup> century. These have been categorised and defined by numerous scholars to assist in defining the territory (Becher & Trowler, 2001; Biglan, 1973; Kolb, 1981; Weingart, 2010)

Nissani (1997) argues that “a discipline can be conveniently defined as any comparatively self-contained and isolated domain of human experience which possesses its own community of experts”, (p 203) and which can be virtue of this community of experts forms its own ‘culture’ a ‘discipline culture’.

### **Discipline Cultures**

Discipline cultures are at the centre of the subject of this study alongside academic culture as applied to the organisational context. Disciplines form a nucleus at the heart of the higher education system and maintain a ‘cornerstone’ significance in supporting the organisational relevance. Weingart (2010), while acknowledging the increasing discourse around interdisciplinarity, argues that “disciplines and their derivatives, specialities, and research fields, remain the principal organisational unit for the production and diffusion of knowledge” (p. 13). (Becher, 1981, 1987, 1990, 1994; Becher & Huber, 1990; Healey, 2000; Hofer, 2000; Hofer & Pintrich, 1997a, 1997b; Jones, 2009; Kluver & Schmidt, 1990; Neumann, 2001; Neumann et al., 2002; Pinch, 1990; Ramsden, 1997, 2004; Young, 2010). Huber (1992) contends that while the traditional view of discipline cultures would suggest that they are “highly stable influential environments for academic work” (p193) that they are also “narrow and blinkered” and unwilling to engage in collaboration. (Ramsden, 1997; Ashmar, 2002).

Ylijoki (2000, p.339) argues that “disciplines have their own traditions and categories of thought which provide the members of the field with shared concepts of theories, methods, techniques and problems. They also have their own social and cultural characteristics: norms, values, modes of interaction, life-style, pedagogical and ethical codes”. Ramsden (1997, p208) suggests from previous research on the subject that different academic departments are “inhabited by different kinds of lecturers and students” with considerable contrast between arts and sciences and between professional and non-professional courses. (Nissani, 1997; Sullivan, 2002; Turner, 1990)

Becher (1989, p23) makes the point that it helps if you think of different academic areas as 'academic tribes' which have different 'knowledge territories'. Within these territories fundamentally different questions are asked, and the ways in which “arguments are generated, developed, expressed and reported” (p23) are also different. The updated second edition of Bechers’ seminal text *Academic Tribes and Territories* incorporates research findings and new theoretical perspectives on discipline culture. Fundamental changes in the nature of higher education and in the academic's role are reviewed and their significance for academic cultures is assessed. Becher proposes frameworks and codification’s for the differences between disciplines and elaborates on the attributes that define the differences. Bechers’ 1989 edition classified disciplines according to both a cognitive dimension (elaborated by Kolb, 1981 and Biglan, 1973) and a social dimension (developed by Becher himself). Biglan (1973) appears to be highly influential in Bechers’ classifications and suggests a need to interrogate in a comprehensive way Biglans’ codification of disciplines. Initially there appear to be some discipline anomalies in Biglans categories, particularly with regard to where design might be placed. However, it does reference both fine and applied art and so carries a generalised categorisation.

Where disciplines have long established structures they will inevitable be resistant to the types of challenges evident from the changes happening across the higher education sector. Mahala & Swilky (1994, p 35-36) argue that one of the greatest obstacles to reform “is the resistance that stems from expertise” and further argue that “faculty are separated by specialization, and this compartmentalization of academicians and knowledge discourages conversations across disciplinary divisions”. Dervin (2003 p 12) suggests that as disciplines mature the boundaries between them have become more numerous and more rigid because the discipline discourse is forged within the boundaries. However, Sinaceur, (1977) argues

that “the idea of a totally closed discipline, alone able, by its absolute interpretation, to overcome the ancient suspicion of mixing the genera, is impossible to entertain” (p, 573)

An extensive literature exists around the impact of discipline on the pedagogic context. In his paper on *Disciplinary differences in knowledge validation*, Donald (1995), argues that the central source of identity for academic staff are disciplines and that the “degree of coherence or structure within a discipline and the principle methods of enquiry affect the quality of learning” (p53-54). Bain et al., (1998) suggest that the epistemological and educational assumptions of academics has a significant influence on the educational context within which students learning occurs. They go on to argue that academics will differ in terms of which forms of knowledge are most valuable, how they should be organised and what methods should be used by both themselves and their students. Becher (1987) discusses the cultures of academic communities, the epistemological distinctions between different fields of enquiry, and the interrelationship between the two. He talks about the meaning and relevance of tacit knowledge’ in the discipline and discourse and refers to Gerholms’ (1985) suggestion that tacit knowledge is acquired slowly through the interactions with others without any deliberate effort made to teach the rules of the game. Becher (1987) goes on to discuss the contrasting vocabularies that occur between a number of disciplines, summarising that the disciplines “display fundamental differences not only between types of evidence and procedures for proof, but also in the ways in which others’ work is evaluated and in the modes in which the arguments are generated, developed, expressed and reported”.(p273)

Burton Clarke (1983, p72) suggest that “All major social entities have a symbolic side, a culture as well as a social structure, some shared accounts and common beliefs that define for participants who they are, what they are doing, why they are doing it, and whether they have been blessed or cursed”. Maassen (1996) suggests that the initial interest in the concept of higher education culture resulted in ethnographic or ethnologic studies of universities and colleges being undertaken by Clark (1960), Trow (1960), Barton (1961), and Pace (1962). A number of other studies highlighting various issues of organisational culture in higher education have emerged in the literature. These include a case study illustrating a diagnostic framework aimed at cultures in higher education (Tierney,1988, 1991) and a study applying the Biglan model to student behaviour and disciplinary differences (Whitmire 2002). Other studies in the field include one which demonstrates how institutional and disciplinary cultures can impact on different aspects of departmental culture (Lee, 2007) and another study

examines the impact of disciplinary cultures on the moral order of student experience in four Finnish Universities (Ylijoki, 2000). The diversity of research drawn together by the contextual reference to discipline cultures is relevant in appreciating the significance of the subject. (Austin, 1990, 1994; Weingart, 2010).

The discussion on the culture of disciplines in higher education is also impacted on by other aspects of the higher education system. Austin, (1990), suggests that academic staff in higher education institutes live and work in four distinct cultures: (1) the culture of the academic profession, (2) the culture of the discipline, (3) the culture of the academy as an organization, and (4) the institution type. Each of these cultures influences how the academic staff function within the overall organization.. Austin, (1994), points to the positive benefit that can accrue from exploration of the culture and climate experienced by faculty in a department or unit. This paper outlines how this benefit can assist in the management of these academic units.

According to Weingart (2010, p8), Academic Disciplines have a dual identity, the first being their social identity which is constituted by the rules of membership and manifests itself in the “teaching, examination, certificates, careers, the attribution of reputation, and, thus, the formation of a hierarchical social structure”. The second identity, the factual identity is “constituted by the contents of communication” and manifests itself in the “delineation of a subject matter, a common set of problems and theories, concepts and specific methods to study it”. Weingart (2010 p 8) also argues that “Academic disciplines are not formal organisations but social communities bonded by communication” and take on different organisation forms depending on the nature of the discipline itself.

There is an expressed anxiety within some of the literature that the Academy has lost its way, (Klein, 2010, p26), “The excessive specialisation, the lack of societal relevance, and the loss of the sense of the larger purpose of things are tokens of these concerns”, (Frodeman et al., 2010, xxxii). In The oxford Handbook of interdisciplinarity, Frodeman, referring to part 2 which deals with ‘Interdisciplinarity in the disciplines’ acknowledges that “interdisciplinarity manifests itself differently in different disciplinary contexts”(xxxv) and that paradoxically “disciplinarity is the precondition for interdisciplinarity. The study looks at issues which emerge as we cross between the various defining structures that exist within higher education. Faculties, (or Colleges as they are now referred to in DIT), Schools and departments are

identifiable elements of HE structures and represent both administrative and academic hierarchies.

Characteristically the underlying basic unit of exchange however, is definable as the 'discipline'. The disciplinary nature of higher education institutions relates to its historical roots and is primarily responsible for the shape and form of the current representative structures of Higher Education in the western world. 'Discipline' remains at the heart of the current higher education system and discourse, (Becher, 1990). The vocabulary we interrogate in this section clearly roots itself in the disciplinary discourse as we refer to cross-disciplinary, multi-disciplinary, inter-disciplinary, or trans-disciplinary.

There are a multitude of perspectives on the area of Academic Disciplines. Some focus on the body of knowledge, suggesting that the academic disciplines are constructed from an epistemological and socio-cultural perspective (Becher, 1989; Lattuca, 2002). This perspective articulates how discipline communities are bounded by established ways of "being", "doing" and "thinking". These discipline communities or "tribes" (Becher & Trowler 2001), frame the thinking and intellectual activity within forms of intercultural, social and institutional relationships. According to Nissani 1997 (p 203), "a *discipline* can be conveniently defined as any comparatively self-contained and isolated domain of human experience which possesses its own community of experts"

### **Tribes and Prejudice.**

Grinker et al. (2007, p7), acknowledge that while Anthropologists have committed themselves to define culture and attempt to determine where cultures begin and end, it is an extraordinarily difficult task. According to Clifford (1988, p5) the conventional viewpoint suggests that the non-Western world consists of "endangered-authenticities", However Anthropologists and scholars from other disciplines are beginning to question this view point suggesting that cultures or 'tribes' have been in contact with each other since the beginning of time and that the boundaries of cultures are more permeable and fluid than we have previously acknowledged.

Becher's anthropological metaphor of academic 'tribes' is the one which resonates most dramatically within the literature on the subject. There is both an extensive and authoritative

literature which supports Becher's proposition that these tribes are both a prominent and dominant feature of the academic domain. The 'tribes' which Becher speaks of possess a deep rooted bias towards a status quo that perpetrates a certain intolerance of those who are outside the 'tribe'. The 'discipline' or metaphoric 'tribe' maintains its integrity through a rigorous defence of its boundaries. However, anthropology would suggest that in order to ultimately flourish the tribe must replenish itself and its worldview. (Becher, 1994; Clark, 1987; Dervin, 2003; Garkovich, 1982; Gupta & Ferguson, 1992; Hodgson & Reynolds, 2005; Sullivan, 1996).

However, Brew, (2008) argues that while "disciplinary distinctions have been used variously to differentiate forms of academic organisation, differences in knowledge construction and dissemination, as well as the, mores, traditions and practices of academic cultures" (p423), and "have led to insightful understanding of the ways in which social, cultural and intellectual elements of academia combine to produce distinctive traditions and practices" (p424) the changing patterns of higher education and construction and understanding of knowledge itself, means that "anthropological metaphors are having to be stretched". Quinlan, (1999) notes that the differences within disciplines are sometimes greater than the differences between disciplines.

Therefore working within the frame of disciplines does not provide adequate breadth to solve many of the increasingly complex problems we face today. For example in relation to Environmental issues, Foster, (1999, p365) argues that "collaboration across the full range of intellectual disciplines is needed not just to solve but to frame environmental problems". Foster goes on to propose a concept of 'paradisciplinarity' with "a 'besideness' or creative co-presence of mutually respecting real disciplines; its character would be dialogue".

## **CROSS-DISCIPLINARY DISCOURSE**

Interrogating the literature on cross-discipline discourse in higher education presents a challenge defined principally by the scale of the available material. Interpreting its value and meaning in the context of the research question presents the more complex challenge in terms of constructing informed and valuable outcomes, (Fuller & Collier, 2004; Klein, 1990; Lattuca, 2002; Repko, 2008; Stehr, 2006; 2005, 2010). Klein, (2010 p27) suggests that “the growth in interdisciplinary fields is being recognized in traditional taxonomies” and a further body of literature, to that already referenced, moves from defining the differences between discipline cultures to exploring issues of relationship between them. It concerns itself with the development of cross-disciplinary interventions within higher education both as a response to resource demands as well as the demand to enhance existing knowledge and construct new and valuable knowledge. (Fuller, 2003; Huber, 1992; Lengwiler, 2006; O’Reilly, 2009; Sullivan, 2002)

Frodman et al, (2010), in the introduction to *The Oxford Handbook of Interdisciplinarity* acknowledges the negative perceptions that are often cited against interdisciplinary engagement but suggests that “at its best, interdisciplinarity represents an innovation in knowledge production – making knowledge more relevant, balancing incommensurable claims and perspectives, and raising questions concerning the nature and viability of expertise” (xxix).

The literature on cross-disciplinarity is broad and identifies a number of forms of collaboration. A number of terms including “cross-disciplinary,” “multi-disciplinary,” “inter-disciplinary,” and “trans-disciplinary” have repeatedly and increasingly emerged in higher education debates in recent years. Weinberg and Harding (2004, p15) suggest “the idea of “interdisciplinary” teaching and scholarship has become increasingly popular”. This increased popularity and more extensive discourse around this subject demands a clarification on the terminologies themselves.

In much of the early contemporary literature on the subject of interdisciplinarity, Gusdorf (1979, p.129) suggests that there is “no unanimity in the literature concerning the terminology itself” and argues that “if the debate on interdisciplinarity is to serve a practical

purpose, it is important to eliminate unnecessary confusion”. Unfortunately much of the literature continues to voice concerns at the ambiguity in terminology, while some of it provides considered definitions, there is still a lack of a comprehensive definability in the language across disciplines. (Gusdorf, 1977,1979)

### **Discipline based terminology and confusion**

Frieman (2010) reminds us that “interdisciplinarity is usually described as different from disciplinarity: a discipline is said to generate distinct boundaries, separating it from the undisciplined, while interdisciplinarity connotes the crossing of such boundaries” (p5). Frieman, goes on to suggest that disciplinarity and interdisciplinarity are intertwined in a dichotomous relations which helps them define each other (p5). (Klein, 1990; Becher & Trowler, 2001, Sinaceur, 1977). However, in many respects the literature suggests that there are considerable differences around how disciplines relate to each other in the academic context. Although many have tried to define inter-disciplinarity (Kockelmans,1979; Nissani, 1995a; Meyer, 2007; Squires, 1992; Thompson, 2010), it still seems "to defy definition" (Klein, 1990, p.6). Some of the literature suggest inter-disciplinarity breaks down into components such as multi-disciplinarity, pluri-disciplinarity, cross-disciplinarity, and trans-disciplinarity. Other literature suggests that multi-, inter- and trans-disciplinary teaching are categories under the heading of cross-disciplinary teaching. (Holley, 2009; Nissani, 1997)

Within some of the literature on the subject of discipline teaching, the terms are applied indiscriminately, as with Zuo, (1997, p 441) suggesting that the terms “are simply interchangeable”, however, the main body of the existing literature argues that inter-disciplinary work achieves a higher level of integration than multi-disciplinary work. Multi-disciplinary being perceived as preserving the separateness while contributing to a cross-discipline concept.. (Caruana & Oakey, 2004; Cluck, 1980; Klein, 1996; Lattuca, 2003; Nissani, 1997; Rogers et al., 2004; Tonra, 2003; Turner, 1990). Tonra (2003, p5) argues that “trans-disciplinary” is a further development in the disciplinary discourse and goes beyond multi- and inter-disciplinary teaching, “creating its own synthesis of meaning and understanding”. Trans-disciplinary teaching can provide a level of integration that brings the subject to the threshold of being regarded as a new discipline.



According to Wall & Shankar, (2008, p552), “Trans-disciplinary work is considered to be the most evolved form of cross-disciplinary collaboration” where “the work of the team involved is highly integrated and organized according to comprehensive constructs and methods that transcend the conventional academic or professional disciplinary structure”, (p552). A substantial literature has been developing in the area of trans-disciplinarity supporting this perspective. (Madni, 2007; Lattuca, 2002; Giri, 2002; Genosoko, 2003; Hagoel & Kalekin-Fishman, 2002; Rosenfield, 1992, Dyer, 2003; Holley, 2009; Klein, 200, 2010; Lattuca et al., 2004; Oksen et al. 2009).

In education terms interdisciplinary can manifest itself in a diversity of different ways. Caruana & Oakey (2004) indicate that integration, synthesis and synergy are generally seen as the qualities which underpin interdisciplinarity work. Interdisciplinary education should as a consequence of this integration, synthesis and synergies be greater than the disciplinary parts (Klein, 2004). From an educational perspective Toyne, (1993, p99) defines an interdisciplinary course as one which...“makes integrated use of its constituent disciplines in problem-solving and aims to develop the students’ understanding of the nature of each discipline, in terms of its methodological assumptions and limitations”. Lattuca (2003) suggests that interdisciplinary scholarship is a continuum from informed disciplinarity to conceptual interdisciplinarity. Bird (2001), suggests that interdisciplinary is less about integration and more a process of dismantling where knowledge is redefined. Rowland(2002) argues that the boundaries between disciplines are essentially ‘sites of contestation’ between different ‘essential structures’ or regimes of truth’. According to Szostak, (2007), Interdisciplinary courses encourage students to make connections between different elements of their program and help them to recognise the different insights that emerge from different disciplines. They learn how to resolve conflicts between disciplines as well as the experience of working in an inter-disciplinary context.

### **Interdisciplinary Dissent**

However, there are those authors within the literature who are not fully committed to the Interdisciplinary project. According to Grant and Riesman, (1978, p35) as cited in Nissani (1997, p212), an interdisciplinary dialogue runs the risk of going stale. They expressed concern that the interdisciplinary community can become "cut off from fresh infusions of disciplinary knowledge", resulting in a “naive generalism” as a result of having little

discipline training. While not against interdisciplinary activity, Becher (1994) makes a strong case for the characteristics that are in defence of discipline loyalties and the genuine difficulties that can result from interdisciplinary engagement if not constructed effectively. (Tartar, 2005; Young, 2010)

### **Barriers to Interdisciplinary Engagement**

According to Gass, (1979, p. 119) "Disciplines serve not only as a convenient ... way of dividing knowledge into its components, but ... they also serve as a basis for organizing the institution--and hence the professionals engaged in teaching and research--into autonomous fiefs". This discipline orientation is the prevailing structure around which much of the structure and identity within Higher Education institutions is organised. Klein, (1993, p. 193) makes the point that those who associate themselves professionally with cross-disciplinary activity can find themselves in conflict with structures which favour the existing discipline structures. Gusdorf, (1979, p. 147) suggests that "Unlike interdisciplinarity, specialization may be in harmony with Western tendencies to compete, excel, dominate, and control", while interdisciplinarity encourages and necessitates collaboration, co-operation and sharing across knowledge fields, resources and structures, Nissani (1997 p 213) makes the case that within a higher education landscape of limited resources, interdisciplinarians may be perceived as competitors of disciplines. (Bradbeer, 1999; Caruso & Rhoten, 2002)

Another barrier to interdisciplinarity which emerges from the literature is related to communications and socialisation. Those engaged in crossing boundaries must be willing to fully engage in an open discourse and a willingness to invest in understanding other discipline perspectives. Tucker & Rollo (2003) argue that cross-disciplinary working is only successful when those involved have empathy with other discipline colleagues.

Augsburg and Henry (2009) suggest that the discourse on inter-disciplinarity is one "of uncertainty and change" which by its very nature can be a barrier to full acceptance in the in the strong disciplinary structures of the institutions of higher education. (Holley, 2009; Sperber, 2003)

## **BOUNDARY WORK**

An increasing literature is evolving in the area of boundary work within higher education. While most of it focuses on the academic disciplines and the nature of boundary work at and between these disciplines, (Fuller, 1991; Friman, 2010; Frost & Jean, 2000, 2003; Frost et al. 2004; Gieryn, 1983; Harris, 2000; Hung & Chen, 2007; Wackerhausen, 2009), it is not just in the academic disciplines within higher education that boundary work occurs. Boundaries are also blurring in the area of administration and management according to Whitchurch (2008). (Brennan, 2004)

The increasingly complex issues that face us in today's society demands that disciplinary boundaries are crossed. (Friman, 2010; Klein, 2001). Dogan & Pahre, (1990) claim that "truly creative work in many disciplines may have to be done on the boundaries", with resulting interactions which promote intellectual cross-fertilization, a concept, which they refer to as Creative Marginality. Klein (1993, p 185) talks about the shading of one area into another. (Dogan, 1997,1990; duToit et al., 2010; Owens et al., 2006; Sa, 2006)

Friman (2010, p5) refers to distinct boundaries of discipline being generated to separate them from the undisciplined. These boundaries are often used to define the identity of the discipline through both "exclusion and inclusion". (Gieryn, 1993; Klein, 1996; Frickel, 2004; Petts et al., 2008).

At the intersection between disciplines where the boundaries are used for inclusion lies the opportunity to challenge and reframe accepted assumptions and test new possibilities. Zahra & Newey (2009, p1059) suggest that the intersection of academic disciplines provides an important reference for "creative theory building". They argue that consequently, "theory building ...plays a vital role in the development, evolution and reformation of entire disciplines" (p1065).

## **COLLABORATION IN THE ACADEMY**

Support for the benefit of Academic collaboration features across an extensive body of literature around organisational and institutional development, (Creamer, 2003, 2005; Hirsch et al, 2001, 2002; du Toit et al, 2010; Kanter, 1994; Kezar, 2005; Kezar & Lester, 2009; Liedtka, 1996; Senge, 1990, 2000; Tucker & Rollo, 2003, 2006; Rhoten, 2003; John-Steiner et al., 1998; Winberg, 2008) and represents a discourse from a breadth of discipline sources.

Kezar (2005, p833) draws on a definition of collaboration developed by Wood & Grey, (1991, p 437) which suggests that it is “a process in which a group of autonomous stakeholders of an issue domain engage in an interactive process, using shared rules, norms, and structures to act or decide on issues related to that domain”. Kezar (2005, p834) also suggests that as a result of collaboration, relationships develop over time, resulting in the groups who collaborating forming “shared rules, norms and structures”.

Patrick (2006) refers to the “importance of faculty collaboration within and across disciplines” as institutions of higher education become more attuned to the needs of the various stakeholders (p189). Kezar (2005, p855) indicates that in pursuit of collaborative academic development within HEIs, that “relationships and campus networks” are the “most prominent feature in facilitating the developmental process”. A literature exists within the area of collaboration which emphasises the importance of the development of relationships as a critical driving force. (Ring & Van de Ven, 1994; Arino & Torre, 1998; Kanter, 1994; Kezar, 2005).

In the context of interdisciplinary work Collin (2008 p101) highlights “the significance of interpersonal relations when establishing and maintaining collaboration”. Rhoten, (2003) explores issues around interdisciplinary collaboration and outlines the significance of “hubs” and “bridges” (p.6), as enablers of collaboration. Minnis & John-Steiner (2005) argue that “interdisciplinary teaching requires a differentiated team effort” (p 60). It is not enough to plan a course syllabus that recognises the content or modules that are appropriate for inter-disciplinarity to exist. They suggest that “cross-disciplinary communication and integration” must be part of the program plan and make a case for a “bridge role” within interdisciplinary teaching teams, which facilitates in enabling the cross-disciplinary communication and integration to be effective.

However, in a study undertaken by Massy, Wilger & Colbeck (1994) they found collegiality to be “hollowed” with the sense of community very often absent from teaching, meeting and planning agendas. Frost and Jean, (2000), present a qualitative case study which examines ways to strengthen intellectual community through experimenting with organisational structures. Their research suggests that structured conversation between the staff of different disciplines has the potential to strengthen dimensions of faculty culture within the University. However, their conclusions represent a particular position with regard to collaboration and highlight the need to interrogate the subject further. (Connolly et al., 2007)

### **Barriers to Collaboration at the Academy**

The literature also considers the barriers to collaborative engagement which are faced within institutions, citing departmental silos, bureaucratic and hierarchical structures, unions and a variety of other constraining conditions. (John-Steiner et al., 1998; Kanter, 1994; Senge, 1990, 2000; Kezar & Lester, 2009).

Difficulties arise, for example, when members of different departments which have loyalties to well-defined disciplinary interests are required to invest time in collaboration planning and decision-making for an uncertain purpose of breaking new ground (Urbina et al, 1999 in Hagoel & Kalekin-Fishman 2002). Bird (2001,) argues that often those who are committed to disciplinary domains “fiercely defend their spaces, patrol boundaries, and regard those who either intrude or disrupt with suspicion” (p467). (Koester et al., 2008)

Augsburg and Henry (2009, p 26) suggest that the discourse of inter-disciplinarity is one “of uncertainty and change” and as such forms a barrier to full acceptance in the university curriculum with its strong traditional disciplinary structures.

### **Interdisciplinary Engineering Collaboration – a specific and relevant literature**

The literature indicates a number of programs which have begun to explore the potential of Interdisciplinary Collaboration between the ‘Engineering’ and ‘Humanities’. (Borrego & Newswander, 2008; Hirsch et al., 2001; Ullrich & Eppinger, 2000). This literature acknowledges the benefit of interdisciplinary competencies linked to engineering activities.

(Al-Holou et al., 1999; Andrews et al., 1993; Backer & Bates, 2005; Bordogna, 1993; Cummings et al., 2005; Everett et al, 2000; Gorman et al., 1995; McWilliams et al, 2008)

Though much of the integration is linked to aspects of existing curricula there is also an emergent literature which focuses on a broader interdisciplinary integration. (Farris & Lane, 2007; Harrison et al., 2007; Hoit & Ohland, 1998; Mativo & Sirinterlikei, 2005; Ochs et al, 2001; Watkins et al., 1998)

According to Hirsch et al, (2001, p346) the development and structuring of an interdisciplinary curriculum, while essential for any program to succeed, is not in itself sufficient for success. Ultimate success of any interdisciplinary intervention is dependent on the commitment from both academic and administrative staff across the disciplines. Hirsch et al, (2001, p346) attribute success on their Engineering Design and Communications program to “a core group of committed faculty” who meet on a regular basis and discuss assignments, lectures, curriculum, standards etc. Acknowledging that while facilitating the operational aspect of the program it also allows for a better integration of new staff into the program as a clear focus is maintained regarding all aspects of the integration and pedagogy. (Hegarty, 2009; Ochs et al., 2005; Skates, 2003; Trigwell, 2005)

## **IDENTITY**

### **Identity Formation – Introduction**

It is difficult to explore issues of culture without giving consideration to the formation of both personal and group identity. There is a general literature covering the field of *Identity Theory* which explores the meaning and context of this field in both its conceptual meanings and theoretical contexts. (Calhoun, 1994; Snow & Oliver, 1995; Stryker & Burke, 2000) However, identity is a complex and conditional aspect of the human experience. The meaning of the word itself is unclear and contested. Fearon (1999, p1) argues that “despite the vastly increased and broad-ranging interest in “identity”, the concept itself remains somewhat of an enigma” and suggests that “identity” has a “double sense” (p2) with both a “social” and “personal” relevance. The social identity refers to group characteristics, features and attributes, while the personal identity refers to dignity, self-respect and pride. A body of literature exists where the meaning of identity is explored or challenged. (Bloom, 1990; Clifford, 1988; Hall, 1989; Hogg & Abrams, 1988; Herrigel, 1993; Perry, 1975).

In the case of this study, where the intention is to explore a number of disciplines within the Higher Education environment, identity is a central tenet of the discourse. Understanding the way identity is formed can contribute to the development of structures to facilitate and negotiate the transitions occurring in Higher Education and there is a growing literature on the area of identity formation specific to the academic context. (Becher & Trowler, 2001; Burgan, 1998; Burke & Tully, 1977; Donald, 1995; Harris, 2005; Henkel, 2000; Neumann, 2001; Taylor, 1999, 2008; Trede et al, 2011; Trigwell et al. 2005; Trowler & Cooper, 2002; Trowler & Knight, 2000).

However, while identity formation within the academic context may be affected by the transitions in Higher Education it is further complicated by the fact that academics can have multiple identities as suggested by Peel (2005), with the role of teacher, practitioner and researcher as possible manifestations and goes on to argue that the “interplay between the professional and the personal” are “critical to the development of ... [a] sense of self in both its public and private facets” (p496). Stryker & Burke, (2000, p292) suggest that “the greater the number of related identities, the greater the difficulty of dealing simultaneously with relationships among them” and consequently contributing to the complexity of role of being an academic in the contemporary higher education landscape.

## **Personal Identity**

Hanson, (2009, p554) indicates that “self-identity grows out of an individual’s achievements built up over a period of time, expressed as the ‘trajectory of the self’ that the individual gives voice to through a coherent narrative about themselves”. Giddens, (1991), indicates that this narrative, is constructed over time, but is continuously revised in response to changing situations and events. However, personal identity is intrinsically linked to the perception of social or group identity with a comprehensive literature in support of this position. (Bloom, 1990; Calhoun, 1994; Cerulo, 1997; Markus & Kitayama, 1991; Stryker & Burke, 2000).

## **Group Identities**

Group or social identities are manifest in the culture of disciplines and according to Tajfel, (1978 in Ledgerwood & Liviatan, 2010), social identity theory suggests that “group members are motivated to maximise the positive distinctiveness of their own group, compared to others in order to serve basic self-esteem needs”.(p406). Ledgerwood & Levitan (2010) suggest group identity requires a social validation. This validation is derived from social recognition both within and outside the group. They also refer to the concept of identity symbols which act as a means of communicating the group identity and these identity symbols can manifest themselves in a variety of ways and can be represented by customs, language, affiliations, even attire and represent outward expressions of the group identity. In most cases the construction of these discipline orientated identities will be a consequence of the educational and professional experience of the academic, with strong reference to the implicit identity symbols and allegiances of the discipline experience. (Cerulo, 1997)

Lave & Wenger, (1991) as cited in Hughes, (2010) suggest that there is an increasing awareness that learning occurs in social contexts, however, Hughes (2010) indicates that “contrary to received wisdom, the social aspect appears least important for learner engagement while knowledge-related identity congruence is fundamental”.(p.47). While the context of Hughes study is on learner identities, we can make assumptions regarding the influence that learner identity development will subsequently have on academic identity. Academic identities by the very nature of the educational experience can be the result of transformations which occur during the educational development of the academic.



## **Transformative pedagogies and identity construction**

Donnell, (2007, p225), indicates that “transformative pedagogy refers to teaching that fosters collaborative learning and empowers students to think creatively and critically”. Harrell-Levy & Kerpelman (2010, p76) suggest that teachers in classroom environments can, through the use of transformative pedagogies, influence the development of identities. Teachers in higher education can influence, through the nature of their pedagogical approach, the identity formation of their students. Perhaps more significantly is the possibility that the teacher will influence the development of the student identity in any case and consequently give greater consideration to the formative nature of their discipline context.

Perhaps it could be argued that all pedagogies in higher education are transformative pedagogies. The intentionality of the pedagogical framework is to guide students through a transformative process which by its very nature will assist in the formation or transformation of identity. This transformation will be contextualised in both social and knowledge related identity development and contribute to the development of both discipline identity and professional identity.

### **Academic identities.**

The impact of neo-liberalism on the academy is a source of contention in some of the literature on academic identities. Fulton & Holland, (2001), suggest that the continuous erosion of ‘academic autonomy and freedom’, which were defining characteristics of the Higher education system, is “de-professionalising academic staff” and leading to the “proletarianisation of the academy”. While the changing academic environment has impacted heavily on academics’ perception of the teaching role, Henkel (2000) argues that most academics still believe that their educational role is important to their professional identity and that the value of being in Higher Education is linked to a sense of reward associated with seeing students’ progress through into the discipline. Henkel, (2005, p156) suggests that “academic identities are formed and sustained...upon individual and collective values, sense of meaning and self-esteem in the academic profession. These latter are key constructs in a definition of identity derived from communitarian moral philosophy.” (Archer, 2008; Jawitz, 2009; Harman, 2007; Henkel, 2002; Patrick, 2006; Reid et al., 2008)

Henkel (2000) suggests that academic identities are defined by a number of factors which include, discipline, the institution and a sense of profession. Wenger (1998) present a more generalist view of academic identity as the way meanings are negotiated in the academic workplace setting. The discipline within the academy acts as the cultural socialiser for academics (Becher & Trowler, 2001; Henkel, 2000) and the allegiance to discipline being a central tenet of the academic and professional identities of educators and researchers. Academic identity is influenced by both the academic discipline and the institution. These characteristics are repetitive elements in the literature supporting identity development. (Austin, 1990, 1994; Becher & Trowler, 2001; Brennan, 2004, 2006; Brennan & Locke, 2006; Clark, 1987; Garratt & Hammersley-Fletcher, 2009; Henkel, 2000, 2002; Kogan, 2000; Neumann, 2001; Silver, 2003). Becher & Trowler (2001, p47) regard the discipline as the primary area within which academics “construct their identities, their values, the knowledge base of their work, their modes of working and their self-esteem”.

There is a recognition in some of the literature of a distinction between the traditional ‘academic identities’ discourse focussing on the generalities of the identities in a global context and a recognition of the lived realities particular to the individual department in its local context. (Clegg, 2008; Knight & Trowler, 2001). Hanson, (2009, p555) suggests that this perspective offers a more positive outlook for academics identities and provides for a better understanding of the complexity and diversity of these types of identity.

McWilliam et al., (2008) argue that in the current climate the neo-liberalist agenda is having a dramatic influence on the nature of academic life and that academic identity is being forced to change in order to meet a new set of values. Castells, (1997) suggests that during the 20<sup>th</sup> century academics could be considered as members of interconnected communities, i.e. disciplines and higher education institutions, which afforded them stable and legitimising identities (In Henkel, 2005). However, some of the literature suggests that the increasing tensions resulting from the changing higher education landscape have contributed to an erosion of this stability and that academic identities are under constant pressure. (Barnett & DiNapoli, 2008; Cheng, 2009; Churchman & King, 2011; Clegg, 2008; Hardy, 2011; Henkel, 2002, 2005; Jawitz, 2009; Karran, 2011; Winter, 2009).

There is an extensive literature developing on the changing nature of academic work within higher education and specifically around the effect of the new forms of managerialism within

higher education and the effect this is having on academic identities. (Archer, 2008; Barnett, 1999,2003; Barnett & Di Napoli, 2008; Clegg, 2007, 2008; Henkel, 2000, 2002, 2005; Henkel & Vabø, 2006; Harris, 2005; OECD, 2004; Macfarlane, 2005; Waller, 2004; Winter, 2009).

Academic identity is a central theme in the discussion around culture in the academy. Traditionally much of the literature on the subject dealt with the student perspective and the development of their identities within academia. Academics appear to have had little interest in interrogating their own identities in the past. However, there is an increasing discourse on the professional academic and the construction of their identities. The structuring context for the discourse on identity is varied. A number of researchers view literacies as central to academic identity (Lea & Stierer, 2000, 2009) and to the ‘discoursal construction of identity’, (Ivanic, 1998, 2006). Other perspectives on academic identity include Clegg (2008, p 329), who proposes academic identity, ‘not as a fixed property, but as part of the lived complexity of a person’s project and their ways of being in those sites which are constituted as being part of the academic’. This perspective suggests a breadth of influences which inform the identity of the academic.

Some of the literature draws on situated learning theory and communities of practice to explore how academic identity is constructed and developed. (Fuller et al, 2005; Jawitz, 2009; Trowler & Knight, 2000). According to Jawitz (2009, p243) “Identity is built around social engagement and is constantly being renegotiated as individuals move through different forms of participation”. Musselin, (2007) argues that “the academic profession has always been in the process of change” (p175) suggesting that accounts of academic experience over the past continuously reflect a pre-occupation with change.

Jawitz, (2009, p247) suggests that there is a difference between practitioner and academic identities and that this difference reflects “a difference in values between those committed to developing the profession and those committed to developing the discipline within the field of higher education”. This tension between professional and academic identities provides another catalyst for academic identity formation. This can be a particular identity issue in a department of design where there can be a strong link between professional and academic identities at all levels of both contexts. Design academics traditionally follow a career trajectory that takes them from professional practice into academic practice. However, Jawitz,

(2009, p50) suggests that research may form a non-professional route to the discipline. This consequently could influence future academic identity within design education.

The general literature on Academic Life provides diverse views on its place and motivation. Weber (1918), suggests that teaching is a vocation while Hogan (2003) argues that it is a way of life, but suggests that “teaching as an occupation has rarely enough enjoyed the freedom to conduct its affairs in accordance with its practitioners’ views on how the best interests of learning are to be understood and advanced”(p 207) and cites Boyd & King, (1972, p101) in *The History of Western Education*, in their view that “The clerical monopoly of education established in the age of transition from the ancient world to the modern lasted for more than a thousand years, and its effects on the intellectual life of Europe were tremendous. The most obvious result was the general restriction of learning within boundaries fixed by the Church’s interests and doctrines”. It can be argued that identities in the academic life will be influenced and shaped by a variety of influences, including the dominant doctrines boundaries, vocational and philosophical perspectives on teaching and learning as well as the characteristics of the discipline and institutional structure. (Altbach, 2001, 2009; Adams, 1998; Clark, 1987)

However, when we approach the literature on the subject of Academic work and whether it constitutes a profession we once again find a varied perception of both concept and vocabulary that determines the meaning of profession itself. Webb and Webb (1917, p4), position it in its academic context and describe a profession as “a vocation founded upon specialised educational training”. However, there is another literature which asserts that academic work in higher education is by its very nature a ‘professional’ activity in its own right and needs then to be considered within the context of the Professional Practice of the Academy. (Nixon, 1996, 2001, 2001a, 2004; Trevitt & Perera, 2009; Trede et al., 2011).

Piper (1994) argues that academe should not be considered as a single profession but instead be seen as a range of professions bound to disciplinary identity and that academe differs from traditional professions because it lacks a comprehensive training and qualification for higher education training. The literature interrogating the question over whether academic work constitutes a profession has been interrogated by a number of researchers. (Altbach, 1996; Cheng, 2009; Enders, 2000; Kolsaker,2008; Nixon, 1996, 2001; Nixon et al, 2001).

Churchman & King (2009) explore a number of the issues around identity perspectives in HEIs and academics workplace identity in particular acknowledging the “levels of dissatisfaction and stress among academic staff” (p508). (Pienaar & Bester, 2006; Hardy, 2010; Newton, 2002). This dissatisfaction and stress is linked in many cases to the apparent loss of control and academic freedom perceived to have been inherent within academia up until recently. While much of the literature on the subject describes the negative context of massification and globalisation, there is also a relevant literature that argues that academics still have considerable control over their work (Delanty, 2008) and that academic identities are in many respects expanding, (Clegg, 2008; check page reference and actual reference; Archer, 2008).

While this research focuses on academics within higher education institutions, it is worth noting that the process of discipline identity formation begins early on in the students’ formation. Kapp & Bangeni (2010) outline that in their research investigations on students perception of disciplines that “Whilst not fully comfortable in their disciplines, students nevertheless expressed a growing allegiance to the values and culture of the discipline”, (p591) and go on to suggest that students reflections showed an awareness of disciplinary differences.

### **Professional Identity**

An extensive general literature exists on the subject of professional identity, (Baxter & Brumfitt, 2008; Burn, 2007; Chappell et al., 2003; Colbeck, 2008; D’Cruz, 2007; Downey & Lucena, 2004; Elliot and du Gay, 2009; Epstein, 1978; Eraut et al., 2004; Gerholm, 1990; Giddens, 1991; Hymans, 2008; Knight et al., 2006; Krejsler, 2005; Lave & Wenger, 1991; Lawlor, 2008; Lueddeka, 2003; McWilliam et al., 1994; Piper, 1994; Reid et al., 2008; Shreeve, 2010; Smit et al., 2010; Wenger, 1998; Whitechurch, 2009; Webb & Webb, 1917). Trede et al (2011) review the general literature on professional identity relating to teaching approaches and universities’ role in the development of professional identity and provide a focus for this study. Gieryn, (1993, p782) argues that disciplines legitimise the contrast with other groups and as such are a means to sustaining professions.

However, when we interrogate this literature it becomes clear that the term ‘professional’ is used in a variety of ways across the literature to provide a context for identity. These contexts

include, professional development, professional socialisation, professional education, professional formation, professional learning. All explore the “sense of being a professional” (Paterson et al., (2002, p6). Trede et al., (2011, p10) suggest that the broad literature on this subject indicates “that professional identity is a way of being and a lens to evaluate, learn and make sense of practice”.

Silver, (2003, p159) argues that faculties and departments are proxies for academic and professional identities, and often compete with, or ‘veto’, the interests and concerns of the institution. However, within Higher Education there is also a literature which concerns itself with the move towards academic professionalization. (Archer, 2008; Bryson & Blackwell, 2001,2006; Nixon, 2001; Slaughter, 2001; Evetts, 2003; D’Cruz, 2007; D’Andrea & Gosling, 2005; Gleeson & Knights, 2006, Whitechurch, 2008, 2009). Traditionally academics in higher education have had little preparation for their teaching role and with the move in many higher education institutions towards academic professionalism this move, according to Quinn (2011, p2), has been “regarded with deep suspicion by some”. Quinn (2011, p2) also argues that within this literature most of “critique and contestation centres on fear of loss of autonomy and intellectual freedom”. (Crittendon, 1977)

While the central tenet of this research does not reside within the field of professional identity its relevance to discipline, discipline culture and how individuals and communities relate to each other is significant in contextualising the research presented. In this regard there is recognition within some of the literature that professional development is linked to the department as a community of practice, Hunter, Laursen & Seymour (2007, p67) suggest that “Identity development and professional socialisation are framed as a process of negotiated meaning-making within a community of practice”, (Gibbs, 1996; Knight & Trowler, 2001). More of the literature argues for cross-disciplinary staff development with an emphasis on the learning that occurs from the diversity of participation. (D’Andrea & Gosling, 2005; Davidson, 2004; Rowland, 1999, 2000).

## DESIGN CONTEXT

Perhaps an insight into the world of design may provide a context for the subsequent study (and understanding of the character) of the BSc. in Product design. Design is not just a discipline; it manifests itself as both object and subject, as concept and realisation, as idea and artefact. As Heskett (2002) suggests, 'design' has many levels of meaning in common use, but for a formal explanation, he goes on to propose design "as the human capacity to shape and make our environment in ways without precedent in nature, to serve our needs and give meaning to our lives" (p.5). The inherent complexity suggested is one of the qualities which what defines us as a species. Design marks our illustrious evolution from primitive to modern through innovation and invention, through our ability to harness the resources around us and reshape them to our needs, and desires.

Like so many of the terms and vocabularies in use around disciplines, differences in meaning and perceptions of meaning have a significant role to play in any negotiated understanding of collaborative interventions. Findeli (2001) argues that defining design "depends on whether design is considered to be an idea, a knowledge, a project, a process, a product, or even a way-of being", (p29). Terzidis (2007) argues that "design is a conceptual activity involving formulating an idea intended to be expressed in a visible form or carried into action." (p69). What design is, its meaning, its role, and its ways of being and doing are the subject of an extensive literature which provides substance for the "culture of design" in contemporary society. (Buchanan, 1992, 2001, 2004; Cross, 1999, 2001, 2002; Gero, 1996; Heskett, 2001; Buchanan & Margolin, 1995; Meurer, 2001; Whitney, 1988).

The traditional pedagogy associated with design has generally emerged out of schools of art and design. While many schools internationally have followed this traditional "art and design" pedagogy, others are positioned more within the engineering spectrum. As with so many aspects of higher education the changing dynamics resulting from globalisation are impacting on the way design education and the design profession are developing. (Buchanan, 2004; Meurer, 2001,). As indicated by Findeli (1995) design itself is at the intersection of technology, art and science. Design is a field of both convergence and divergence.

There has been a growing acceptance of design on its own terms, a growing acknowledgement and articulation of design as a discipline. We have realised that we do not have to turn design into an imitation of science; neither do we have to treat design as a mysterious, ineffable art. We recognize that design has its own distinct intellectual culture. (Cross, 2002, p1)

Cross (2002) advocates the idea of 'design as a discipline', based upon a 'science of design'. and refers to the work of Simon, (1969, p82) who proposed that 'the science of design' could form a fundamental, common ground of intellectual endeavour and communication across the arts, sciences and technology. Simon suggests that the study of design could be an interdisciplinary study and accessible to all those involved in the creative activity of making the artificial world. Cross (1999) also advocated the view of design as a distinct culture, one in which he proposes that the culture of design can be articulated in a similar manner to Snow's (1969) "two cultures" of Arts and Sciences from the perspective of Western intellectual tradition.

### **Culture of Design:**

In the introduction to "The Idea of Design", (1995, xiii), Buchanan suggest that the "planning of products requires the integration of knowledge from many fields and disciplines, directed towards the solution of wicked problems of indeterminacy". This fundamental conception of integration, collaboration and cross-disciplinary engagement is central to the culture of design. (Tucker & Rollo, 2003). Julier, (2006) argues for the need to undertake academic study in the field of Design Culture as a means to providing a "conceptual framework that addresses contemporary problematic of design and its social meanings in the contexts of complexity" (p76).

Product design has its roots in the industrial revolution as Sparke (1986), suggests the "discovery of steam-power and its multiple uses had inspired the invention of numerous new machine-tools and production techniques" (p3) leading to a situation where "the desired pattern had to be fully planned and broken down into its component parts before manufacturing began"(p4). Within the world of 'object' design, 'Product designer' and 'industrial designer' are terms used to describe these professional role, Heskett (2002, p56-57) refers to these titles as used within design practice as being "virtually interchangeable"



and that both “claim a role in thinking about product form in terms of the relationship between technology and users”. Heskett also refers to the design of “complex objects” which can “require multidisciplinary teams involving many disciplines working in close cooperation”.

As the complexity of products increases so too does the complexity of the multidisciplinary challenges that face the designer. The complexity is multi layered, from the globalisation of consumer goods, to lifestyle challenges, from communicating social and political symbolism to meeting the demands of sustainability. Design thinking, design science and democratic design have broadened the conceptual pallet of design education and practice. Social and ethical concerns are expressed in the writings of Papenek, Whitley and Fry. Design methods, design management and design planning have all crowded into the uncertain space of design discourse. (Heskett, 2002; Papanek, 1971, 1995; Whitley, 1993; Fry, 2009)

### **Design Education**

In his essay on Moholy-Nagy’s Design Pedagogy in Chicago (1937-46), Findeli (1995) suggests that whatever the underlying model of any design education program, there will be a common characteristic, they will “insist upon the multidisciplinary nature of design” (p29). Walker (1989) suggests that ‘Interdisciplinary’ is a word which is increasingly associated with design as design occurs in various arts and industries as well as being the vehicle for synthesising information derived from a range of disciplines.

Eppinger & Kressy (2002), outline the significance of the interdisciplinary aspect to product design education in their description of a graduate course they teach for students at the Massachusetts Institute of Technology (MIT) and the Rhode Island School of Design (RISD). The program is aimed at students who are studying engineering design, manufacturing, management, and industrial design. They indicate that while no student possesses all the disciplinary skills to complete an entire product development effort. Through the projects, they realize the necessity of each other’s disciplines and therefore the value of collaboration.

Product development is vital to the achievement of business success. In the quest to satisfy increasingly sophisticated market needs, cutting edge product development must rely heavily on the contribution of many disciplines. Therefore, we believe an

interdisciplinary setting is the right one in which to train the next generation of product development professionals. (p 60)

Slack (2006, p6) suggests that Product Design is “a generic term for the creation of an object that originates from design ideas – in the form of drawings, sketches, prototypes or models – through a process of design that can extend into the objects production, logistics, and marketing”. The product design process involves stages of product planning, concept design, product development, product styling and detail design (Baxter 1995). Owen (1998) has suggested that product design is more concerned with ‘making’ and aesthetic and cultural judgements than is typical for (mechanical) engineering. However an extensive literature explores issues of design integration into engineering orientated education programs. (Amon et al., 1995; de Vere et al., 2010; Hirsch et al., 2002; Thompson, 2002; Whitney, 1988), as well as integration of creativity. (Court, 1998; Dhillon, 2006; Ochs et al., 2001, 2002, 2003; Schuler, 1994; Silva et al., 2009)

Buchanan, (2004), acknowledges a shift of design education into the universities or at the very least increased linkages between traditional art and design schools seeking closer ties with universities or with the different disciplines that make up university culture. “We may disagree about which are the most important disciplines for designers to understand—cognitive psychology, engineering, computer science, anthropology, drama, rhetoric, marketing, and so forth—but there is no dispute in the West that knowledge from other disciplines must now inform design thinking.”(p35). Designers must be able to understand and work closely with colleagues across a range of disciplines.

## CURRICULUM

Having already explored the general literature on discipline and cross-discipline contexts this section of the literature review explores the relationship between these and curricula. Neumann, Parry and Becher (2002) explore the influence of discipline on the nature of knowledge, curriculum, learning outcomes and assessment. Caruana & Oakey, (2004) review differing conceptualisations of the academic discipline as well as multi and interdisciplinary learning and teaching suggesting that while

It may initially be assumed that academics deploying a multidisciplinary perspective remain essentially focussed on the discipline and their differing vantage points, whereas participants in interdisciplinary work purposefully seek integration of disciplinary perspectives and thus engage in more cross-communication and cross-coordination. (p5)

Huber (1992) suggests that there is a general theoretical awareness that some of the problems of knowledge construction are neglected because they "fail to fit in with disciplinary boundaries thus falling in the interstices between them". (p.285) (Campbell, 1969; Kockelmans, 1979). Wall & Shankar, (2008, p551) suggest that within academic and professional circles cross-disciplinary collaboration is being promoted as a means to generating new knowledge that can be used in the resolution of real world problems. This view is supported in a broad literature from various fields, (Balsiger, 2004; Bruce et al; 2004; Hammer & Soderqvist, 2001; Rosenfield, 1992; Turner, 1990).

Kluser & Schmidt (1990) suggest that disciplinary differences in teaching and learning are linked to the organising principles of the University and argue that "despite the manifest differences between the various disciplines and courses of study, the essential feature of a university education is that its fundamental guiding principles are common to all fields of study, while discipline specific differences are of secondary importance" (p305). The curriculum is the binding element where the significance of disciplinary knowledge and the opportunity for collaboration across a multitude of fields and domains can be recognised and structured in a meaningful and practical way. According to Kluser & Schmidt (1990, p316) "disciplines develop grammars of activity as their cognitive habitus". An effective curriculum

presents the structure to negotiate these grammars, vocabularies, differences and ways of doing and knowing. (Foster, 1999; Toyne, 1993)

However, concern is expressed within a section of the literature on curricula. According to Griffin (1997, p3) “knowledge as we have known it in the academy, is coming to an end.” Bridges, (2000) suggests the changes within the Higher Education landscape are resulting in an informal curriculum and references the ongoing impact of modularisation on the curriculum. (Williams & Fry, 1994)

Nissani (1997, p210) reminds us that it is not possible to become an expert in everything. Knowledge is constructed across a multitude of disciplines and its application in the solving of problems or in the creation of new possibilities requires us to understand how little we know and how little we can ever know. This awareness presents us with the capacity to exploit what we do know as well as the knowing of others across a variety of fields, domains and disciplines. A growing literature looks at the beliefs about knowledge and knowing within disciplines. (Carey & Smith, 1993; Lampart, 1990; Szeto, 2010).

Scardamalia & Bereiter (2006, p98) suggest that knowledge building efforts should focus on “refashioning education in a fundamental way” and developing a knowledge building culture with increased emphasis on “knowledge of” in contrast to the traditional “knowledge about” subjects. They suggest the building of a stronger “knowledge of” requires knowledge to be organised around problems rather than topics and so provides a deeper understanding. The relevance of this discourse to the development of the curriculum is extensively explored by Scardamalia & Bereiter (2006).

Hofer (2000) suggests that most of the work on personal epistemologies has made the assumption that the beliefs and theories that are held about knowledge and knowing transcend domains or disciplines. Schommer & Walker (1995) argue that in general epistemological beliefs tend to be domain independent. However, Hofer goes on to propose that these assumptions do not hold true in all studies on the subject. (Jehng et al., 1993; King & Kitchener, 1994; Paulsen & Wells, 1998). Hofer (2000, p383) argues that in fact “epistemological differences to exist” and are “part of the defining nature of the disciplines” and are likely to increase as the domain expertise develops. (Donald, 1990, 1995; Hofer & Pinrich, 1997a, 1997b, 2002; Langer, 1994; Roth & Roychoudhury, 1994).

## KNOWLEDGE

This literature also reflects on issues to do with curricula, teaching and assessment, consequently grounding the disciplines and their cultures in the direct context of student and learning. Hyde (1995) in his paper on 'An Ontological Approach to Education' talks about the way in which education achieves its results. This paper draws on the thinking of a number of postmodern philosophers, including Heidegger, Rorty and Gadamer. Hyde (1995) distinguishes between an approach to education which is ontological in nature as "distinct from the traditional epistemological paradigm in which educating is a process of increasing knowledge" (p4). The relevance of this material in the context of my own research is in terms of the positionality with regard to the ontological contextualisation of the different disciplines that contribute to higher education. This is considered in parallel with referencing the epistemological paradigm Hyde (1995) refers to.

Buehl and Alexander (2006) in 'Examining the dual nature of epistemological beliefs' suggest that "with respect to the specificity and structure of epistemological beliefs, we contend that beliefs about knowledge are reflective of the multidimensional, multilayered, and interactive nature of knowledge" (p.28). This paper is relevant to my research topic in terms of its reflections on the dynamics of knowledge across disciplines. Buehl and Alexander (2006, p29) refer to the work of Alexander & Murphy (1998) outlining that "In the educational literature, as well as in everyday parlance, the deceptively simple word knowledge stands in lieu of a cadre of complex, diverse, and interrelated concepts" (p.29). Further reference is made in this paper to Buehl et al., (2002) and to evidence of domain-specific epistemological beliefs in college students when beliefs were assessed with a domain-specific instrument. They go on to propose that "students' beliefs become more differentiated and domain specific as they age and have greater experience with different domains" and that "as the lines between academic domains become more defined...that students beliefs also become more differentiated"(p.416).

Hammer and Elbys (2002,p1), paper 'On the Form of a personal Epistemology' argue "that current perspectives on epistemologies are problematic in their form, or "ontology". They outline the traditional perspectives and go on to propose an alternative view of "students' epistemological knowledge as made up of a range of epistemological resources, the activation

of which depends on context. Interrogating the ontology's and epistemologies in terms of context enables a different perspective on discipline cultures to emerge.

A broad base of literature on the subject of research, theory and methods associated with the study of education exists. (Bakhtin, 1981; Buehl & Alexander, 2002, 2006; Gerholm, 1985; Scardamalia & Bereiter, 2006; Wells, 1999, 2002, 2007). Its value is twofold for this research, firstly it needs to be interrogated to support the research methods used to investigate the research question, and secondly, it needs to be interrogated to scaffold the case study itself.

### **Constructivist Pedagogy**

The purpose of examining the area of constructivist pedagogy in relation to this study is to establish a baseline understanding of the differences in approach in teaching and learning that have evolved within and across disciplines. Within the context of this study a substantial literature on the subject has been interrogated across a number of academic areas in order to establish a working consensus that is appropriate and relevant to the BSc. in Product Design. (Clements, 1997; Lampart, 2001; Longino, 1990, 2002; Somekh, 1994; Viiri, 1996). In addition to the breadth of investigation there is also a small, though developing literature which looks at the area of design and engineering which contributes to a deeper understanding of pedagogic issues on the subject of this study (Fagan, 2010; Fleming et al., 2007; Kitcher, 2001; Thompson, 2000; Walker & Lambert, 1995).

Phillips (2000) suggests that there are two distinct forms of constructivism, Social constructionism or social constructivism on the one hand and psychological constructivism on the other. Social constructivism centres on a variety of ways in which “groups of people form understanding and formal knowledge about their world” (Richardson, 2003, p1624), with a particular focus on how formal knowledge is generated or determined, while with psychological constructivism “the development of meaning may take place within a social group that affords its individual members the opportunity to share and provide warrant for these meanings” (p1625) with a focus on the ways that meaning is created within the individual or group consciousness. (Richardson, 1997)

The recent literature on constructivism has focussed attention on education scholarship, practitioner preparation, and policy formation (MacKinnon & Scarff-Seatter, 1997; Richardson, 1997; Teets & Starnes, 1996). Fleming et al (2007, p10) suggests that Dewey, Bruner, Piaget, Vygotsky, and Gardner embraced constructivist learning theory and methods, and represent those theorists as the most commonly associated with concepts of constructivist learning. (Vygotsky, 1978, 1981, 1987, 1991)

Constructivist theory suggests that learning is more successful when we construct our own meaning from our experiences and develop our own solutions to problems. (Kim, 2001; Richardson, 2003; Wells, 2002). According to its fundamental principles, constructivism maintains that understanding and knowledge are constructed in the mind of the individual learner. (von Glasersfeld, 1995). We create our own understanding based on an interaction between what we already know and believe and the ideas and knowledge that we come into contact with. (Resnick, 1989).

Some of the literature however suggests that Constructivism itself is not a pedagogical method, but can be more accurately regarded as a model of knowing, which can be used to build a theory of learning (Clements, 1997; Philips, 2000). A number of studies have been undertaken to look at the constructivist teaching in higher education institutions with similar conclusions which suggest that student centered teaching provided better remembering and understanding than teacher centered teaching methods. (Viiri, 1996; Lord, 1997; Christianson & Fischer, 1999). Richardson (1997, p3) suggests the difficulty in translating a descriptive theory of learning into the practice of teaching occurs because teaching takes place in contexts and is not a direct translation of a psychological process. Knowledge is acquired through involvement with content instead of imitation or repetition (Kroll & LaBoskey, 1996).

Some of the literature suggests the importance of teacher educators' reflecting constructivist approaches that engage students in interdisciplinary exploration, collaborative activity, and field-based opportunities for experiential learning, reflection, and self-examination (Kaufman, 1996; Kroll & LaBosky, 1996) if future academics are to be able to employ these strategies in educational settings.

Richardson, (2003, p1628) suggests that much of the focus of constructivist pedagogy is on “a specific domain or discipline”, with the objective being to develop the learner within that domain or discipline. (Lampart, 2001; Shulman & Quinlan, 1996). Walker & Lambert (1995), suggest that "constructivism possesses a richness of thought, a different world view, that offers a sense of possibility rather than limitation to human growth and development.". Exploiting this possibility aspect of constructivist pedagogy and exploring across disciplines instead of just within disciplines offers extensive opportunities for pedagogic learning and knowing. According to Walker & Lambert, (1995 p. 1) “constructivism is a theory of learning, and it is also a theory of knowing. It is an epistemological concept that draws from a variety of fields, including philosophy, psychology, and science”

### **Social Constructivism**

Thompson (2000) indicates that “from a Social Constructivist perspective, collective activity and social interaction are given, predating any individual’s participation in it. The individual accommodates to social meaning and practice.” (p.425). Constructing knowledge in an educational setting requires a commitment by teachers to a critical discourse both between academics and between academics and students. Scardamalia & Bereiter (2006) while recognising that “empirical findings and other products of inquiry only become contribution to community knowledge when they are brought into public discourse” (p108) they assert that “the state of public knowledge in a community only exists in the discourse of that community, and the progress of knowledge just is the progress of knowledge-building discourse” (p108). While these contentions appear to be at odds with each other they both require a commitment to content and this content contributes to the knowledge building discourse.

While Social Constructivism is often considered to be in opposition to the philosophy of scientific practice, Fagan (2010, p92) argues that “one variety of Social Constructivism, focused on epistemic justification, can be a basis for critical epistemology of science practice, while normative accounts that reject this variety of social constructivism cannot”. (Kitcher, 2001; Longino, 1990, 2002). Central to this discourse is the process of developing knowledge by making meaning from new experiences is influenced by personal introspection and reflection, as well as by social interactions (Slavin, 2006; Walker & Lambert, 1995).



## **Co-constructing knowledge through dialogue**

Wells (2007) indicates that the idea of knowledge construction through dialogue is in itself not new. What has evolved, however, in recent discourse is “the importance of dialogue as the essential means by which knowledge is advanced within any society” (p264). (Bakhtin, 1981, 1986; Franklin, 1996; Garrison, 1993; Vygotsky, 1978, 1981, 1987, 1999; Wells, 1999; von Glasersfeld, 1995). Franklin (1996) suggests that knowledge is constructed in the discourse that occurs between people who are doing things together. Wells (2007, p269) cites Popper & Eccles (1977, p122), who suggest that what is known only comes alive when it is put to the test through either action or discussion of its implications and effect. This aspect of knowledge construction is an essential characteristic of problem solving conditions.

## **Learning & Teaching in different disciplines**

When we consider then that there is evidence of discipline differentiation in teaching style, this inevitable manifests itself in the learning context. An extensive literature exists on how approaches to teaching are affected by discipline and teaching context. (Drew & Trigwell, 2003; Gibbs & Coffey, 2004; Meyler & Eley, 2006; Prosser & Trigwell, 2006; Trigwell, 2005; Trigwell et al., 2005; Trigwell & Prosser, 2004) and a related literature which explores issues around the training on teaching in higher education and how this is linked to approaches to teaching (Postareff et al., 2007). The focus of this literature is on defining the differences that exist between different categories of disciplines. Understanding the differences can facilitate in negotiating collaboration between the disciplines.

Lindblom-Ylänne et al. (2006), discuss the relationship between teaching and discipline. This relationship is of particular interest when we have a variety of disciplines contributing to a program. Their study which centred on academic staff in higher education institutes in the UK and Finland provides evidence that teachers who teach in the ‘hard’ disciplines such as the physical sciences and engineering are more likely to use a ‘teacher-centred’ approach to their subject while those from the ‘soft’ disciplines such as the social sciences and humanities are more likely to use a student-centred approach to their teaching. These findings are in line with earlier investigations outlined in Lueddeke (2003) and Trigwell (2002). This difference in teaching approach is particularly relevant when the number of discipline inputs on a program increases. Acknowledging the nature of these differences can enable a discourse to

occur and enable a pedagogic consensus to be reached which enabled the differences be acknowledged and managed.

Neumann *et al.* (2002) describes teaching in 'hard' disciplines as involving mainly centred on mass lectures and problem-based seminars, or on simulations and professional case studies, while the 'soft', disciplines generally involve more discussion, debate and class meetings and tutorial teaching approaches. (Lueddeke, 2003; Trigwell, 2002; Lindblom-Ylance *et al.*, 2006)

However, another literature poses questions about the accepted wisdom of the conceptions of teaching in Higher Education. While accepting that student centred methods are more effective than teacher centred methods Devlin (2006) challenges aspects of the current accepted norms and argues that not all of the research on the subject is as convincing as it first seems. (Kember, 2000).

## GENERAL OBSERVATIONS FROM THE LITERATURE

As already indicated, it was appropriate in the context of the research question to interrogate a literature that was spread across a broad range of disciplines in order to draw inferences from an extensive and diverse base of content. A consequence of investigating the breadth of literature pertaining to the research question has resulted in observations that characterise the nature and perhaps dilemma of researching across disciplines. The following observations have emerged:

- (1) Research on issues or contexts tend to be undertaken within fields of study, except in major fields, the cross referencing within the literatures is limited. Many academics and researchers are exploring and expressing situations, circumstances and issues independent of their peers, without consideration to the broader context. i.e. ‘paradigm development’ where literatures around the same concept exist in discrete and unconnected literatures depending on the discipline. I.e. Kuhn (1996), in relation to science and MacKenzie and House (1978), in relation to social science.
- (2) Seminal literature can too often remain isolated by the boundaries of a discipline even when addressing issues relevant to other fields.
- (3) Research across disciplines and exploring beyond the ‘prescribed’ and appropriate boundaries is a dangerous and difficult task. In the strong neo-liberal climate maintaining a clear and prescribed focus is perceived as an important characteristic of the academic/researcher.
- (4) While we can acknowledge that a substantial body of the available literature in existence will not travel across all boundaries, much of it in fact will stay rooted within clearly definable context, there is a need to open a greater discourse on principles, methods, taxonomies, etc to enable a greater translation of content rich concepts, ideas, methods and ways of knowing and engaging.
- (5) While there is a considerable literature around discipline, cross-disciplinarity and related topics, there remains few journals or publications which enable a cross-disciplinary voice that could be heard by other disciplines.

**Emerging themes.**

A number of general themes emerge through the research investigation. These themes have been captured in the general headings under which the literature has been organised. (See Figure 1). These themes have consequently been central to the design of the questionnaires which set out to interrogate academic and management staff of the BSc. in Product Design.

## **CHAPTER 3**

### **RESEARCH DESIGN**

#### **THEORETICAL PERSPECTIVES**

##### **Context for the research: Epistemology and Theoretical perspective**

Ontology can be described as the study of what exists and the nature of what exists. Epistemology can be described as the study of knowledge and justification. In many respects the epistemology and theoretical perspective on this research are central to the question itself. Taking a Social Constructivist perspective it is clear that the ontological position asserts the central role of the social actor. In placing the social actor at the centre of the knowledge construction it becomes a logical assertion that the knowledge and meaning defined within a field or discipline will inform that construction of knowledge and the position taken by the social actor in defence of that knowledge. Social Constructivism refers to an individual's making meaning of knowledge within a social context (Vygotsky, 1987).

Within the context of this research knowledge is derived from a multiple of discipline perspectives. Assimilation of these perspectives into a cohesive body of knowledge is the underlying challenge. The relationship between the existing knowledge structure and making meaning through the assimilation of multiple perspectives presents considerable opportunity for new knowledge construction.

From a philosophical and theoretical viewpoint this research will be underpinned within a Social Constructivist ontology. People within a group construct group knowledge and this knowledge then becomes part of the group. The ontological position of Social Constructivism at a fundamental level is that reality is unknowable and requires external validation of the social group to form truths. The epistemological nature of Social Constructivism is that knowledge is both social and experimental as well as being subjective and relative. Knowledge can be different between different groups and is defined within the group. In accepting this position as the theoretical framework underpinning this research question, it is acknowledged that disciplines, their cultures and their identities are manifest as a result of the meaning that is constructed from within the discipline group.

Kim (2001) outlines three assumptions about reality, knowledge, and learning in the context of social constructivism. That Social Constructivists believe that (a) “reality is constructed through human activity”. (b) “Knowledge is a human product, and is socially and culturally constructed” and that humans “create meaning through their interactions with each other and with the environment they live in”, and (c) “learning as a social process”, and that “meaningful learning occurs when individuals are engaged in social activities”

Learning is iterative in nature requiring, discussion, debate, flexibility and reflection among other qualities. Since "academic knowledge consists in descriptions of the world, and therefore comes to be known through a discursive interaction between teacher and student" (Laurillard, 1993, p89) we can also accept that the nature of the knowledge is dependent on the context of the discursive interaction.

It is important to acknowledge that while Social Constructivism may provide a substantial theoretical base for this research that no single theoretical approach is likely to achieve the broad range of educational outcomes required from the complex issues within discipline groups in higher education.

## **RESEARCH METHODOLOGY**

The nature of the research question suggests that the primary research methodology has been considered under the flag of ethnography. Cresswell (2008) suggests that ethnography is appropriate when “you have a culture sharing group to study – one that has been together for some time and has developed shared values, beliefs, and language” (473). The focus of this research is on a number of ‘groups’, each with identifiable separate discipline cultures, developing a new cultural dynamic within an overall institutional culture. However, while the format of this research was originally to be a case study it evolved into a mixed methods study in response to the development of the data collection methods.

The data collection method for the study involved the use of narrative questionnaires in addition to the interrogation of courses documentation and reports. The intention was to illicit the personal accounts of the individuals who have been at the centre of the BSc in Product

Design and gain an understanding of their perspectives on the way in which the different cultures and identities have had an influence on the development of the program.. The data collection was structured to collect both qualitative and quantitative data.

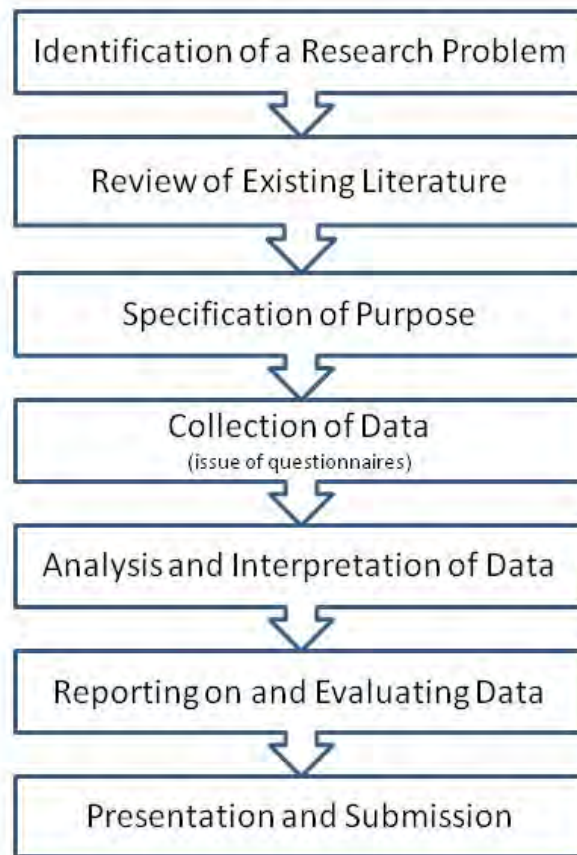


Figure 2. Research Plan - Based on Creswell (2008)

An extensive review of the existing literature was required to determine the status of knowledge within the field. This review of the literature initially focused on (a) The nature of disciplines and cultures, (b) The nature of interdisciplinary teaching and collaboration, and (c) Research, theory and methods associated with the study of education. This developed further as the literature was being interrogated and the review was broadened to address material across a broad area. (See Figure 1)

A biographical-narrative approach was taken in the design of the questionnaires. The objective was to gain an understanding of the different motivations and experiences of staff involved in the program. Recent work has shown that the life-stories of individuals are a valuable means of exploring both the complexity of their experiences of and that of the

particular cultures in which their lives are embedded (e.g., Chamberlayne et al., 2000, 2002). This approach aimed to explore a basis for discipline and culture within the personal motivations as well as the social interactions. The questionnaire therefore was developed in a ‘semi-structured’ format to facilitate in managing the data collection and subsequent evaluation.

The initial intention was to format the analysis and findings as a case study given its ability to establish cause and effect in real context. (Cohen et al., 2001, p181). However, while there remains an underlying educational case study emphasis, the research collects and uses quantitative data collection and analysis as a parallel methodology and process. The results and findings therefore will be presented in the form of a mixed methods study. This was motivated by the need to make comparative analysis between the disciplines around many of the emerging themes. The discipline specific perspective was determined through observations of the quantitative analysis.

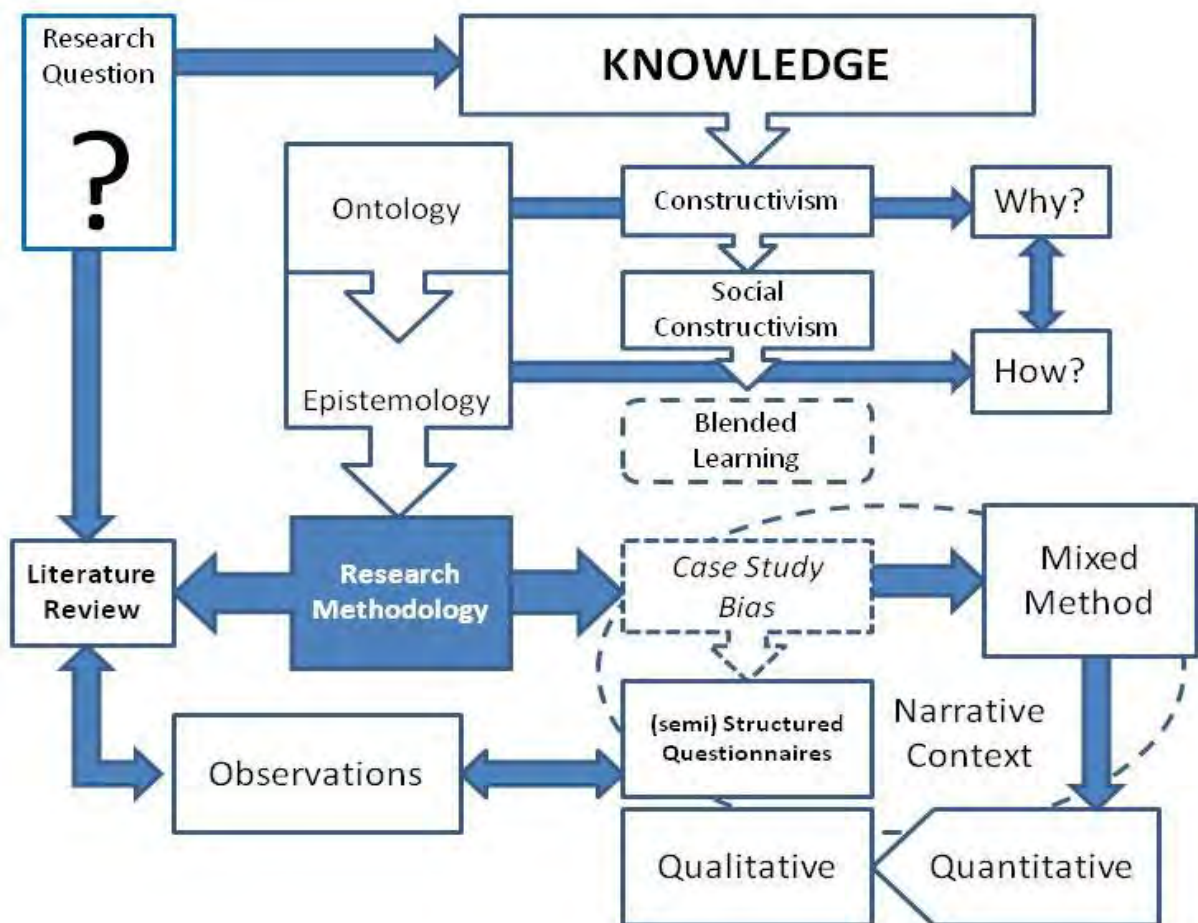


Figure 3. Research Framework



- 1) An interrogation of the literature pertaining to the research question with a view to ascertaining the current status of knowledge within the general domain. This interrogation was broad based and engaged with the literature across a broad range of areas

This interrogation of the literature was used to establish appropriate themes to structure further literature analysis as well as structuring a framework for the questionnaire design and data analysis framework.

- 2) While the initial intention was to undertake a case study involving the BSc in Product Design at the Dublin Institute of Technology, it became evident that the case study methodology alone would not be enough to extract a comprehensive analysis of the matrix of factors that influence the development and management of an educational intervention of this nature. The questionnaires were used to illicit a variety of qualitative and quantitative data which has been used in this study.
  - a) An interrogation of the original course documentation against the current course document subsequent to two reviews. (One for modularisation and one for a professional accreditation)
  - b) An interrogation of the external examiners reports from the four graduating years (2007 – 2010)
- 3) The development of two questionnaires to provide both qualitative and quantitative from those who have been involved in the design, management and delivery of the program.
  - a) A questionnaire survey of all staff of the program to determine their experience of the development and delivery of this particular program between 2003 and 2010.
  - b) A questionnaire survey of all management of the program to determine their experience of the development, delivery and management of this particular program between 2003 and 2010. This questionnaire was addressed to 3 heads of Department and 3 heads of School

## **Research Methodology – Questionnaire**

The initial intention was to use a questionnaire to interrogate staff teaching on the BSc in product design and also conduct interviews with management of the program in each of the three schools involved. However, given the role of the researcher as both developer of the initial program and a colleague of participants it was decided to use a questionnaire for both staff and management and avoid any possibility of interview bias.

A review of the literature in the field suggested themes and issues which informed the approach to the questionnaire design. The questions have been framed in a number of ways to illicit information in a variety of formats, involving a bipolar 5 point Likert scale, (strongly agree to strongly disagree), response particles, (*'yes' and 'no'*) with qualifiers and multiple choice

Some of the questions used in the study enable a correlation to occur between previous research in the field of 'disciplines'. The University of Salford conducted a questionnaire based study of academics in 2004 centred on inter and multi-disciplinary teaching and learning within a single institute.

The design of the general questionnaire encourages a mix of structured, semi-structured and unstructured questions. Given the size of the sample, it was appropriate to engage in a mix to provide both frequencies of response in certain areas as well as qualitative word based responses. (Cohen et al., 2000, p247). Dichotomous questions have been used to sort subsequent questions and illicit very specific content. Consideration has been given to the value of the answers sought in these instances to ensure relevancy. Multiple choice questions have also been used to gather information regarding a number of the topics.

Recognising that different respondents interpret the same words differently the 'anchor statements' (Cohen, 2000, p251) assist in providing degrees of discrimination in responses. Some open ended questions have been used in the general questionnaire and are the basis of the management questionnaire. These are used to illicit qualitative content rich responses. As Cohen (2000, p255) suggests it's the open ended responses that might well contain the 'gem' of information that might otherwise have been missed. The open ended question form the basis of the management questionnaire in order to catch "the authenticity, richness, depth of response, honesty & candour which are the hallmarks of qualitative data". (Cohen, 2000, p255).

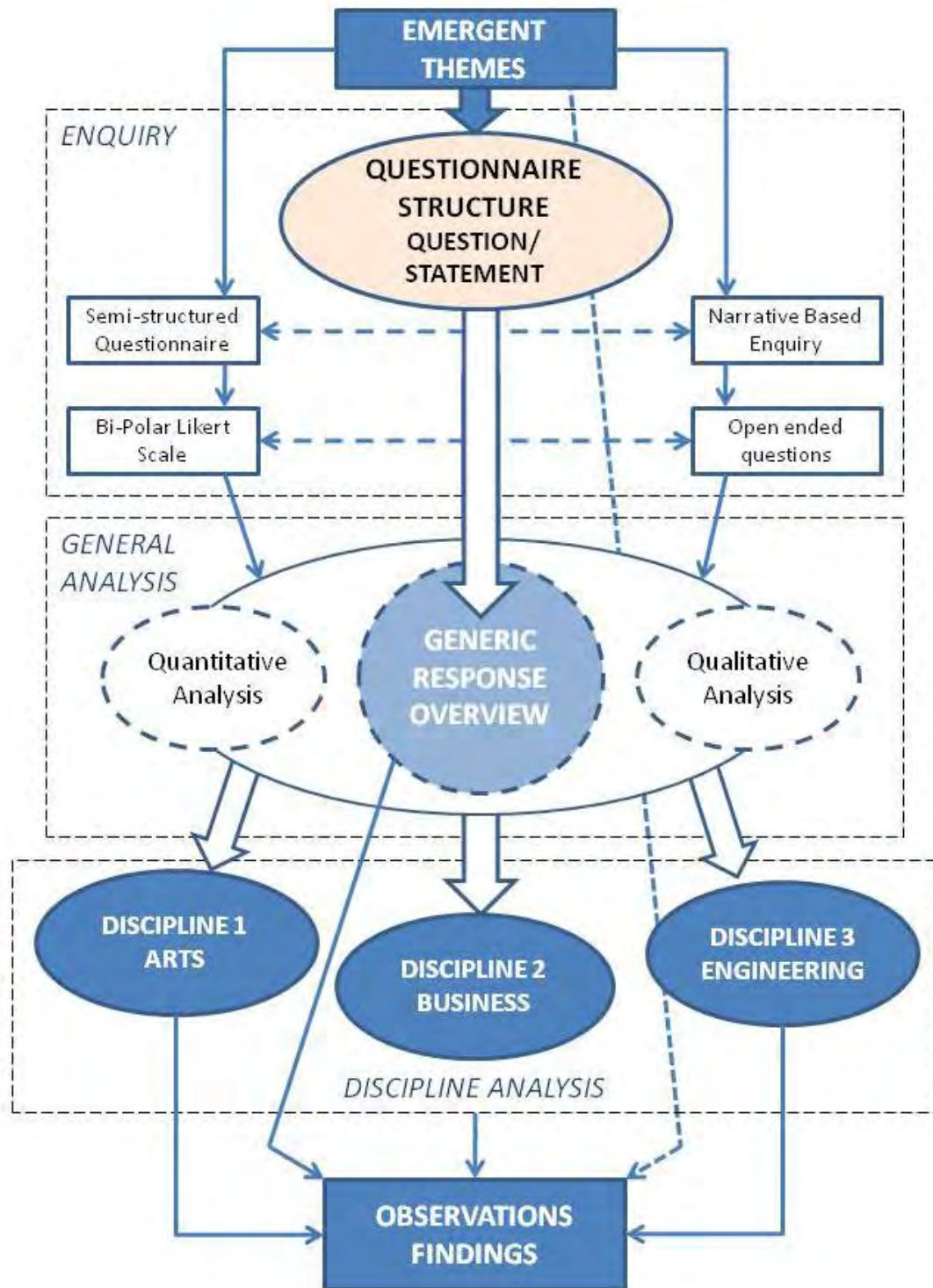


Figure 4. Research Questionnaire Structure

## CASE STUDY & MIXED METHODS

While the initial intention was to conduct an educational case study it became apparent in the process of the literature review that the nature and extent of the subject would require some degree of quantitative data collection and analysis to draw on statistical comparisons between discipline emphasis around the emergent themes. The subsequent design of the questionnaires (Figure 4) and data analysis methodology (Figure 5) was structured to collect rich narrative perspectives but to interrogate these against comparative discipline related data sets. These were then interrogated against the other data sets in the context of themes from the literature as illustrated in the Research Framework outlined in Figure 3.

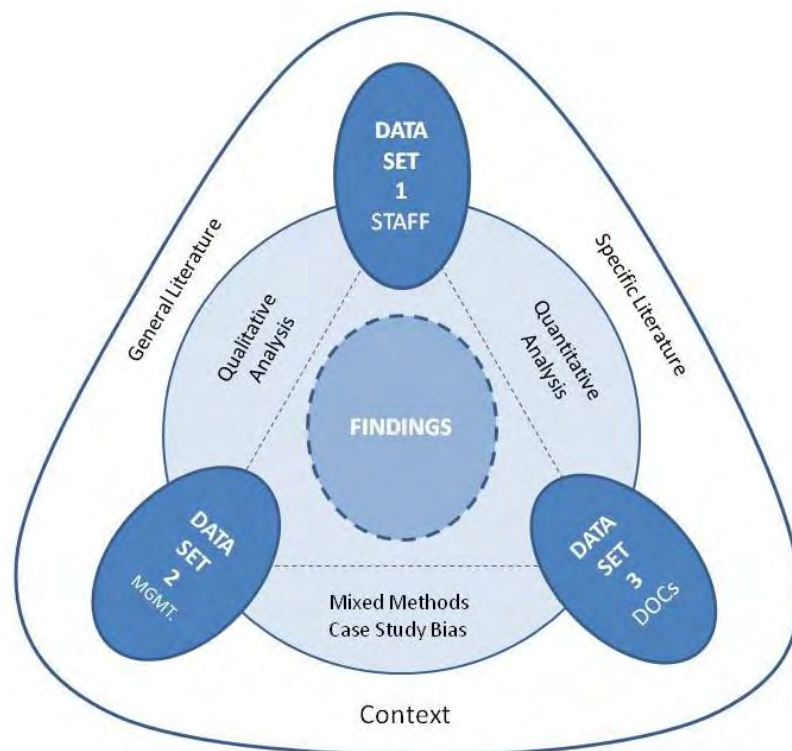


Figure 5. Research Structure Data Analysis

A consequence of undertaking this approach is that the data collection and analysis process have been more extensive than originally anticipated. A substantial body of data was collected but it has not been possible to analyse all of this data as fully as the author would like given the limitations of both time and reporting scale for this research. However, the data can be analysed beyond the specific context of this study to inform and direct further research in around the topic of discipline culture.

## DATA ANALYSIS

Data Analysis for this study consisted of an interrogation of material from a number of sources. The following outlines the sources used.

Source 1	Literature Review	<p>The literature review was used as a way to establish appropriate themes to apply to the overall research process. By interrogating a broad base of literature the intention was to consider the relevance of the emerging themes as universally as possible within higher education. While the study itself focuses on one particular intervention in the form of the BSc. in Product Design, it is appropriate to consider the broader implication of findings from this experience.</p> <p><b>METHOD EMPLOYED:</b></p> <p>Extensive literature review across a broad range of disciplines on a broad range of inter-related themes in order to determine common threads of relevant emergent themes.</p> <p>Breadth: Exploration across disciplines and subject material.</p> <p>Depth: Consideration around authors and themes that are core across these disciplines and subjects.</p>
Source 2	Course Documentation	<p>Examination of the Course documentation including materials prepared for validation, syllabi, modularisation, external examiners reports, and course committee meeting minutes.</p> <p><b>METHOD EMPLOYED:</b></p> <p>Coding of data for common themes.</p>
Source 3	Questionnaires	<p>Two questionnaires were prepared. One directed to the program management and the other directed towards program staff.</p> <p><b>METHD EMPLOYED:</b></p> <p>Coding of qualitative data as well as statistical analysis of relevant quantitative data.</p>

Table 1. Data Analysis Sources

### Questionnaire Analysis

Two questionnaires were issued as part of the data collection process. These were referenced as Research Questionnaire [a] which were directed towards Management and Research Questionnaire [b] which was directed to staff teaching on the program.

Research Questionnaire [a], data analysis consisted of a qualitative analysis of Section A, which consisted of 8 questions. A quantitative analysis of Section B and C, the data from which has been directly merged with the data from Research Questionnaire [b]. The qualitative analysis of Section A consisted of coding the feedback from respondents and determining the primary content.

Research Questionnaire [b] data analysis consisted of both a qualitative and quantitative analysis of 131 responses. The questionnaire provided a narrative question format to illicit rich data from respondents. Respondents were encouraged to provide reflective feedback throughout the questionnaire.

Questionnaire Reference Code: 210-16			
<b>Section 1 - Total Summary</b>			
Data:	Discipline Area	Teaching	Other
Number of respondents to category	9	12	2
Percentage responses to question	39%	52%	9%
Total Number of respondents	23		
<b>Section 2 - Arts Summary</b>			
Data:	Discipline Area	Teaching	Other
Number of respondents to category	3	4	0
Percentage responses to question	43%	57%	0%
Total Number of respondents	7		
<b>Section 3 - Business Summary</b>			
Data:	Discipline Area	Teaching	Other
Number of respondents to category	2	3	1
Percentage responses to question	33%	50%	17%
Total Number of respondents	6		
<b>Section 4 - Engineering Summary</b>			
Data:	Discipline Area	Teaching	Other
Number of respondents to category	4	5	1
Percentage responses to question	40%	50%	10%
Total Number of respondents	10		
Questionnaire Reference Code: 210-16			
Was the continuing professional developed focussed on discipline area, teaching or other?			
113-4			
<b>Observational Notes:</b>			
[210-16] 52% of respondents indicated that where they undertook continuing professional development it was focussed on teaching while 39% of respondents focussed on professional development linked to their discipline area. In the main the discipline breakdown was similar between the disciplines but with a slightly greater emphasis in Arts on both Discipline Area (43%) and Teaching (57%) than Engineering and Business who both indicated other areas of cpd in the mix. From the data set provided further investigation could be made of continuing professional focussed on both discipline or teaching, however, this is too detailed for the current research.			

Table 2. Data Analysis Sample for Research Questionnaire [b]

## Research Questionnaire: Response Rates

A list of staff who had taught over the duration of the program was produced and verified by each of the Heads of Department. A number of staff were identified as not being available at the initial stage and so were not included in the study. As already outlines two questionnaires were designed and circulated to all the staff and management of the program. Care was taken to guarantee anonymity of all participants. Table 3 and Figures 6 outline circulation statistics and response rates for these questionnaires.

<b>Research Questionnaire Circulation</b>			
	Management	Academic	Total
<b>Arts</b>	2	10	12
<b>Business</b>	2	15	17
<b>Engineering</b>	2	31	33
<b>Total</b>	<b>6</b>	<b>56</b>	<b>62</b>

<b>Research Questionnaire Responses</b>			
	Management	Academic	Total
<b>Arts</b>	2	8	10
<b>Business</b>	1	6	7
<b>Engineering</b>	2	9	11
<b>Total</b>	<b>5</b>	<b>23</b>	<b>28</b>

Table 3. Circulation and response to questionnaire

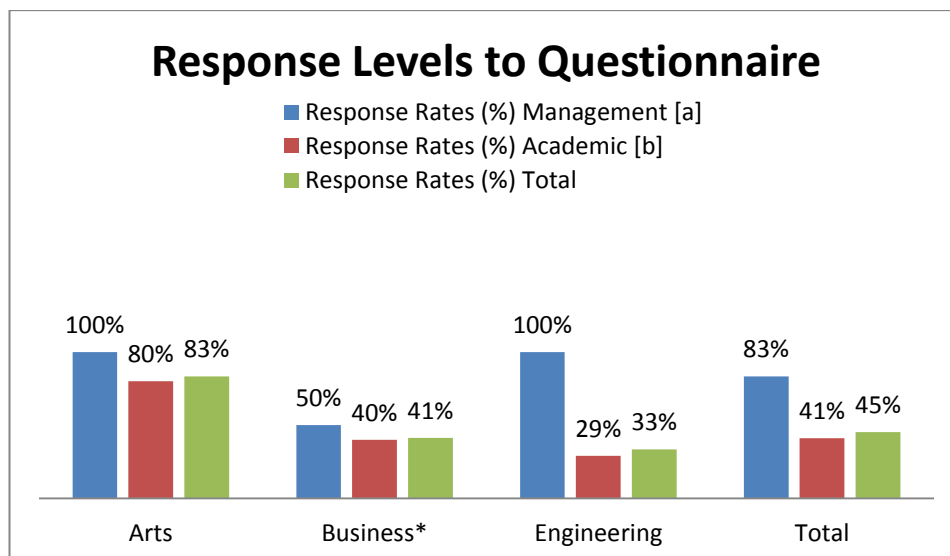


Figure 6. Response rates to questionnaire

Reference Coding for all Questionnaires sent to both Academic and Management Staff involved in the BSc. in Product Design.					
<i>The coding references the College within which the staff member is contracted. Management Codes are indicated in Bold. Responses are indicated by ticked boxes.</i>					
103A	Arts & Tourism	<input checked="" type="checkbox"/>	104E	Engineering	<input type="checkbox"/>
105A	Arts & Tourism	<input checked="" type="checkbox"/>	106E	Engineering	<input checked="" type="checkbox"/>
<b>111A</b>	<b>Arts &amp; Tourism</b>	<input checked="" type="checkbox"/>	107E	Engineering	<input type="checkbox"/>
114A	Arts & Tourism	<input type="checkbox"/>	110E	Engineering	<input checked="" type="checkbox"/>
<b>143A</b>	<b>Arts &amp; Tourism</b>	<input type="checkbox"/>	115E	Engineering	<input checked="" type="checkbox"/>
144A	Arts & Tourism	<input type="checkbox"/>	117E	Engineering	<input type="checkbox"/>
146A	Arts & Tourism	<input checked="" type="checkbox"/>	118E	Engineering	<input type="checkbox"/>
149A	Arts & Tourism	<input checked="" type="checkbox"/>	119E	Engineering	<input type="checkbox"/>
154A	Arts & Tourism	<input checked="" type="checkbox"/>	120E	Engineering	<input type="checkbox"/>
157A	Arts & Tourism	<input checked="" type="checkbox"/>	122E	Engineering	<input type="checkbox"/>
160A	Arts & Tourism	<input checked="" type="checkbox"/>	124E	Engineering	<input checked="" type="checkbox"/>
161A	Arts & Tourism	<input checked="" type="checkbox"/>	125E	Engineering	<input type="checkbox"/>
108B	Business	<input type="checkbox"/>	126E	Engineering	<input type="checkbox"/>
109B	Business	<input checked="" type="checkbox"/>	127E	Engineering	<input type="checkbox"/>
112B	Business	<input checked="" type="checkbox"/>	<b>128E</b>	<b>Engineering</b>	<input checked="" type="checkbox"/>
113B	Business	<input type="checkbox"/>	132E	Engineering	<input type="checkbox"/>
116B	Business	<input type="checkbox"/>	133E	Engineering	<input checked="" type="checkbox"/>
121B	Business	<input type="checkbox"/>	135E	Engineering	<input type="checkbox"/>
123B	Business	<input type="checkbox"/>	137E	Engineering	<input type="checkbox"/>
129B	Business	<input type="checkbox"/>	138E	Engineering	<input type="checkbox"/>
130B	Business	<input checked="" type="checkbox"/>	139E	Engineering	<input type="checkbox"/>
131B	Business	<input type="checkbox"/>	140E	Engineering	<input checked="" type="checkbox"/>
134B	Business	<input checked="" type="checkbox"/>	142E	Engineering	<input type="checkbox"/>
136B	Business	<input checked="" type="checkbox"/>	145E	Engineering	<input checked="" type="checkbox"/>
141B	Business	<input checked="" type="checkbox"/>	147E	Engineering	<input checked="" type="checkbox"/>
148B	Business	<input type="checkbox"/>	152E	Engineering	<input type="checkbox"/>
<b>150B</b>	<b>Business</b>	<input checked="" type="checkbox"/>	153E	Engineering	<input checked="" type="checkbox"/>
151B	Business	<input type="checkbox"/>	155E	Engineering	<input type="checkbox"/>
<b>158B</b>	<b>Business</b>	<input type="checkbox"/>	156E	Engineering	<input type="checkbox"/>
101E	Engineering	<input type="checkbox"/>	159E	Engineering	<input type="checkbox"/>
<b>102E</b>	<b>Engineering</b>	<input checked="" type="checkbox"/>	162E	Engineering	<input type="checkbox"/>

Table 4. Reference Coding for Questionnaires



## **TRIANGULATION**

According to Denzin (1978, p291), triangulation can be generally defined as "the combination of methodologies in the study of the same phenomenon." Olsen (2004, p.3) indicates that data triangulation can be considered as the mixing of data types to assist in validating claims or observations. Creswell (2008, p.266) outlines the use of triangulation as a means to validating qualitative data by means of drawing on multiple sources of information. This process can improve the quality of the results through convergence on the same phenomenon.

Figure 7 illustrate the data triangulation used to validate the research observations and findings of this study.

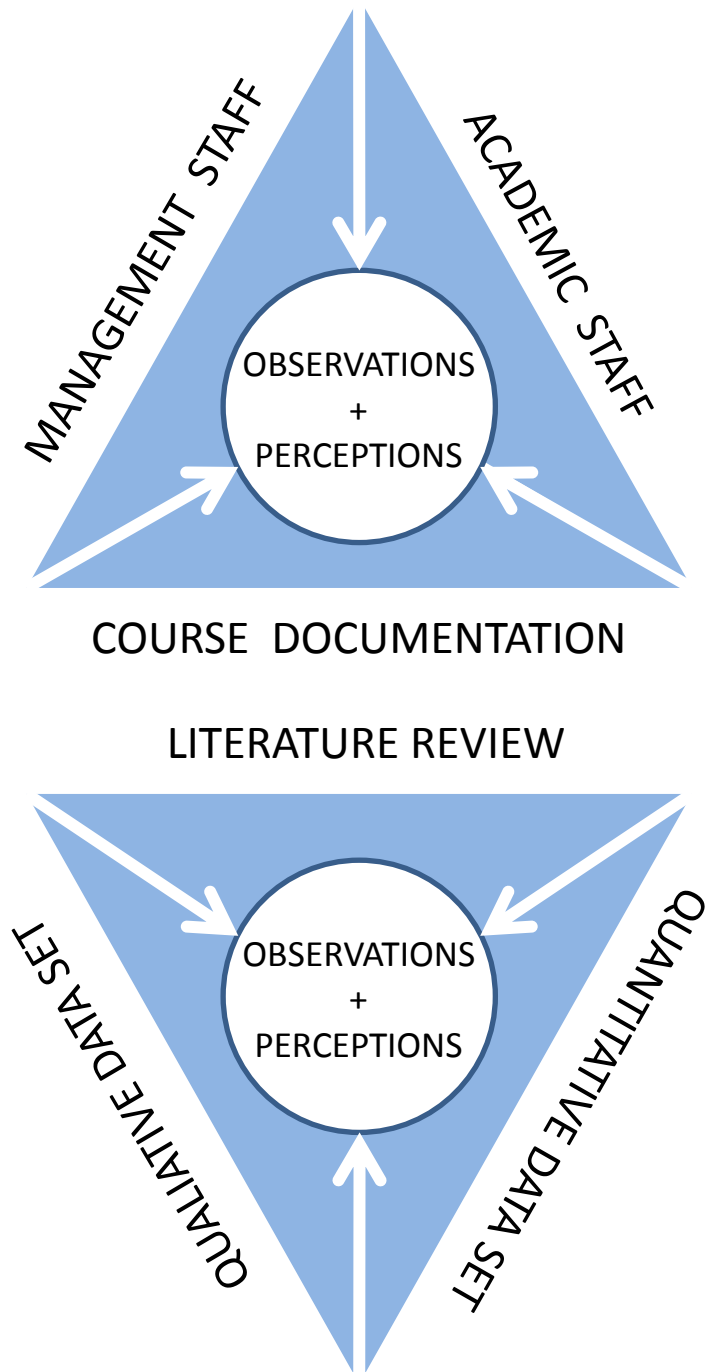


Figure 7. Outlines the structure of triangulation applied to the data.

## CHAPTER 4

### RESEARCH RESULTS

From the extensive literature interrogated as part of the literature review it quickly became apparent that many of the issues and concerns within disciplines in higher education are

experienced across disciplines. Over 200 different journals were included in this review and a number of concerns emerged which were relevant to the research agenda of this study.

## **DESIGN CONTEXT**

As the program is identified and described as an Honours Degree in Product Design, the relevance of design in the title should not be taken for granted. Design, by its very nature has a strong practice based context and communicating the qualities of that practice is an important aspect of an effective educational intervention. The issue of the title was broached on a number of occasions by external examiners. In her reports, Rahe, (2007, 2008) was concerned that the program as delivered did not reflect the title and that this was an issue that needed to be addressed. Concern was raised as to the amount and level of creative design that was evident on the program. However, the evidence from the research suggests that although almost half of the respondents teaching on the program have design qualifications [115-4], the majority of these are from the Arts area with a number of these staff also having engineering qualifications; [113-4].

This evidence would suggest that the expressed concerns over the level of creative input were not as a result of capacity or capability but more likely linked to integration issues. A number of staff on the program also had dual qualifications, i.e. engineering degrees in Arts, and design degrees in Engineering, and while the numbers are not particularly high it does reflect recognition of the value associated with the combination of these two disciplines; [115-4, 116-4]. This is supported strongly in both the course documentation and the management narratives. This would also indicate a transition from the multi-discipline to inter-discipline and consequently the integration necessary to fuel creativity and innovation are beginning to yield dividends. (See Figure 10)

## **IDENTITY**

*The importance of identity in this research has its significance in perception regarding both discipline and institutional cultures. The 'en-culturalisation' of professionals into the world of academia has an extensive literature associated with it. [This is a valid study in its own right and could be recommended for future research investigation]*

On issues of professional identity, there are clear differences between some of the disciplines. Both Arts and Business respondents had high membership of professional bodies. However, both these disciplines also had a high percentage of staff associating their professional identity with teaching; [104-2]. Engineering staff however, strongly associate their professional identity with teaching but have a much lower level of membership of professional bodies; [104-2; 106-2]. In Arts, there is a strong association between teaching and practice and so working between both is natural and instinctive. In Business, professional membership carries a professional status and in many cases can have association with professional development and be a source of important industry discourse which is relevant to the academic role. In Engineering however, professional bodies tend to have an emphasis on practice based validation, in terms of standards, ethics, insurance, indemnity, etc., and as such do not have direct relevance to educational practice. Most Engineering respondents appeared to see themselves as teaching professionals as distinct from engineering professionals and very few indicated that they were engaged in consultancy activities; [108-2]. On the other hand Arts respondents were heavily involved in consultancy activity which is linked to the natural integration of teaching and practice that is associated with the general discipline; [108-2].

There was little discipline difference with regard to research activities, with a large number of respondents across all discipline areas indicating that they were involved in some form of research; [107-2]. While none of the differences expressed are profound in their impact on the academic process, they do indicate very different positions with regard to professional identity as it manifests itself in disciplinary contexts.

Most respondents expressed concern over the separate campus locations suggesting that this was not a positive experience for the students; [153-8]. This is emphasised by a strong narrative across all the disciplines and from both teaching and management staff. However, an apparent contradiction to this position emerged when almost half the respondents indicated that the separate campus locations facilitate the students in experiencing the diversity of disciplines; [155-8]. There were considerable discipline differences on this point with most Engineering respondents positively disposed to this assertion while just over one-third of Arts staff felt the same way. Consideration must be given to the nature of the physical locations and the way in which the disciplines support students at the different locations. This differs considerably between the various sites and could influence the staff perspective. However,

the narrative also outlines the benefit that would accrue from the integration of the various colleges on a single campus, (i.e. Grangegorman).

Almost two thirds of respondents associate their academic discipline with an external professional discipline. In discipline terms Arts respondents indicated the strongest association with the external professional discipline while Business has the weakest association. This data can be interpreted as a reflection of a strong teaching/professional bias that occurs within Higher Education Arts education in general. This aspect of Arts education (in this case specifically linked to Design), is recognised within the literature on academic and professional identities and constitutes a significant consideration in the nature of pedagogic practice within design. [167-10]

Approximately two thirds of respondents indicated that there is a clear perception of their discipline externally. When considered within a discipline context however, substantial differences emerge. 88% of Engineering respondents indicate that there is a clear perception of their discipline externally, with two thirds of Business respondents acknowledging a similar perception. However, only 38% of Arts respondents acknowledge that there is a clear understanding of their discipline externally which once again highlights the ambiguity that exists within the Arts and discipline discourse. This data set can be interpreted as constituting a strong discipline confidence within both Engineering and Business reflecting the established boundaries that exist around these disciplines in Higher Education. [168-10]. This difference in discipline context emerges under subject specialism's also. Interrogating the data as a whole would allow an interpretation that suggests that the interdisciplinary nature of the program concept is impacting on the subject specialism more than on the discipline context and that crossing boundaries has an effect on clarity around some of the subjects; [169-10]. However, almost three quarters of respondents indicated that the boundaries of their subject specialism are flexible. Given previous figures it is no surprise that most of Arts staff acknowledge this boundary flexibility. However, approximately two thirds of Engineering and Business respondents indicate that the boundaries of their subject specialisms are also flexible.

Discipline differences arise in relation to how respondent's perception of their discipline identity was formed. While almost two thirds of the overall respondents acknowledged that their personal experience of higher education informed their view of discipline identity, this was mainly among Business and Arts respondents, with just over one third of Engineering

respondents associating their discipline identity with their experience of Higher Education; [154-8].

### **DISCIPLINE (Crossing disciplines)**

One aspect of a cross-disciplinary program is to develop synergies between the various disciplines in a way that adds value to the overall program. However, less than half of respondents to the questionnaire felt that the synergies between the schools were natural and appropriate for the delivery of the program; [131-6], suggesting the need to develop the discourse across the disciplines. Less than 10% of the total respondents felt that the contact between the different disciplines is adequate; [134-6]. The narrative of both management and teaching staff highlights this particular issue and provides some insights into why that may be the case. A number of aspects emerge in this discourse which suggest that staff in different disciplines have a limited knowledge of what their colleagues do in terms of teaching methods, [135-6] and assessment methods, [136-6]. A body of literature referenced in this study does recognise the differences that exist in teaching methods etc between disciplines, however, awareness of the different methods engaged by others on a single program could be an important part of understanding the overall ethos and being able to communicate that to the students. There are also implications for collaboration as an effective collaboration on content related aspects of the programme will inevitably require a negotiation around teaching and assessment methods.

### **Experience of crossing boundaries (department, school and discipline)**

Approximately two-thirds of the staff involved on the programme teach outside their own school. The spread is not substantially different across the disciplines; [121-5]. This would suggest that a substantial number of the programme staff are involved across schools. However, data analysed would also suggest that while they may work across departments and schools most of this work is primarily focussed within their disciplines; [120-5, 122-5]

### **INTER-DISCIPLINE**

The vast majority of respondents are positively disposed to the inter-disciplinary nature of the program and indicated that an interdisciplinary approach contributes to the growth of knowledge; [179-11]. Only a small number of respondents had concern over the breadth of engagement having any negative effect on disciplinary rigour, [177-11; 178-11; 180-11].

However, less than half of the overall respondents indicated that discipline specialisation would be best placed at post graduate level in order to provide an interdisciplinary base to a student's overall study. There were definite discipline differences on this subject with most Arts respondents of this viewpoint. Less than half of Engineering and no Business respondents were in agreement with this suggestion. In terms of the discipline polarisation indicated by the data, the nature of the work undertaken within Arts, would be more interdisciplinary in nature, with a natural tendency to specialise within a discipline at post graduate level. While this is essentially the same baseline for Business and Engineering the reality is that they both tend towards a more discipline orientation in undergraduate than does Arts. The data bears out the difference. [185-12]

The data suggests that while respondents don't see Interdisciplinary studies at undergraduate level weakening the knowledge base of established disciplines there is still an underlying concern about how they will impact on the discipline context; [183-11]. This is emphasised when we consider that just under half of the respondents agreed with the contention that students must first reach a deep understanding and knowledge of disciplines before they can tackle study across disciplines. The discipline emphasis suggested here was supported more rigorously by Engineering respondents than either Arts or Business. [186-12].

All of Arts the respondents suggesting a preference to teach across discipline boundaries. However, a number of respondents from both Business and Engineering indicated a preference to teach within the boundaries of a single discipline. Once again the stronger discipline orientation encourages staff to remain within that discipline domain. [187-12]. The same type of responses were gathered when questioned about research emphasis, once again showing a stronger discipline orientation among both Business and Engineering respondents; [188-12].

Over half of the respondents indicated that the nature of their teaching has changed as a consequence of their involvement in the BSc in Product Design. While the research does not interrogate exactly why they perceive changes to have occurred, it is not unreasonable for us to infer that this is a positive aspect of the program. The substantial quality of the program is its interdisciplinary, cross faculty nature and that this is effecting change on the way staff perceive their teaching. There are also disciplinary differences which are worth taking account of. Over three quarters of Engineering respondents indicated that the nature of their teaching had changed, while half of Arts respondents had a similar experience. [208-16]

## **DISCIPLINE EMPHASIS**

When exploring the perception around discipline emphasis on the program a number of interesting perceptions emerged. It is important to note that the data collected did not seek to place a value rating on discipline emphasis, but simply to determine what individual and discipline perspectives are in relation to the emphasis of different disciplines. While over two-thirds of respondents indicated that they feel the major emphasis on the BSc in Product design is on Engineering, the discipline differences were considerable. All of the Arts respondents indicated Engineering to be the major emphasis while only half of Engineering and Business respondents were of the same view. [199-14]. One third expressed that they felt that the major emphasis on the BSc in Product design is on Design. Discipline differences emerge around the question of major emphasis, [200-14], these differences amount to a sense of confusion around the question and as such links to the questions which arise in a number of external examiners reports regarding the program title. These perceptions of emphasis may also be heavily influenced by the discipline vocabularies that prevail within discipline. Design has very specific meaning within different disciplines and inevitably the perceptions will be expressed through that discipline lens. It is worth noting that no respondents indicated that the major emphasis on the BSc in Product design is on Business. [201-14].

## **CULTURES**

This research indicates that a substantial majority of respondents consider disciplines, [138-7]; departments, [139-7] and schools, [140-7]; within higher education institutes, to have distinct cultures. It should be noted that while only slight variances emerge between staff perceptions of culture within discipline, department and schools, there are differences that could warrant further investigation. These could be influenced by particular discipline, department, school or institute circumstances that do not have general application or they could be trends worth considering.

The data from almost two thirds of the respondents indicated co-operation between disciplines is affected by the nature of the disciplinary cultures. This position would support a view argued within some of the literature that cooperation is most usual within disciplines and less frequent between disciplines. [141-7]

Half of the respondents indicate that they believed students are aware of the differences between the discipline cultures on the program; [159-9]. In practical terms this is little more



than a perception of where students are at in relation to this issue, as students have not been canvassed as part of this study. However, these perceptions are important in terms of the messages that staff communicate to students regarding the overall programme.

### **Discipline Culture**

Just over one third of respondents indicated it is important for students in Higher Education to identify with a particular culture. A possible inference to extract from this is that the mix of discipline cultures on the BSc. In Product Design is perceived as a positive experience and the identification with a particular culture on this type of program is not particularly important. [156-8]

While the majority of respondents in both Engineering and Business regarded their discipline as being well defined only one quarter of Arts respondents felt this was the case for them. [165-9], however, when questioned about the need to protect and defend their discipline; the majority of Arts respondents did not feel the need to do so. However, one third of Business respondents felt the need to protect and defend their discipline with over half of Engineering similarly positioned; [166-10]. This data in many respects correlates with the inherent multi-disciplinary orientation of Arts and indicates a polarisation between Arts & Engineering around the subject of defending and protecting the existing discipline reflecting the strong disciplinary tradition in Engineering and the broad interdisciplinary nature of design.

### **Discipline differences in teaching and learning**

Over half of the respondents indicated that their discipline uses very different teaching and assessment methods to the other disciplines on the BSc in Product Design. When we analyse the data from a discipline perspective we can see a substantial difference between the Arts, where the majority of respondents acknowledge the difference, and the other two discipline areas. This difference in perspective around teaching and assessment methods corresponds with the literature on discipline differences where the 'soft' nature of Arts content contrasts with the 'hard' nature of Engineering content. [175-10]

However, almost all respondents also acknowledge that it is important for staff delivering on a program like the BSc in Product design to be aware of the teaching and assessment methods used by other disciplines; [158-8]. Most of the respondents teaching across the disciplines

acknowledge that there are considerable differences in how arts, engineering and business address the teaching and assessment of academic content; [157-8]. They also acknowledge that these differences between the ways of teaching and assessing across disciplines need to be upheld; [162-9; 163-9] and that a mix of teaching and assessment methods enhances the breadth of the program; [164-9] and are seen as a positive element of the program structure; [176-10]

The data suggests that in over half of the responses made the respondents did not feel that their discipline area had a clear approach to how it should be taught and assessed. Discipline differences emerge on this subject as this view was mainly expressed by Arts and Business. Engineering respondents were generally of the view that their discipline area had a clear approach to how it should be taught. Here the philosophical differences between arts and science emerge; [172-10; 173-10].

A majority of respondents from all three disciplines areas indicated that in their view working across discipline boundaries improves teaching practice. This high approval rating contributes to a positive disposition towards the interdisciplinary approach used on the BSc. in Product Design. [180-11]

### **Discipline Knowledge**

Very few respondents regarded discipline knowledge as the most legitimate form of knowledge. In taking a discipline based perspective the more rigid the discipline the higher the perception of legitimacy. [171-10]

### **MANAGEMENT OF THE PROGRAM**

Management of the program centres on the Bolton Street campus and falls within the remit of the School of Manufacturing and Design Engineering. While in principal there is a shared responsibility for the management of the program the majority of the day to day activities are directly managed from this School. Of the total respondents teaching on the program almost one third are involved in some way with the management of the program. This involves activities such as year co-ordinators and course chairperson. However, none of the teaching staff involved from Business are involved in any aspect of the course management; [118-5]. The role or perception of role of Business staff on the program is raised on a number of occasions in the research investigation. As indicated there are no staff involved in the

management of the program, (though it is important to acknowledge that the Head of Department from Business is involved and committed at a senior management level), neither are any of the teaching staff from business dedicated to the program delivery; [119-5].

Almost 40% of staff who responded to the questionnaire considered the management style in the organisation to be characterised by teamwork, consensus and participation; [137-6]. While there were some differences between the discipline areas these did not suggest any particular discipline orientation or bias. Interpreting the results is difficult in terms of a definitive argument, however, the ongoing evolution, (both real and perceptual), from a collegial to a managerial culture of management could account for the general figures.

## **COLLABORATION**

Arts respondents are the most active of the three discipline areas in terms of collaboration with colleagues from other schools or departments; [123-5]. However, only a small number of Business respondents indicated undertaking any collaborative activity at all. However, it was clear though that all who had undertaken collaborative work, irrespective of discipline orientation, were very positive about its benefit; [124-5]. Half of the respondents were in agreement that the BSc. in Product Design is in itself conducive to collaborative activity. However, this was not even across the discipline areas, as Arts respondents were generally unconvinced that the program was conducive to collaboration. Most Engineering respondents did feel it was conducive to collaboration, but most Business respondents were uncertain; [125-5]. Perhaps we see differences emerge here in terms of the discipline expectation of collaboration. Arts related disciplines have a tendency to engage in an extensive amount of collaborative work both academically and professionally. This is less evident in Engineering disciplines where the emphasis is placed more dynamically on the distinct knowledge base and its application academically or professionally. There is also the traditional difference between an 'Arts' degree and a 'Science' degree, which influence perceptions of the way the likes of collaboration is contextualised.

However it was acknowledged in both the original validation panel responses as well as from the subsequent IED validation that the disciplines appeared to collaborate at particular levels which are evidenced in the existence of the program itself. However from the early external examiners reports there were question marks drawn over the practical degree of collaboration occurring at a delivery level on the program.

While many of the respondents felt that collaboration was already a positive characteristic of the programme; [126-6], most recognised that increased contact between the disciplines would contribute to improving collaboration on the programme; [127-6, 149-8]. Contact between staff can manifest itself in a variety of ways from informal to formal, however, the 'relationship' elements of 'collaboration' arise as a relevant contextual issue and are expressed here in the most positive terms. Most respondents indicated that there should be more collaboration between discipline areas as a means to creating new synergies; [143-7]. Almost all staff felt that collaboration offers new opportunity to develop the program; [145-7, 147-8]. There is a substantial literature that argues the benefit of collaboration. It is clear that staff acknowledge the benefits of collaboration.

When asked to consider students understanding of the rationale behind the collaboration on the BSc. in Product Design, three-quarters indicated they felt students understood the rationale; [128-6]. This is a question of both perception and teacher position. In fact without surveying students we do not have an exact picture of what their position or understanding is. However, the perception of staff is important in so far as the staff perception of student positionality could influence the classroom, studio or lab relativism regarding the whole programme. Seeing your subject or discipline, in the context of other subjects, and how they might be understood by students is an important 'integrative' concept. However, this data points to the fact that one-quarter of respondents did not believe that students understood the rationale behind collaboration. This gives rise to a concern, in so far as 'collaboration between the Arts, Business and Engineering' is a central tenet of the entire program structure, suggesting there is a deficit arising in how this rationale is being effectively communicated.

This is emphasised even more when there is also an expressed lack of certainty in up to one quarter of the staff regarding their understanding of the rationale behind this 'collaboration';[129-6]. Committing to and communicating integrative values needs to be a comprehensive concept at the teaching level. This correlates with a degree of stated negativity expressed by some respondents regarding the relevance of collaboration in some areas. However, it is also important to appreciate that collaboration may not be relevant in all areas or at all times and therefore not all respondents would see 'collaboration' as appropriate to their subject. What is essential however is that the importance of the 'collaborative' aspect of this educational intervention is understood and valued.

Prevailing institutional structures were seen by almost two-thirds of respondents as a barrier to collaboration on the BSc in Product design; [144-7], with all Business respondents taking this position. This reflects a number of points that arise within the narrative that indicates limitations currently existing around geography. The Business narrative is particularly strong around this issue.

All of the Arts and Engineering respondents and the majority of Business respondents indicated their disciplines could accommodate different ways of teaching and assessment. This is an important position to take in the context of collaboration, as a failure for disciplines to be able to accommodate different ways of teaching and assessment could limit the potential to develop real collaboration. [174-10]

So while responses from staff clearly acknowledged the need for collaboration on the program, the way the collaboration is structured is important for how it might well be perceived by staff; [160-8].

## **PROGRAM STRUCTURE**

While less than half of respondents felt the current structure of the BSc. in Product Design was appropriate, there were discipline differences evident from the data. Most Engineering respondents were comfortable with the current structure, however, neither Arts nor Business were quite so positive. Business respondents were particularly uncertain; [130-6], with the data suggesting a lack of engagement in the 'overall' picture, a reflection upheld by a number of Business staff narratives.

A similar discipline divergence emerges from the data in terms of respondents understanding of the relationship between the various modules on the program; [132-6], with no Business respondents claiming to understand the relationships between the modules at all. However, in contrast, the majority of Engineering respondents claim to understand the module relationships but only half of Arts were clear on this relationship. These discipline differences highlight aspects of the program and its structure that need to be addressed. It appears that for two out of the three collaborating faculties, there remains a high degree of uncertainty around aspects of the program that should be clearly understood. This is further emphasised with less than 20% of Arts respondents indicating that they believe the current balance of subjects is appropriate to the development of a product designer; [133-6].

When interrogated about the various levels of discipline orientated content on the program, most respondents felt the Engineering level to be appropriate; [150-8]. However almost half the respondents indicated that they felt there should be more focus on the creative design content; [151-8]. Only one third of Engineering respondents felt that there is adequate creative design content currently on the program and none of the Arts respondents felt there was an adequate input of creative design. This represents considerable discipline variance which has been thrown up around the area of creative design. This appears to be a contentious issue in that its balance defines the program emphasis, ethos or 'culture'. With regard to Business, almost 40% of the total respondents felt there should be more focus on this area; [152-8]. The discipline breakdown is interesting in so far as 56% of Engineering respondents feel the need for more focus on Business, while only 17% of Business respondents feel the same. The narrative from Business respondents would support the data outlined here in so far as they see themselves as service teaching and the subsequent lack of ownership results in a lack of commitment in terms of additional focus on their discipline area. An alternative viewpoint is that they feel the level of input is appropriate, however, the 67% uncertainty figure would indicate this unlikely to be the case.

### **Course Materials/Structure**

Almost a quarter of the staff teaching on the BSc. in Product Design, indicated they had not read the course document; [189-13; 190-13], but almost all indicated that they deliver the syllabus in accordance with the outline in the course document; [193-13]. However, practically all of the respondents indicated that it is either important or very important to have an overall picture of the module structure for the BSc in Product Design. [194-13] yet less than half indicated that they were clear on the role of all the various modules that constitute the program; [191-13]. While we can assume that respondents are clear on the role of their own modules this data would suggest that many do not have a cross-program perspective. To engender a truly collaborative program it is not only important that staff are comfortable with their own module role, but also to understand it in the context of the entire program.

While most respondents indicated that they were familiar with the course structure of the BSc in Product Design, we observe some variances among disciplines which are significant. While all of the Engineering respondents indicated they were familiar with the course structure, less than one third of Business respondents claimed to be familiar. This reflects the

narrative conception expressed by a number of Business respondents that their role was as "service teaching" and that they did not feel a part of the BSc in Product Design; [192-13].

### **Curriculum Development**

Only half of the overall respondents indicated they made have contributed to the development of the curriculum for the BSc. in product design, with the majority of the contributors coming from Engineering. While this can be linked to a number of reasons, including staff turnover, one interpretation of this data might suggest that the "ownership" element of the program might in some way contribute to the lack of contribution to the curriculum development. The day to day discussions that can occur within the physical location of Engineering where most of the staff delivering are located will engage staff in a much greater sense of ownership than on the Business and Arts sites where both students and staff are only engaged on a partial or peripheral basis. While this interpretation is mainly a speculative consideration of the data it does cross reference to some of the narrative concerns expressed by both staff and management located on these separate sites. [195-14]

The data suggests that respondents' perceptions are that the current curriculum is not facilitating the type of collaboration that would integrate the disciplines in a more comprehensive manner. Already we have ascertained earlier in the research that this type of collaboration would be a very positive occurrence, suggesting that this is an area of the program that may need further investigation. [196-14]

The data also suggests that there is a perception among respondents that students are not able to identify with the way discipline integration is manifest on the program is significant. Understanding the disciplines and how they relate to each other is an important part of the development of their understanding of who they are and how they will fit professionally. This data suggests this is an area that could benefit from further investigation. Interdisciplinary success will in some part be dependent on disciplinary understanding. [197-14]

The majority of respondents felt that there should be more opportunities to discuss and develop the curriculum for the BSc in Product Design. [198-14]

Only a small number of respondents indicated that they feel the balance between disciplines on the BSc in product design is right at present. [202-14]

Just over half of the overall respondents indicated that real world issues and problems should be the focus of educational activity. However discipline differences arise with regard to this issue. While most Business respondents felt that real world issues and problems should be the educational focus less than half of the Arts and Engineering respondents were of that view; [181-11]. Certainly from the creativity perspective a certain amount of work needs to be conceptual to enable a creative toolset to develop while in engineering the discipline emphasis would be on a certain amount of theory building in advance of real world scenarios.

Very few respondents agreed that the advance of specialisation has rendered many disciplines too complex for undergraduate study. However this position is in conflict with some of the literature on this subject. [184-12].

### **Strengths and Weaknesses - Barriers to the development of the program**

The location of the program across different sites was seen as a barrier, (134B) resulting in limited contact between staff, (134B). The different philosophies that exist between faculties/colleges were also cited as a barrier, (134B). Another barrier was seen as the amount of time available to individual lecturers, who were outside the core program to engage in its development, (112B). Institute policy and leadership were also cited as barriers (112B); [203-15].

The involvement of the Business College should be strengthened on the program, (112B), and more collaborative work should be undertaken across the colleges, (112B). More inputs should be provided to prepare students for job hunting when they exit. (112B); [204-15]

The major strengths of the program were seen to include the core of dedicated lecturers and management, (112B), as well as having students who are, in the main, bright and engaged in the subject, (112B;134B). Other strengths of the program are seen as the relatively small class size, (134B), and the mix of subjects, (134B); [205-15]

The data on experience and age profile suggest a healthy mix of young and experienced teaching staff across the entire program. [206-16, 207-16]

### **Teaching and Learning**

Over two-thirds of respondents have undertaken some form of continuing professional development over the past 5 years. There is little variance between the disciplines regarding



this issue and is likely to reflect a growing emphasis being placed on professional development by the institute. [209-16]. Over half of those who have undertaken some form of continuing professional development focussed on professional development in relation to their teaching with over one third of respondents focussed on professional development linked to their discipline area; [210-16, 211-16].

Of those who undertook continuing professional development most claimed it had contributed to the development of their professional identity as an academic; [212-16]. However, of those who have not engaged in any form of continuing professional development 40% recognise it would make a contribution to their development of professional identity as an academic. [213-16]

## **FINDINGS - SUMMARY OF ANALYSIS**

The following results have been distilled from the objective research analysis undertaken in response to the research questions posed at the outset of this study.

### **Geographical Proximity (Communication)**

The location of the three different schools on geographically different sites in Dublin City has been presented as a beneficial quality of the program on the basis that students could experience different colleges and disciplines across the institute. However, there is no evidence to support this assumption in any of the course documentation or within the research findings. On the contrary, product design students have continuously sought more physical resources in Bolton Street in order to have a stronger sense of location for the program. However, while there has been a discourse around the positive and negative impact on the inherited geographical locations there has been no discourse on the impact that the separate locations might have on the academic staff involved in the delivery of the program. The research indicates a strong critical narrative around the fact that the program is located across a number of sites. Not surprisingly the strongest criticism emerges from staff in both Arts and Business as the perception emerges that these Schools provide a type of service teaching to the Engineering School.

In practical terms the location of the program across the different sites enables a reasonable level of multi-disciplinary delivery of the program. However, it limits the development of inter-disciplinary delivery and effectively excludes the possibility of evolution towards trans-disciplinary.

This critical voice regarding the tri-location of the program underpins the need for a particular type of socialisation in order to facilitate the educational objectives of the BSc. in Product Design. The structuring and resourcing of an effective cross-discipline educational intervention requires an institutional commitment to enabling both formal and informal relationships to develop. While these relationships can begin to emerge in time, as in the case of this particular program, it is clear that more can be done to facilitate them in a structured manner leaving less to chance. However, it also requires a commitment from staff across the disciplines and across the different stages of a program to engage in a shared discourse about the educational journey they've embarked on. The research analysis would suggest that most

staff are happy to engage in cross-disciplinary discourse and activities given the opportunity and recognise the benefits that accrues from cross-disciplinarity.

It is also clear that while most academic staff engaged on the BSc. in Product Design have strong allegiance to the ‘discipline’, they are not confined by it. Discipline boundaries are less of a challenge to cross than the physical boundaries of different locations. The lack of both formal and informal discussion are more limiting for most staff and can lead to a sense of separation and on occasion isolation. Different physical locations as manifest in the case of the BSc. in Product Design reduce the opportunity for strong, effective and dynamic relationships from forming. This type of socialisation enables ownership of the particular program and engenders a sense of pride in its particular educational actions, ambitions and achievements. This in turn contributes in a positive way to the academics own identity as well as establishing and re-enforcing a group identity. Failure to develop this aspect of a cross-discipline, cross-college educational intervention can result in academics withdrawing to the comfort of traditional discipline, department or school boundaries.

The research findings suggest that where adequate socialisation has not occurred on the program there is a resulting sense of ‘out sidedness’ or ‘disenfranchisement’ evident in the narrative. This is most strongly evident within a particularly polarised narrative from Business staff and with Arts staff to a lesser degree. However, the research analysis highlights the substantial improvements in socialisation between Engineering and Arts which have resulted from stronger informal and formal relationships across the disciplines. Where this socialisation has been successful the educational benefits have been substantial and this is particularly recognised in the reports from external examiners.

### **Cross-disciplinary evolution**

In cross-disciplinary educational interventions like the BSc. in Product Design there is arguably an inevitable evolutionary process which results in changes and improvements over a period of time. In practical terms a strong educational intervention should evolve and change to meet the challenges of developing knowledge, practice and societal demands. However, the most effective way to enhance the process of change and development as a program evolves is to ensure that there is recognition of the critical elements that augment and focus this evolution. Staff, technical, and space resources are essential ingredients, but as experienced on the BSc. in Product Design, not always enough to meet the potential or

ambitions of the program. Structuring the curriculum and engaging the staff in appropriate discourses that occur in a variety of ways can enhance the evolutionary nature of this type of educational intervention.

The transition through multi-disciplinary, inter-disciplinary and trans-disciplinary stages is demonstrated in the attached diagrams. A question still arises as to whether this represents a necessary evolution to a trans-disciplinary program (and consequently being on the threshold of a new discipline discourse), or whether the stages are discrete educational reference points. What is clear is that each stage requires an increasingly complex negotiation to be undertaken in order to evolve. This in itself is a subject that needs further investigation in order to determine the specific conditions that need to be defined to best enable the transition.

The BSc. in Product Design clearly has ambitions to evolve into a trans-disciplinary program. However this program is still at an early stage of an interdisciplinary discourse having begun to emerge from a multi-disciplinary default position. To make the next transition will require a continued, sustained and increasingly rich socialisation process and cross-disciplinary discourse to develop. Whether the institutional structures are there to support this level of integration and collaboration remain to be seen. The evidence would suggest that there is awareness among many academic staff and management of what is achievable but there are still some who are constrained by their traditional 'bounded' experiences. Perhaps the greatest challenge to making these transitions in the near future is the physical barriers of three different sites inherited by the program.

### **Culture of Disciplines**

Much of the research data analysed as part of this study supports the contention that disciplines have different cultures. While the data set analysed was not substantial and would not support generalisation, it does in many cases concur with findings from across the multiple literatures interrogated. It is clear, therefore, that disciplines are a significant conveyor of culture within both academic and professional contexts and display distinctive characteristics which construct the nature of their disciplines identity. As the primary elements of academic and indeed professional culture, disciplines need to be acknowledged and facilitated in their role of knowledge construction and knowledge guardianship.

However, when taking a world view of the purpose of higher education in a contemporary context 'disciplines' need to engage with each other in a way that values their distinctive

qualities but enables them to contribute without threat to a shared pedagogical, cultural and economic sustainability. The BSc. in Product Design represents a transitional model of the way in which different disciplines need to find a common collaborative discourse to cultivate a more productive future. The discipline knowledge that resides within the ‘parts’ is essential and in the formative discourse at its boundaries is transformative.

However, we must also recognise the practical context within which disciplines reside. The BSc. in Product Design exists in a place and time where resources are increasingly under threat. This presents a particular challenge which can only be addressed at a management and institutional level. This challenge relates to how the physical and people resources are distributed and valued across the program. It also relates to how recognition and responsibility are credited and valued. (This is a subject that demands further investigation.) A palpable tension exists across departments and schools regarding the allocation of resources, responsibility and reward. At present the cross-college demands of a program like the BSc. in Product Design have not been met with supporting infrastructure that enables the maximisation of resources. College structures remain centred on the traditional discipline based academic model and will inevitably need to be amended in the future. Where socialisation can bridge the gaps between disciplines at an academic level the difficulties at a management and institutional level appear to be increasingly complex. It is here that the various cultural manifestations of discipline, department, school and college that reside within the Institution require an Institutional culture that enables and fosters a different type of relationship between its diverse constituency.

The discipline, with its own distinct culture, remains the basic unit of contextualisation within higher education. Within an Institute of Higher Education it resides within a number of other cultural habitats. How the disciplines relate to each other is influenced by the dynamics of these other cultural habitats. The evidence from this research would suggest that the real strength of the BSc. in Product Design emanates from the strong discipline cultures that have developed within the traditional framework of the Dublin Institute of Technology. Evidence suggests that appropriate socialisation will enable ongoing development of the curriculum and its delivery. However, the potential that the program to contribute to a number of aspects of social, cultural, economic and pedagogic domains will only be fully realised with changes in the Institutional culture.

## Relationship Models

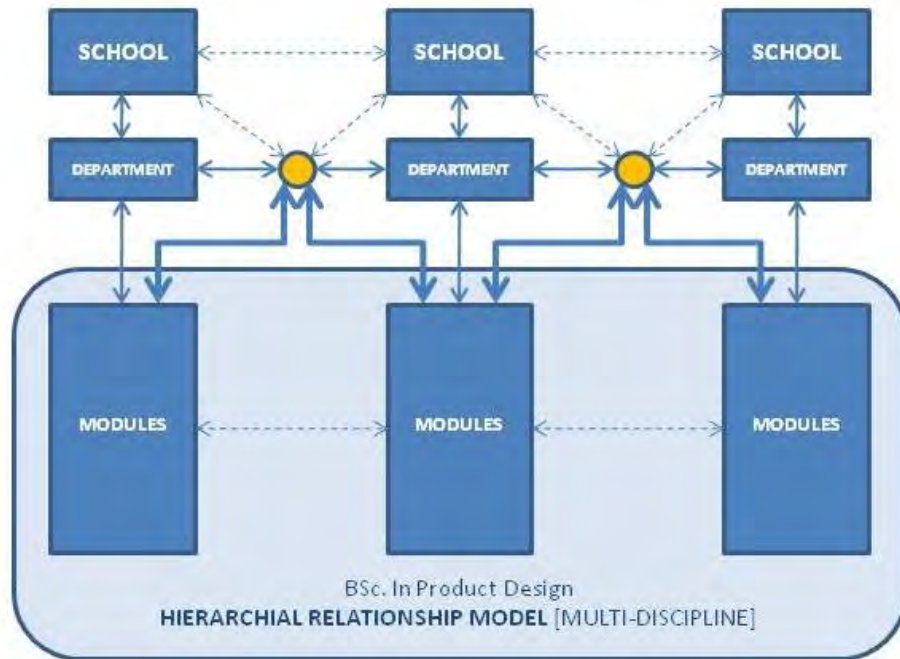


Figure 8. Multi-Discipline Relationship Model

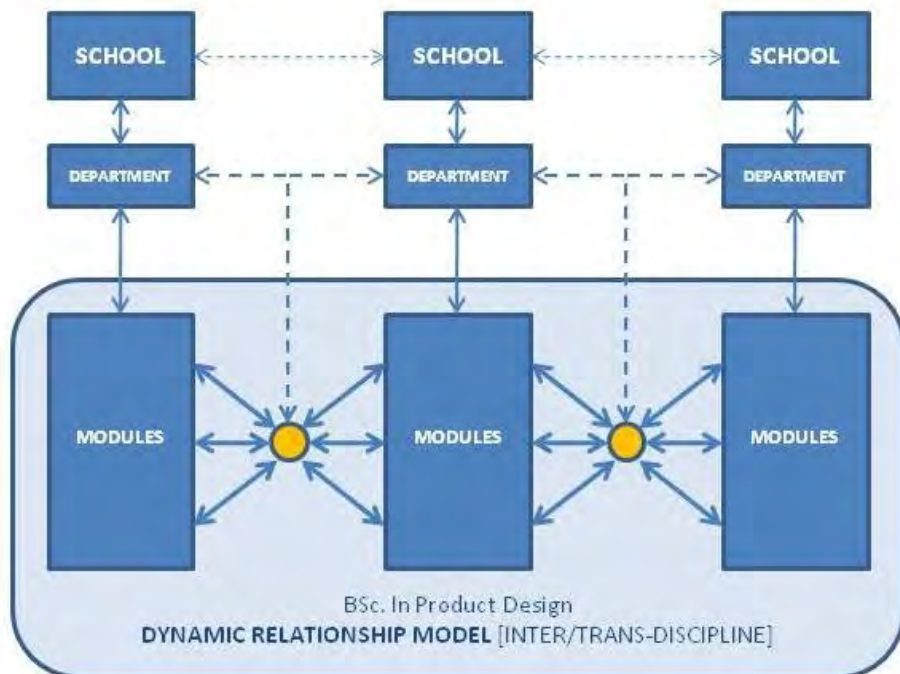


Figure 9. Inter/Trans Discipline Relationship Model

Different forms of relationship are necessary to enable the success of a program like the BSc. in Product Design. Figure 8 shows a model where the relationships are formal and operate mainly at a management level between the facilitating departments. This model enables a multi-disciplinary education to be delivered but little socialisation is enabled between the disciplines. This model represents the early stages of the BSc. in Product Design.

Figure 9 illustrates a relationship model which operates on an inter-disciplinary or trans-disciplinary intention. Here the relationships are less formal and more dynamic. Most of the interactions are between the academic staff crossing between their disciplines to form more effective educational interventions. Strong socialisation is an essential characteristic of this model enabling the dynamic interactions to be rich and meaningful.

## DISCUSSIONS

At the centre of this research is the discussion around discipline and cross-discipline discourse. An important consideration regarding this discourse is clarity regarding the meaning of the relevant terminologies. As seen from the literature there are differing perspectives on the meaning of these terms. As part of the research process the following reflections and observations have been made in order to derive an appropriate terminology.

The illustration below outlines a visual model for the relationship between the various disciplines as they are manifest within higher education systems.

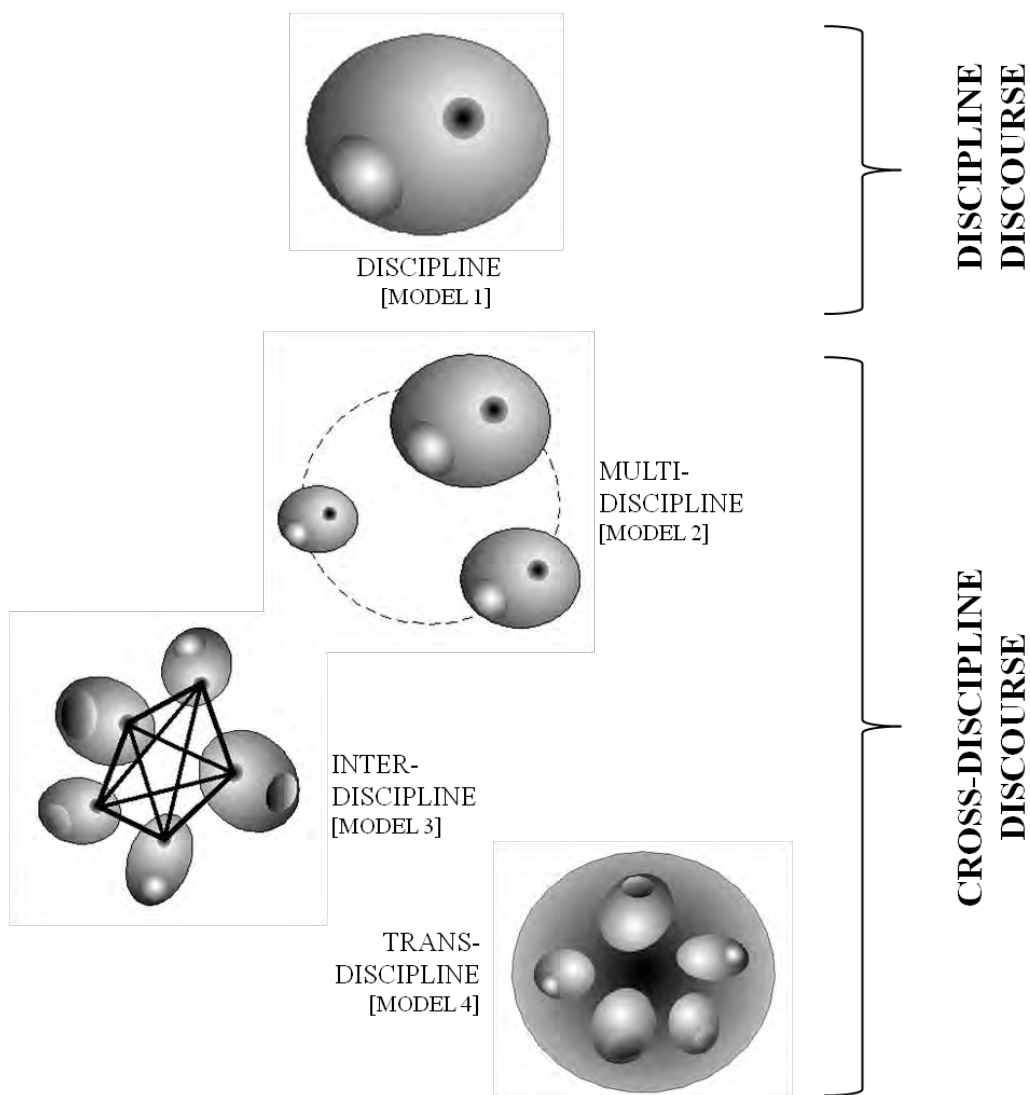


Figure 10. Disciplines in higher education systems

Figure 10. outlines a series of models which demonstrate the relationships that exist in higher education institutes. Model 1 relates to the discipline as a distinct definable entity which has



clear boundaries within which the ‘academics’ function and are sustained around a knowledge ‘nucleus’. Under the cross-disciplinary discourse category disciplines are demonstrated to have different degrees of relationship with each other. Model 2 is the multi-discipline, where the disciplines relate to each other in a peripheral manner while retain all the qualities of Model 1. The inter-discipline illustrated in Model 3 illustrates the various disciplines with very distinct linkages between each other. This discipline in this model relate to each other in an integrative manner. The trans-discipline illustrated in Model 4 merges the disciplines in a manner that suggests a fusion of disciplines. The trans-discipline model is the most evolved of the three cross-disciplinary models and can result from an evolution through the first three models. The illustration demonstrates the similarity between the discipline model and the evolved trans-discipline model. An evolutionary metaphor might suggest that there is ultimately an ecological imperative to evolve into new, more complex discipline models.

While these models illustrate an evolutionary, philosophical or even “bio-pedagogical” consideration of the disciplinary discourse, contextualising this in terms of the particular experience of the BSc. in Product Design is an important aspect of the research agenda.

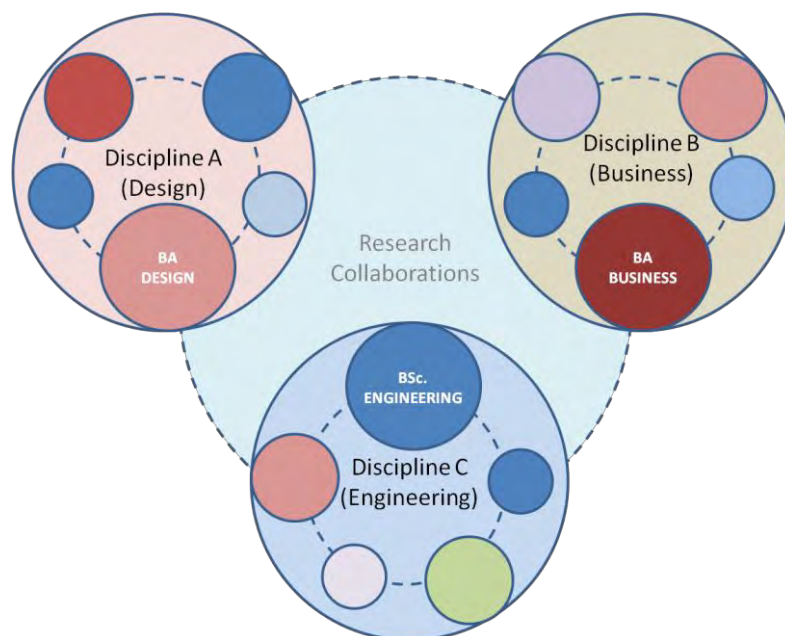


Figure. 11 Cross-disciplinary Model 2 – Multi-discipline

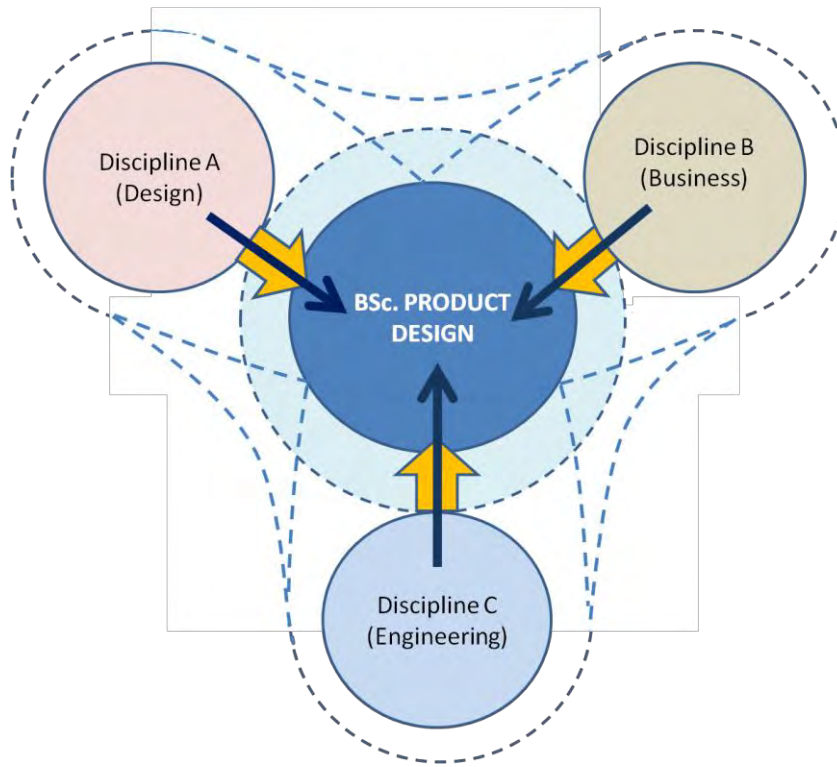


Figure 12. Cross-disciplinary Model 3 – Inter-discipline

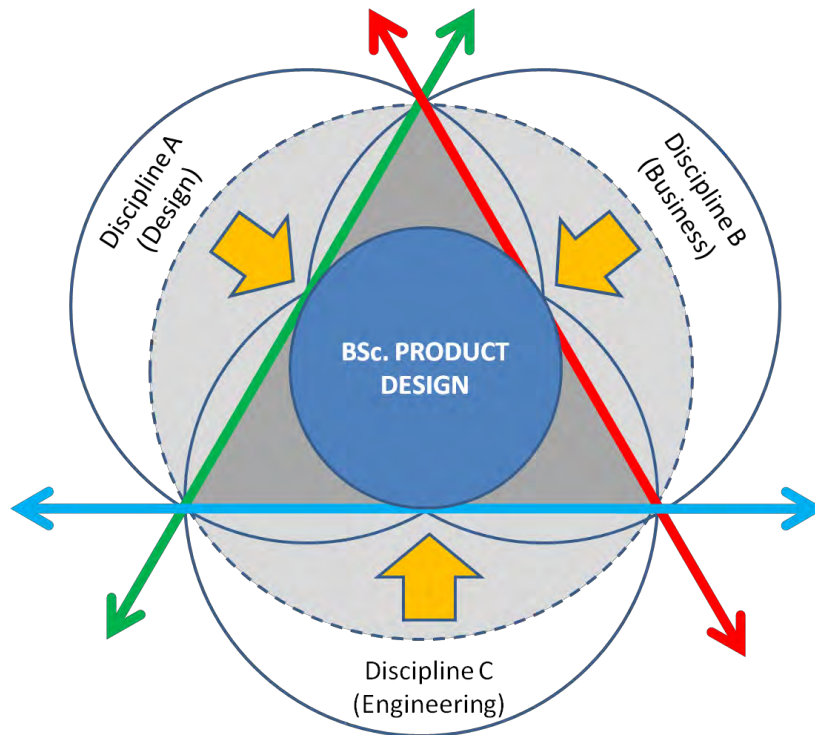


Figure 13. Cross-disciplinary Model 4 – Trans-Discipline

## **CURRICULUM DEVELOPMENT – IMPLICATIONS**

### **Discipline Models and Curriculum Development**

In terms of the development of curriculum, multi-discipline curriculum relies substantially on the existing discipline curriculum to maintain its knowledge integrity. Inter-discipline curriculum integrates discipline content and allows the discourse to mediate between the various contributions to the curriculum. The trans-discipline curriculum will assimilate key aspects of contributing disciplines to generate new theory at the intersection of the disciplines.

## RECOMMENDATIONS FOR FUTURE RESEARCH

A number of areas have emerged in the course of this study which warrant consideration for future research.

- a) The impact of socialisation on the development and delivery of academic programs in higher education is a particular aspect of academic culture. While socialisation was not the focus of the literature reviewed it emerged from within some of the literature as an aspect of the development of academic identities and constitutes a valid area to investigate. This was re-enforced from the research undertaken within this study where socialisation and relationship building were identified within the supporting narratives. The type of socialisation being referred to focuses on the construction of formal and informal relationships between staff, particularly from different disciplines, who are engaged in the development and/or delivery of academic or research activity.
  
- b) Clear discipline differences emerged in the responses to many of the questions and statements used in the research questionnaires that were issued to staff involved in the BSc. in Product Design. The nature and scale of this study did not allow for an in-depth interrogation of all of the data produced and an opportunity exists to focus on a number of key areas. The main areas for consideration that emerged out of the questionnaire include:
  - Research analysis of particular disciplines within departments to determine the perceptions among staff and students about the qualities that define the culture as experienced by them.
  - Research analysis of the differences in teaching and learning within the disciplines that constitute the BSc. in Product Design with a particular emphasis on teaching and assessment styles and how they can be negotiated in collaborative academic interventions.
  - Research analysis of the ways in which knowledge is constructed on cross-disciplinary educational interventions.

- Research investigation into how students construct their professional and academic identities on cross-disciplinary programs.
- c) There is a need to undertake research into the development of cross-disciplinary models for the development and delivery of higher education programs. These models need to have a more explicit frameworks for developing appropriate collaborations and relationship structures that facilitate in the construction of knowledge as a primary educational objective.
- d) Given the strong critical narrative around the physical separation of the three departments collaborating on the BSc. in Product Design, it would appear that there is a need to investigate the real and perceived impact of this type of physical multi - location has on the sense of ownership and belonging among both students and academic staff. This is all the more relevant as we increasingly deconstruct programs within modular frameworks and construct new virtual learning environments.

The breadth of the literature review and research investigation which were undertaken as part of this research have posed more questions than provided answers. The suggestions outlined above for further research are a small number of potential investigations that could be undertaken to expand the understanding and knowledge of the general field of cross-discipline and cross-college educational interventions and experiences.

## **SUMMARY & RECOMMENDATIONS**

The primary purpose of this study has been to investigate the impact of discipline cultures on the development and delivery of a cross-disciplinary undergraduate degree program. Having interrogated an extensive literature on the subject and having interrogated the specific context of the BSc. in Product Design, it is clear that discipline cultures do have a considerable impact on the development and delivery of a cross-disciplinary undergraduate degree program. However, the nature and extent of this impact is dependent on a multitude of general and specific contexts that are in continuous flux. While these are uncovered to some extent within this study much further work is required to develop a deeper understanding of the discipline specific contexts and cultural variables that construct the discipline landscape..

A secondary aim of the research has been to determine the nature of the changes that occur as a result of ‘tribes’ cohabitating on cross-discipline activity. These changes are subtle and incremental in character. Central to this discourse is the manner in which we engage in social knowledge construction and create new meaning and knowledge through an intellectual cohabitation of boundary issues. A reinterpretation and renegotiation of boundaries is a characteristic of building successful cross-discipline educational interventions.

There are specific recommendations that can be made in response to the findings of this research study. The research indicates that a commitment to the development of stronger relationship structures on the BSc. in Product Design between Arts and Engineering will continue to yield positive outcomes. However, the research also indicates that Business needs to be more integrated into that process or the potential of the cross-college intervention will never be fulfilled.

Cross-discipline higher education interventions like the BSc. in Product Design require considerable investment in time, management and relationship building to achieve appropriate collaborative and integrative actions. The experiences and assumptions that might prevail from within traditional discipline or department experiences do not translate into similar conditions that can be applied to cross-disciplinary educational interventions.

We need to respect the integrity of the discipline while exploiting its potential in new collaborative interventions. We also need to acknowledge that each of these interventions breaks new knowledge ground and we need to be patient and reflective in each endeavour.

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## **APPENDICES**

## APPENDIX A - Historical Context

In 1922, Ireland gained independence from Great Britain and the Irish Free State was established. However, Ireland at that time was predominantly agricultural and consequently inherited a very small and underdeveloped industrial sector. O'Malley (1992, p31) indicates that initially the Free State had no real policy around industrialisation, but eventually implemented an industrial policy which centred on protectionism. This protectionist policy enabled some industrial progress to be made through the 1930's and 1940's. However the potential for this development strategy was limited, and would not be sustainable in the long term. O'Malley (1992, p33) suggests the benefits of the policy came to a natural end by the 1950's.

In 1937, Sean Lemass, the then Minister for Industry and Commerce, created a departmental committee "to advise on matters affecting the design and decoration of articles". (Bodkin, 1949, p 37). According to Bodkin, (1949, p37) this committee met regularly over a two year period, but it made very little contribution to the development of policy, due largely to the onset of the second world war. However, it illustrated that at the highest levels of government the relevance of design was being recognised in the context of an economic and industrial discourse.

Professor Thomas Bodkin, Professor of Fine Arts and Director of the Barber Institute of Fine Arts in the University of Birmingham and a former Director of the National Gallery of Ireland, presented a report to the Irish Government in September 1949. Bodkin's *Report on the Arts in Ireland* was extremely critical of the lack of progress made in the Arts in general over previous decades. Bodkin included a significant chapter entitled "Design in Industry", in which he expressed his concern regarding how little Irish industry exhibited any sense of aesthetic values, commenting that, "There has never been a sustained alliance between the arts and industry in Ireland, and little has been done in the last fifty years to promote such a desirable aim" (Bodkin, 1949, p31)

While very few of Bodkin's recommendations were ever implemented, Turpin (1995, p254) argues that his report was consequential in the establishment of the Arts Council in 1951.

This newly formed Arts Council was given responsibility for the promotion of industrial design, resulting in two important exhibitions held during the 1950's.

The first of these was the International Design Exhibition 1954, which was produced by the Design Research Unit of Ireland. The aim of which was outlined in the exhibition catalogue, and had a stated intention, "to impress upon our people the vital importance of attractive craftsmanship in our industrial products, first because it helps to raise the standard of good taste and artistic judgement at home...and again because without it our exports cannot compete in world markets". (Exhibition Catalogue, 1954). This was to be achieved by demonstrating the work of prominent European designers. In one of the papers presented as part of the catalogue, E.A. Maguire a member of the Arts Council, outlined the important role of education in the development of design, suggesting that in order "To achieve good design, the manufacturer and his workmen must be educated in principles of good design. Taste can be acquired, and the purpose of this exhibition is to help in this matter."(Exhibition Catalogue, 1954)

The second exhibition, held in 1956, entitled *The Irish Design Exhibition* was aimed at the promotion of Irish Design goods to the home market. In a quote from the exhibition catalogue it is stated: "This is the first Irish Exhibition of its kind. It is not an exhibition of industrial products as such, but of industrial design, an exhibition of art applied to industry." (Exhibition Catalogue, 1954). E.A. Maguire in an essay contained in the second exhibition catalogue stated that the designer was to "subordinate his design to his machine, to the resources and requirements of his employer and to the desires of the consuming public". (Exhibition Catalogue, 1954)

However, unemployment and emigration continued to dominate the social and economic landscape in the 1950's. The limited success of the early protectionist policies had begun to fade and there was recognition of the need for the economic emphasis to shift to more outward looking policies. There was a need to develop industrial exports, and the government saw fit to encourage and assist companies to develop production for export with a variety of support measures.

It was in this new outward looking climate that the Irish Export Board, C oras Tr acht ala (CTT), was set up in 1952. Responsibility for improving standards of industrial design in

Ireland was transferred to CTT from the Arts Council in 1960 and by 1961, it had established a design section. One of the earliest actions of this design section was to invite a group of eminent Scandinavian designers to Ireland to report on the state of design in the country. A five-man team of “Industrial designers and teachers of design, of international reputation” from Denmark, Finland and Sweden, spent two weeks visiting factories, colleges, museums and shops. Their visits included the College of Commerce, Rathmines, and the College of Technology, Bolton Street, both of which are now part of the Dublin Institute of Technology. Their report, *Design in Ireland*, (Franck, et al., 1962), published by the Export Board in 1962 was highly critical of the level of design awareness in industry, however, it did offer a positive prospect for the future in suggesting that:

Ireland, by virtue of her lack of sophistication in matters of design, has a unique opportunity, denied by circumstances to many more developed countries, of making a great contribution, not alone to her own prosperity and culture, but to the culture of Western Europe. We believe that with courage and foresight the possibilities can be realised. (p4)

Of parallel importance to the findings of the report itself, was the unambiguous nature of the commitment being made by Irish Government, through the agency of CTT, to the importance of design as a feature of the future development of the state. In the foreword to the Scandinavian Design Group Report, acknowledgement was made to the fact that:

Good design is an undeniable necessity to the growth of our export trade, but standards cannot be raised for export goods only. The factors which determine the quality, good or bad, of the designs we produce are deeply rooted in our homes, our schools, our shops, our historic traditions; our whole way of living.(p xi)

Turpin (1995, p259), refers to the report as “a manifesto for modernism in Ireland”, suggesting it to be the “most controversial one on the visual arts ever written”. The report voiced criticism of a variety of aspects of Irish Design, arguing that “Lasting results, however, cannot be hoped for unless the vital matter of design education is tackled with energy and foresight. We think it is impossible for Ireland to make progress in Design without a radical change in existing educational institutions” (Franck, et al, 1962, p40).

While controversial in its observations and recommendations, the “Scandinavian Design Group Report” as it has become known, did provide the impetus for a number of significant interventions from a design education perspective. Kilkenny Design Workshops was established under the direction of William H. Walsh in 1963 and as Marchant & Addis (1985, p9) point out, would provide “a more permanent implant of design skills through an organisation which would have a pervasive and lasting influence on industry and on the Irish people generally, bring with it advantages of training and continuity of experience and ensure empathy with the problems peculiar to Irelands industries”. A Council of Design was also established in 1963. Part of its remit according to Turpin, (1995, p 264), “was to advise on the training of industrial designers in state establishments, design policy in general , and on fostering links between industry and the School of Design of the National College of Art”.

CTT and the Department of Education sponsored an Industrial Design Education Seminar, held in late 1970. Contributions were made by leading Irish and International educators and designers and a number of recommendations were made at the end of the Seminar which were outlined in a seminar report (p1-2). These included recognitions of the need for visual education in primary and secondary schools, the need in Irish industry for industrial designers, the need for government policy on art and design education, a call for Industrial design education to be recognised at University level, with post graduate opportunities provided in industrial design (engineering). (p 1-2)

In a report entitled Provision for the Arts, published in 1976, Richards (1976) presents his findings on the status of “Industrial Design and Crafts”. While there was an acknowledgement of the improvements being made at the National College of Art & Design, Richards makes the point that it is “dependent on action by the Department of Education, which was slow and ineffective” (p 83,20.2), most reference in this area was given to the work of the Kilkenny Design Workshops (pp 83-84, 20-3 to 20-12 & 20.15), with cautious praise for the extent of its influence but acknowledging concern at the fact that “after nine years only three of the 15 full-time professional designers are Irish.” (p84).

Turpin (1995, p268) suggests that the setting up of the Department of Industrial Design at the National College of Art & Design in partnership with the National Institute of Higher Education in Limerick in 1976, as well as the establishment of a Design Studies Board in the same year, by the National Council for Education Awards (NCEA), were significant steps in

the development of design education in Ireland. The NCEA enabled a proliferation of craft and design courses to develop in the Regional Technical Colleges, broadening the development of the sector on a national basis. By the 1980's degree status was given to design programs at the National College of Art & Design, with the Dublin Institute of Technology providing degrees in design in the 1990's.

In 1985 Kilkenny Design Workshops published *Kilkenny Design, Twenty One Years of Design in Ireland*, and produced an accompanying exhibition which celebrated the national and international success of the organisation. However, by 1988, Kilkenny Design Workshops were closed. The political vision that was evident in the late 1950s was nowhere in sight and KDW disappeared without a whimper. Ironically it was in some respects a victim of the recessionary climate where once again emigration and unemployment became prominent features of the economic and social landscape of Ireland.

In November 1993, the National Economic and Social Committee indicated in their annual report that, "The future growth of Irish industry requires a competitiveness which is founded on appropriate cost structures, but which is supplemented critically by strengths in "intangible" areas such as management, marketing, innovation, technology and design. (p265). Thirty years on from the 'Scandinavian Design Groups Report on Design in Ireland' the deficit was still evident in the repetitive reporting of activities and achievements or lack of. In May 1999 another report, entitled "Opportunities in Design – Strategies for Growth in the Irish Design Sector" was published by Enterprise Ireland. Like so many reports before, it was critical of many aspects of the sector, however it gave particular consideration to the state of the design education sector in a section entitled, "The issues and Factors impacting upon the Development of Design in Ireland". Among a number of observations made were two important points. The first related to the "apparent lack of dialogue and collaboration both between colleges and within colleges (i.e. inter-design department)." and the second outlined the need for a "Greater emphasis needs to be placed on - innovation and creativity in design, business and the commercial aspects of design, marketing, communication and strategic planning skills".

Another report, also published in 1999, called the Technology Foresight Report; materials and manufacturing Processes (ICSTI, 1999) stated that "innovative product design and its implementation in production processes are felt to be the main drivers for materials", in early

2003, around the time the BSc. In Product Design was validated, The Irish Council for Science, Technology & Innovation (ICSTI) issued a statement on design which proposes that the systematic and strategic use of design for new product development is crucial to the achievement of national policy objectives.

This brief historical outline of the development of the design sector in Ireland only touches on some of the critical dates and activities that have informed the evolution of design in Ireland. However, while it is evident that there has been strategic appreciation of the role that design can play in the development of the social and economic wellbeing of the nation the evidence also suggests that the interventions themselves, while well meaning, are not strategically managed. This background and the continued call for appropriate strategic interventions were central to the discourse that resulted in the development of the BSc. in Product Design at the Dublin Institute of Technology.



## **APPENDIX B. Research Questionnaire [a]**

## RESEARCH QUESTIONNAIRE <sup>[a]</sup>

The following questionnaire is part of the research requirement for the MA in Higher Education.

*The title and context of the research is in relation to the following research question:*

### Old Tribes, New Tribes

**To what extent do discipline cultures impact on the development and delivery of cross-disciplinary undergraduate degree programs?**

**A case study of the BSc in Product Design at the Dublin Institute of Technology.**

Dear Colleague,

My name is Robert Tully and I have been a lecturer with DIT since 1989. I am located in the School of Art, Design and Printing and have been lecturing on the BSc. in Product Design since 2003.

Research has shown that different disciplines have different cultures within higher education. It is this difference that I am interested in, particularly in relation to how they co-exist on a cross-college, multi-disciplinary program like the BSc in Product Design.

This research is important to enable us to understand how to construct effective cross-college, multi-disciplinary educational interventions and to maximise the potential of the valuable resources available within the institute.

Your participation in this research is, of course voluntary. Your confidentiality and anonymity are assured. Further, you will not be identified in the thesis or in any report or publication based on this research. There are no known or anticipated risks to participation in this study. The data collected through this study will be kept for a period of 5 years in a secure location. Return of the survey serves as consent.

I greatly appreciate your participation in this research. The survey should take approximately 30 to 40 minutes to complete.


If there are any questions that you prefer not to answer, you may skip them. If you would like to write additional comments on the questionnaire, please feel free to do so.

**Please return this questionnaire to reach me, no later than Wednesday 20<sup>th</sup> April, by email to [Robert.tully@dit.ie](mailto:Robert.tully@dit.ie) or by post to Robert Tully, DIT, School of Art, Design & Printing, 40-45 Mountjoy Square, Dublin 1.**

Thank you for your interest and participation in this study. If you have any questions or concerns in relation to the questionnaire please do not hesitate to contact me on 086-8248703 or on [robert.tully@dit.ie](mailto:robert.tully@dit.ie)

Sincerely,

Robert Tully.

**Note:** Boxes can be activated using the highlight function in MS word. On the **Home** tab, in the **Font** group, click the arrow next to **Text Highlight Color**  or place an 'x' beside the box

For Office use only:	Reference Code: <b>102E</b>	Date Sent: 12-4-2011 Date Received: Reviewed:
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## Section A

*Please provide a detailed answer to the following questions*

(a) Describe the major differences involved in the implementation and management of the BSc in Product Design as a cross-college program as distinct from the general programs within your school or department.

(b) What have been the major difficulties experienced (if any) in the implementation of the program

(c) If there were difficulties in the implementation and management of the program how have they, or are they resolved

(d) What are the major strengths of the BSc. In Product Design?

(e) Do you believe that the current structure of the BSc in Product design is best suited to the on-going development of the program?

[Elaborate on your answer.]

(f) Do you meet your management colleagues involved in the BSc in Product Design on a regular basis?

[Elaborate on your answer.]

(g) With what you have learned from your experience of the development, implementation and management of the BSc. In Product Design, what recommendations would you make for similar cross-college educational interventions in the future?

(h) What do you see as the role of management in the development and implementation of cross-college programs of this nature?

## Section B

(a) Have you read the course document for the BSc in Product Design in the past two years?

- yes
- no

(b) Is it necessary to have read the course document in order to deliver a module on the program

- yes
- no

(c) Are you clear on the role of all the various modules that constitute the program.

- very clear
- clear
- Undecided
- not very clear
- not at all clear

(d) Are you familiar with the course structure of the BSc in product design?

- very familiar
- familiar
- Undecided
- not very familiar
- not at all familiar

(e) In terms of the content of the course document, how should the syllabus be adhered to?

- strictly in accordance
- somewhat in accordance
- Undecided
- occasionally in accordance
- not at all in accordance

(f) How important is it for staff teaching on the program to have an overall picture of the module structure for the BSc in Product Design?

- very important
- important
- Undecided
- not important
- not important at all

**If you wish to elaborate on any of the points outlines above please do so in the space provided below and if necessary on the back of this sheet.** If completing in digital format, allow the text box below to expand as required. If your response is directly relevant to one of the statements above please use the statement letter ie (a) or (b) etc, to identify it.

## Section C

Tick 1 box in each category which suggests what you believe represents the appropriate quality of a good **product designer**. An alternative choice is proposed if you cannot make a choice from the primary list

- Visual, focusing on images and symbols**  
 **Verbal, focusing on words and language**  
*Neither*   
*Both*

- Analytical**  
 **Intuitive**  
*Neither*   
*Both*

- Process ideas simultaneously**  
 **Process ideas sequentially**  
*Neither*   
*Both*

- Make logical deductions**  
 **Make lateral connections**  
*Neither*   
*Both*

- Organised**  
 **Disorganised**  
*Neither*   
*Both*

- Follows rules**  
 **Questions rules**  
*Neither*   
*Both*

- Knowing**  
 **Believing**  
*Neither*   
*Both*

- Safe**  
 **Risk Taker**  
*Neither*   
*Both*



## Section D

Please provide any additional information you feel is relevant to this research

Thank you once again for your assistance,  
Yours,

Robert Tully.  
(086-8248703, Robert.tully@dit.ie, rtully@indigo.ie)

**APPENDIX B – Research Questionnaire [b]**

# RESEARCH QUESTIONNAIRE <sup>[b]</sup>

The following questionnaire is part of the research requirement for the MA in Higher Education.  
*The title and context of the research is in relation to the following research question:*

## Old Tribes, New Tribes

**To what extent do discipline cultures impact on the development and delivery of cross-disciplinary undergraduate degree programs?**

**A case study of the BSc in Product Design at the Dublin Institute of Technology.**

Dear Colleague,

My name is Robert Tully and I have been a lecturer with DIT since 1989. I am located in the School of Art, Design and Printing and have been lecturing on the BSc. in Product Design since 2003.

Research has shown that different disciplines have different cultures within higher education. It is this difference that I am interested in, particularly in relation to how they co-exist on a cross-college, multi-disciplinary program like the BSc in Product Design.

This research is important to enable us to understand how to construct effective cross-college, multi-disciplinary educational interventions and to maximise the potential of the valuable resources available within the institute.

Your participation in this research is, of course voluntary. Your confidentiality and anonymity are assured. Further, you will not be identified in the thesis or in any report or publication based on this research. There are no known or anticipated risks to participation in this study. The data collected through this study will be kept for a period of 5 years in a secure location. Return of the survey serves as consent.

I greatly appreciate your participation in this research. The survey should take approximately 30 to 40 minutes to complete.


If there are any questions that you prefer not to answer, you may skip them. If you would like to write additional comments on the questionnaire, please feel free to do so.

**Please return this questionnaire to reach me, no later than Wednesday 20<sup>th</sup> April, by email to [Robert.tully@dit.ie](mailto:Robert.tully@dit.ie) or by post to Robert Tully, DIT, School of Art, Design & Printing, 40-45 Mountjoy Square, Dublin 1.**

Thank you for your interest and participation in this study. If you have any questions or concerns in relation to the questionnaire please do not hesitate to contact me on 086-8248703 or on [robert.tully@dit.ie](mailto:robert.tully@dit.ie)

Sincerely,

Robert Tully.

**Note:** Boxes can be activated using the highlight function in MS word. On the **Home** tab, in the **Font** group, click the arrow next to **Text Highlight Color**  or place an 'x' beside the box

For Office use only:	Reference Code: <b>100A/B/E</b>	Date Sent: 12-4-2011 Date Received: Reviewed:
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## Section A Part 1a

*This section sets out to provide some context regarding the experience and background of the staff member and where that is located in the institute*

(a) Are you currently employed by or contracted to DIT		Yes <input type="checkbox"/>	No <input type="checkbox"/>
(a) Which of the following Colleges of the Dublin Institute of Technology are/were you employed by or contracted to.	College of Engineering and Built Environment	<input type="checkbox"/>	
	College of Arts and Tourism	<input type="checkbox"/>	
	College of Business	<input type="checkbox"/>	
	Uncertain	<input type="checkbox"/>	
(b) Which School of the Dublin Institute of Technology are/were you employed by or contracted to.	School of Art, Design & Printing	<input type="checkbox"/>	
	School of Marketing	<input type="checkbox"/>	
	School of Manufacturing and Design Engineering	<input type="checkbox"/>	
	Uncertain	<input type="checkbox"/>	
(c) Are you a member of any professional body or professional organisation which represents your discipline?		Yes <input type="checkbox"/>	No <input type="checkbox"/>
(d) List the professional bodies or professional organisations of which you are a member:			
(e) Which of the following sentences is <u>most appropriate</u> to how you see yourself professionally: Tick the box beside the one that is most appropriate. (Please tick one box only)			
I associate my professional identity with my teaching role		<input type="checkbox"/>	
I associate my professional identity with my research interests		<input type="checkbox"/>	
I associate my professional identity with my professional or academic qualification, i.e. "An engineer", "A Solicitor" etc		<input type="checkbox"/>	
I associate my professional identity with a role of responsibility, "Manager", "Co-ordinator" etc.		<input type="checkbox"/>	
Other: Please describe :		<input type="checkbox"/>	
Uncertain:		<input type="checkbox"/>	
(f) Are you engaged in <b>research</b> linked to your discipline		Yes <input type="checkbox"/>	No <input type="checkbox"/>
If Yes then please provide details if appropriate:			
(g) Are you engaged in <b>consultancy</b> linked to your discipline		Yes <input type="checkbox"/>	No <input type="checkbox"/>
If Yes then please provide details if appropriate:			

**Section A Part 1b**

*This section sets out to provide some general context*

<p>(a) Please indicate which years you have taught on the BSc in Product Design at the Dublin Institute of Technology.</p> <p>Please tick all of the relevant boxes.</p>	<table style="width: 100%; border: none;"> <tr><td style="border: none;">2003-2004</td><td style="border: none; text-align: right;"><input type="checkbox"/></td></tr> <tr><td style="border: none;">2004-2005</td><td style="border: none; text-align: right;"><input type="checkbox"/></td></tr> <tr><td style="border: none;">2005-2006</td><td style="border: none; text-align: right;"><input type="checkbox"/></td></tr> <tr><td style="border: none;">2006-2007</td><td style="border: none; text-align: right;"><input type="checkbox"/></td></tr> <tr><td style="border: none;">2007-2008</td><td style="border: none; text-align: right;"><input type="checkbox"/></td></tr> <tr><td style="border: none;">2008-2009</td><td style="border: none; text-align: right;"><input type="checkbox"/></td></tr> <tr><td style="border: none;">2009-2010</td><td style="border: none; text-align: right;"><input type="checkbox"/></td></tr> <tr><td style="border: none;">2010-2011</td><td style="border: none; text-align: right;"><input type="checkbox"/></td></tr> </table>	2003-2004	<input type="checkbox"/>	2004-2005	<input type="checkbox"/>	2005-2006	<input type="checkbox"/>	2006-2007	<input type="checkbox"/>	2007-2008	<input type="checkbox"/>	2008-2009	<input type="checkbox"/>	2009-2010	<input type="checkbox"/>	2010-2011	<input type="checkbox"/>
2003-2004	<input type="checkbox"/>																
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2005-2006	<input type="checkbox"/>																
2006-2007	<input type="checkbox"/>																
2007-2008	<input type="checkbox"/>																
2008-2009	<input type="checkbox"/>																
2009-2010	<input type="checkbox"/>																
2010-2011	<input type="checkbox"/>																
<p>(b) Please list the subjects which you teach/taught on the BSc in Product Design at the Dublin Institute of Technology. Also list the year group to which you teach/taught each subject:</p> <p>Note: (You do not need to use precise codes or titles to fill out this section, As these changed on a number of occasions).</p>	<table style="width: 100%; border: none;"> <tr><td style="border: none;">Subject _____</td><td style="border: none;">Year _____</td></tr> <tr><td style="border: none;">Subject _____</td><td style="border: none;">Year _____</td></tr> <tr><td style="border: none;">Subject _____</td><td style="border: none;">Year _____</td></tr> <tr><td style="border: none;">Subject _____</td><td style="border: none;">Year _____</td></tr> <tr><td style="border: none;">Subject _____</td><td style="border: none;">Year _____</td></tr> <tr><td style="border: none;">Subject _____</td><td style="border: none;">Year _____</td></tr> </table>	Subject _____	Year _____	Subject _____	Year _____	Subject _____	Year _____	Subject _____	Year _____	Subject _____	Year _____	Subject _____	Year _____				
Subject _____	Year _____																
Subject _____	Year _____																
Subject _____	Year _____																
Subject _____	Year _____																
Subject _____	Year _____																
Subject _____	Year _____																
<p>(c) If you have taught for more than 2 academic years on the BSc in Product Design, what, in your opinion are the main changes that have occurred in that time?</p>																	
<p>(d) Please indicate what you believe is the current % of involvement of 'colleges' (Faculties) on the BSc in Product Design. Also indicate what percentage you feel would be appropriate to improve the program.</p> <table style="width: 100%; border: none; margin-top: 10px;"> <thead> <tr> <th style="width: 40%;"></th> <th style="width: 20%; text-align: center;">Current (perception)</th> <th style="width: 20%; text-align: center;">Proposed (view point)</th> </tr> </thead> <tbody> <tr> <td>Engineering (Bolton Street)</td> <td style="text-align: center;"><input style="width: 80%;" type="text"/> %</td> <td style="text-align: center;"><input style="width: 80%;" type="text"/> %</td> </tr> <tr> <td>Business (Aungier Street)</td> <td style="text-align: center;"><input style="width: 80%;" type="text"/> %</td> <td style="text-align: center;"><input style="width: 80%;" type="text"/> %</td> </tr> <tr> <td>Design (Mountjoy Square)</td> <td style="text-align: center;"><input style="width: 80%;" type="text"/> %</td> <td style="text-align: center;"><input style="width: 80%;" type="text"/> %</td> </tr> </tbody> </table>			Current (perception)	Proposed (view point)	Engineering (Bolton Street)	<input style="width: 80%;" type="text"/> %	<input style="width: 80%;" type="text"/> %	Business (Aungier Street)	<input style="width: 80%;" type="text"/> %	<input style="width: 80%;" type="text"/> %	Design (Mountjoy Square)	<input style="width: 80%;" type="text"/> %	<input style="width: 80%;" type="text"/> %				
	Current (perception)	Proposed (view point)															
Engineering (Bolton Street)	<input style="width: 80%;" type="text"/> %	<input style="width: 80%;" type="text"/> %															
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Design (Mountjoy Square)	<input style="width: 80%;" type="text"/> %	<input style="width: 80%;" type="text"/> %															

**If you wish to elaborate on any of the points outlined above please do so in the space provided below and if necessary on the back of this sheet.** If your response is directly relevant to one of the statements above please use the statement letter ie (a) or (b) etc, to identify it

### Section A Part 1c

*This section sets out to determine if staff on the program have specific experience of product design.*

<p>(a) Have you worked in industry as a product designer? If Yes then please provide details:</p>	Yes <input type="checkbox"/>	No <input type="checkbox"/>
<p>(b) If your answer to both (a) and (b) is No then have you worked in industry in collaboration with product designers or product engineers If Yes then please provide details:</p>	Yes <input type="checkbox"/>	No <input type="checkbox"/>
<p>(c) Have you studied for a formal design qualification at either degree or post graduate level: (If Yes then please provide details)</p>	Yes <input type="checkbox"/>	No <input type="checkbox"/>
<p>(d) Have you studied for a formal engineering qualification at either degree or post graduate level: (If Yes then please provide details)</p>	Yes <input type="checkbox"/>	No <input type="checkbox"/>

**If you wish to elaborate on any of the points outlines above please on the back of this sheet.** If your response is directly relevant to one of the statements above please use the statement letter ie (a) or (b) etc, to identify it

## Section A Part 2

### *Culture of Collaboration*

*These questions seek to determine the breadth of experience of Staff across other programs at DIT*

(a) Do you teach or have you taught on the BSc in Product Design If your answer is No please indicated your relationship to the program:	Yes <input type="checkbox"/>	No <input type="checkbox"/>
(b) Are you involved in the management of the program If your answer is Yes please indicated your involvement in the program: ( <i>year co-ordinator, etc</i> )  Describe role:	Yes <input type="checkbox"/>	No <input type="checkbox"/>
(c) Do you teach on any program other than the BSc in Product Design in your department:  Indicate Programs:	Yes <input type="checkbox"/>	No <input type="checkbox"/>
(d) Do you teach on any program outside your department but within your school?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
(e) Do you teach on any other program outside your school	Yes <input type="checkbox"/>	No <input type="checkbox"/>
(f) Do you teach on any other multi-disciplinary programs (multi-disciplinary program for the purpose of this question refers to programs which draw on teaching resources from different colleges of DIT)	Yes <input type="checkbox"/>	No <input type="checkbox"/>
(g) Have you undertaken collaborative activity with colleagues from other schools or departments on the BSc in product design?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
(h) If your answer to (g) was yes, provide an outline of the type of collaboration undertaken and an indication of whether you found it positive or negative:		

**If you wish to elaborate on any of the points outlines above please do so in the space provided below and if necessary on the back of this sheet.** If your response is directly relevant to one of the statements above please use the statement letter i.e. (a) or (b) etc., to identify it

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### Section A Part 3

#### Structure of collaboration

These questions seek to determine the structure of multi-disciplinary activity within the colleges

	Strongly Disagree	Disagree somewhat	Uncertain	Agree somewhat	Strongly Agree
(a) The structure of the program is conducive to collaborative active	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(b) Collaboration between disciplines is a positive characteristic of the BSc in Product Design.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(c) Increased contact between staff from different disciplines would improve collaboration on the program.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(d) In general <b>students</b> of the BSc in Product Design understand the rationale behind the collaboration between schools on this program	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(e) In general <b>staff</b> of the BSc in Product Design understand the rationale behind the collaboration between schools on this program	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(f) The structure of the BSc in Product Design is appropriate to the needs of the programme.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(g) The synergies between the schools are natural and appropriate for the delivery of a BSc in product design.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(h) I understand the relationship between the various modules over the 4 years of the program.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(i) The current balance of subjects is appropriate to the development of a product designer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(j) There is adequate contact between the different disciplines on the BSc in Product Design	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(k) I am aware of the <b>teaching</b> methods used in other areas?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(l) I am aware of the <b>assessment</b> methods used in other areas?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(m) The management style in the organisation is characterised by teamwork, consensus and participation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**If you wish to elaborate on any of the points outlines above please do so in the space provided below and if necessary on the back of this sheet.** If your response is directly relevant to one of the statements above please use the statement letter ie (a) or (b) etc, to identify it



## Section A Part 4

### *Culture of disciplines*

Cultures are defined in a variety of ways - as shared philosophies, ideologies, values, assumptions, expectations, attitudes, and norms shared within a community (*Kilmann, et al, 1985; Peterson & Spencer, 1990*).

	Strongly Disagree	Disagree somewhat	Uncertain	Agree Somewhat	Strongly Agree
(a) <b>Disciplines</b> within higher education institutes have distinct cultures.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(b) <b>Departments</b> within higher education institutes have distinct cultures.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(c) <b>Schools</b> within higher education institutes have distinct cultures.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(d) Cooperation between disciplines is affected by the nature of their disciplinary cultures:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Please elaborate on your answer to (d) above:					
(e) How would you describe the discipline differences between your school and the two other schools contributing to the programme: <input type="checkbox"/> Complementary <input type="checkbox"/> Facilitating                      Other: <input type="text"/> <input type="checkbox"/> Non Complementary <input type="checkbox"/> Compatible <input type="checkbox"/> Intransient <input type="checkbox"/> Non Compatible					
(f) There should be more focus on collaboration between discipline areas to create new synergies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(g) A barrier to collaboration on the BSc in Product Design are the prevailing institutional structures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(h) Collaboration offers new opportunity to develop the program.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(i) The program would develop more effectively without constructing collaborations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**If you wish to elaborate on any of the points outlines above please do so in the space provided on the back of this sheet.** If your response is directly relevant to one of the statements above please use the statement letter ie (a) or (b) etc, to identify it

## Section A Part 5

### *Culture of disciplines*

Cultures are defined in a variety of ways - as shared philosophies, ideologies, values, assumptions, expectations, attitudes, and norms shared within a community (*Kilmann, et al, 1985; Peterson & Spencer, 1990*).

	Strongly Disagree	Disagree somewhat	Uncertain	Agree somewhat	Strongly Agree
(a) There should be more focus on the <b>strength</b> of disciplines and less on collaboration between them.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(b) There should be more focus on <b>collaboration</b> between discipline areas to create new synergies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(c) There is adequate contact between the different disciplines on the BSc in Product Design	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(d) There should be more focus on the <b>engineering</b> content of the BSc in Product Design	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(e) There should be more focus on the <b>creative design</b> content of the BSc in product design	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(f) There should be more focus on the <b>business</b> content of the BSc in Product Design	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(g) The separate campus locations for delivery of the BSc in Product Design is a positive experience for students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(h) Your own experience of being a student in Higher Education has informed your view of discipline identity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(i) The separate campus locations for delivery of the BSc in Product Design facilitate the students in experiencing the diversity of disciplines on location.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(j) It is important for students in Higher Education to identify with a particular academic culture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(k) There are considerable differences in how arts, engineering, and business address the teaching and assessment of academic content.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(l) It is important for all staff delivering on a program like the BSc in Product design to be aware of the teaching and assessment methods used by other disciplines.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(m) Students are aware of the differences between the discipline cultures that exist in the program	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(n) Course leaders should construct the modules and direct staff to collaborate as appropriate (top Down)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(o) Module lecturers should seek to generate synergies between disciplines as they see appropriate and construct new module content (bottom up)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**If you wish to elaborate on any of the points outlines above please do so in the space provided on the back of this sheet.** If your response is directly relevant to one of the statements above please use the statement letter ie (a) or (b) etc, to identify it

## Section A Part 6

### *Culture of disciplines*

Cultures are defined in a variety of ways - as shared philosophies, ideologies, values, assumptions, expectations, attitudes, and norms shared within a community (*Kilmann, et al, 1985; Peterson & Spencer, 1990*).

	Strongly Disagree	Disagree Somewhat	Neither Agree or Disagree	Agree Somewhat	Strongly Agree
(a) All disciplines should teach in a similar way in higher education	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(b) All assessment methods should be similar in higher education.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(c) A mix of teaching and assessment methods enhances the breadth of the programme	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**If you wish to elaborate on any of the points outlines above please do so in the space provided below and if necessary on the back of this sheet.** If your response is directly relevant to one of the statements above please use the statement letter ie (a) or (b) etc, to identify it

## Section A Part 7

*These statements set out to determine how staff involved in the BSc in product design perceive their subject and discipline in the general context of academic knowledge*

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
(a) My discipline area is well defined	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(b) My discipline area must be protected and defended	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(c) I associate my academic discipline with an external professional discipline	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(d) There is a clear perception of my discipline externally	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(e) My subject specialism is well defined	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(f) The boundaries of my subject specialism are flexible	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(g) Discipline knowledge is the most legitimate form of knowledge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(h) My discipline area has a very clear approach to how it should be taught	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(i) My discipline area has a very clear approach to how it should be assessed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(j) My discipline area can accommodate different ways of teaching and assessment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(k) My discipline uses very different teaching and assessment methods to other disciplines on the BSc in product design	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(l) Different teaching and assessment methods on the BSc in product design confuse the students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**If you wish to elaborate on any of the points outlines above please do so in the space provided below and if necessary on the back of this sheet.** If your response is directly relevant to one of the statements above please use the statement letter ie (a) or (b) etc, to identify it

## Section A Part 8

*Aim to determine staff opinions on interdisciplinary activity as a general aspect of academic culture*

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
(a) The interdisciplinary approach lacks disciplinary rigour	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(b) Engaging in interdisciplinary work may lead to academics becoming 'jack of all trades and master of none'.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(c) An interdisciplinary approach contributes to the growth of knowledge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(d) Working across discipline boundaries improves teaching practice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(e) Real world issues and problems should be the focus of educational activity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(f) Many problems and/or issues cannot be defined or understood by a single discipline and require an interdisciplinary approach.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(g) Interdisciplinary studies at undergraduate level will weaken the knowledge base of established disciplines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**If you wish to elaborate on any of the points outlines above please do so in the space provided below and if necessary on the back of this sheet.** If your response is directly relevant to one of the statements above please use the statement letter ie (a) or (b) etc, to identify it

### Section B Part 1

The statements below aim to determine staff opinions on interdisciplinary activity in relation to the student context

	Strongly Disagree	Disagree Somewhat	Uncertain	Agree Somewhat	Strongly Agree
(a) The advance of specialisation has rendered many disciplines too complex for undergraduate study	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(b) Discipline specialisation would be best placed at post graduate level in order to provide an interdisciplinary base to a student's overall study	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(c) Students must first reach a deep understanding and knowledge of disciplines before they can tackle study across disciplines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(d) I prefer to <b>teach</b> within the boundaries of a single discipline	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(e) I prefer to conduct <b>research</b> within the boundaries of a single discipline	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If you wish to elaborate on any of the points outlines above please do so in the space provided below and if necessary on the back of this sheet. If your response is directly relevant to one of the statements above please use the statement letter ie (a) or (b) etc, to identify it

## Section B Part 2

(a) Have you read the course document for the BSc in Product Design?

- yes
- no

(b) Is it necessary to have read the course document in order to deliver your module on the program

- yes
- no

(c) Are you clear on the role of all the various modules that constitute the program.

- very clear
- clear
- Undecided
- not very clear
- not at all clear

(d) Are you familiar with the course structure if the BSc in product design?

- very familiar
- familiar
- Undecided
- not very familiar
- not at all familiar

(e) Do you deliver your syllabus strictly in accordance with the outline in the course document?

- strictly in accordance
- somewhat in accordance
- Undecided
- occasionally in accordance
- not at all in accordance

(f) How important is it for you to have an overall picture of the module structure for the BSc in Product Design?

- very important
- important
- Undecided
- not important
- not important at all

**If you wish to elaborate on any of the points outlines above please do so in the space provided below and if necessary on the back of this sheet.** If your response is directly relevant to one of the statements above please use the statement letter ie (a) or (b) etc, to identify it

### Section B Part 3

The statements below aim to determine staff opinions on the curriculum as it relates to the BSc in Product Design

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
(a) I have contributed to the development of the <b>curriculum</b> for the BSc in Product Design	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(b) The curriculum has comprehensively <b>integrated</b> the various disciplines which contribute to the BSc in Product Design	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(c) Students can <b>identify</b> clearly the way the curriculum integrates the various disciplines which contribute to the BSc in Product Design	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(d) We should have more <b>opportunities to discuss</b> and develop the curriculum for the BSc in Product Design.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Please elaborate on your answer to (d) above:					
(e) The major emphasis on the BSc in Product design is on Engineering	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(f) The major emphasis on the BSc in Product design is on Design	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(g) The major emphasis on the BSc in Product design is on Business	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(h) The balance between disciplines on the BSc in product design is right at present.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Please elaborate on your answer to (h)					

**If you wish to elaborate on any of the points outlines above please do so in the space provided below and if necessary on the back of this sheet.** If your response is directly relevant to one of the statements above please use the statement letter ie (a) or (b) etc, to identify it



**Section B Part 4**

<p>(a) What are the major Barriers to the development of the BSc in Product Design?</p>
<p>(b) How could improvement be made to the BSc in Product Design?</p>
<p>(b) What are the major strengths of the BSc. In Product Design?</p>

## Section C

(a) How long have you been teaching within the Higher Education Sector _____ years					
(b) Did you teach on other higher education programs prior to your involvement in the BSc in Product Design. Yes <input type="checkbox"/> No <input type="checkbox"/> If yes please give details:					
	Strongly Disagree	Disagree somewhat	Uncertain	Agree somewhat	Strongly Agree
(c) The nature of my teaching has changed as a consequence of my involvement in the BSc in Product Design?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(d) Have you undertaken any form of <b>continuing professional development</b> over the past 5 years. Yes <input type="checkbox"/> No <input type="checkbox"/>					
(e) If 'Yes' to question (d).. Was this <b>continuing professional</b> development focussed on your Discipline Area? <input type="checkbox"/> If 'other' please outline Teaching? <input type="checkbox"/> Other? <input type="checkbox"/>					
(f) Have you undertaken any 'training' or 'studies' which focussed on your ' <b>teaching practice</b> ' (ie 'MA in Higher Education') Yes <input type="checkbox"/> No <input type="checkbox"/>					
(g) If 'Yes' to question (f).. Do you feel this helped with developing your <b>professional identity</b> as an academic? <input type="checkbox"/> helped a lot <input type="checkbox"/> helped somewhat <input type="checkbox"/> Undecided <input type="checkbox"/> helped very little <input type="checkbox"/> did not help at all					
(h) If 'No' to question (f).. Do you feel that undertaking further study in the area of <b>teaching practice</b> would contribute to the development of professional identity as an academic? <input type="checkbox"/> contribute a lot <input type="checkbox"/> contribute somewhat <input type="checkbox"/> Undecided <input type="checkbox"/> contribute very little <input type="checkbox"/> would not contribute at all					

## Section D

### APPROACHES TO TEACHING INVENTORY

*This inventory is designed to explore the way that academics go about teaching in a specific context or subject or course. This may mean that your response to these items in one context may be different to the responses you might make on your teaching in other contexts or subject. For this reason we ask you to describe your context. (Trigwell & Prosser)*

*Please describe the subject/year of your response here:*

*I.e. Professional Practice Year 4*

*Please answer each item. Do not spend a long time on each: your first reaction is probably the best one. Tick one box only.*

	Only Rarely true	Sometimes true	About half the time	Frequently true	Always true
1. I design my teaching in this subject with the assumption that most of the students have very little useful knowledge of the topics covered	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. I feel it is important that this subject should be completely described in terms of specific objectives relating to what students have to know for formal assessment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. In my interactions with students in this subject I try to develop a conversation with them about the topics we are studying	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I feel it is important to present a lot of facts to students so that they know what they have to learn for this subject	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I feel that the assessment in this subject should be an opportunity for the students to reveal their changed conceptual understanding of the subject	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. I set aside some teaching time so that the students can discuss, among themselves, the difficulties that they encounter studying this subject	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. In this subject I concentrate on covering the information that might be available from a good textbook	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. I encourage students to restructure their existing knowledge in terms of the new way of thinking about the subject that they will develop	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. In teaching sessions for this subject, I use difficult or undefined examples to provoke debate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. I structure this subject to help students to pass the formal assessment items	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. I think an important reason for running teaching sessions in this subject is to give students a good set of notes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. In this subject, I only provide the students with the information they will need to pass the formal assessment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. I feel that I should know the answer to any questions that students may put to me during this subject	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. I make available opportunities for students in this subject to discuss their changing understanding of the subject	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. I feel that it is better for students in this subject to generate their own notes rather than always copy mine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. I feel a lot of teaching time in this subject should be used to question students' ideas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Section E

The statements below aim to determine staff familiarity with the structure of the BSc in Product Design

Tick 1 box in each category which suggests what you believe represents the appropriate quality of a good **product designer**. An alternative choice is proposed if you cannot make a choice from the primary list

- Visual, focusing on images and symbols**  
 **Verbal, focusing on words and language**  
*Neither*   
*Both*

- Analytical**  
 **Intuitive**  
*Neither*   
*Both*

- Process ideas simultaneously**  
 **Process ideas sequentially**  
*Neither*   
*Both*

- Make logical deductions**  
 **Make lateral connections**  
*Neither*   
*Both*

- Organised**  
 **Disorganised**  
*Neither*   
*Both*

- Follows rules**  
 **Questions rules**  
*Neither*   
*Both*

- Knowing**  
 **Believing**  
*Neither*   
*Both*

- Safe**  
 **Risk Taker**  
*Neither*   
*Both*

Thank you for your participation and candid responses,  
Yours,

Robert Tully.  
(086-8248703, Robert.tully@dit.ie, rtully@indigo.ie)

## APPENDIX C – Questionnaire[b] Reference Codes

This document contains the complete set of reference codes linked to the questions as used in the research analysis. The First section of code refers to the question number (101-2 = question 1), the second code refers to the page number (101-2 = question 1 page 2).

<b>Reference Code</b>	<b>Section A Part 1a</b> <i>This section sets out to provide some general context</i>
101-2	(a) Are you currently employed by or contracted to DIT
102-2	(a) Which of the following Colleges of the Dublin Institute of Technology are/were you employed by or contracted to.
103-2	(b) Which School of the Dublin Institute of Technology are/were you employed by or contracted to.
104-2	(c) Are you a member of any professional body or professional organisation which represents your discipline?
105-2	(d) List the professional bodies or professional organisations of which you are a member:
106-2	(e) Which of the following sentences is <u>most appropriate</u> to how you see yourself professionally: Tick the box beside the one that is most appropriate..
107-2	(f) Are you engaged in <b>research</b> linked to your discipline If Yes then please provide details if appropriate:
108-2	(g) Are you engaged in <b>consultancy</b> linked to your discipline If Yes then please provide details if appropriate:

<b>Reference Code</b>	<b>Section A Part 1b</b> <i>This section sets out to provide some general context</i>
109-3	(a) Please indicate which years you have taught on the BSc in Product Design at the Dublin Institute of Technology.
110-3	(b) Please list the subjects which you teach/taught on the BSc in Product Design at the Dublin Institute of Technology. Also list the year group to which you teach/taught each subject:
111-3	(c) If you have taught for more than 2 academic years on the BSc in Product Design, what, in your opinion are the main changes that have occurred in that time?
112-3	(d) Please indicate what you believe is the current % of involvement of 'colleges' (Faculties) on the BSc in Product Design. Also indicate what percentage you feel would be appropriate to improve the program.

<b>Reference Code</b>	<b>Section A Part 1c</b> <i>This section sets out to determine if staff on the program have specific experience of product design.</i>
113-4	(a) Have you worked in industry as a product designer? If Yes then please provide details:
114-4	(b) If your answer to both (a) and (b) is No then have you worked in industry in collaboration with product designers or product engineers If Yes then please provide details:
115-4	(c) Have you studied for a formal design qualification at either degree or post graduate level:

	(If Yes then please provide details)
116-4	(d) Have you studied for a formal engineering qualification at either degree or post graduate level: (If Yes then please provide details)

<b>Reference Code</b>	<b>Section A Part 2</b> <i>Culture of Collaboration</i> <i>These questions seek to determine the breadth of experience of Staff across other programs at DIT</i>
117-5	(a) Do you teach or have you taught on the BSc in Product Design If your answer is No please indicated your relationship to the program:
118-5	(b) Are you involved in the management of the program If your answer is Yes please indicated your involvement in the program: ( <i>year co-ordinator, etc</i> )
119-5	(c) Do you teach on any program other than the BSc in Product Design in your department:
120-5	(d) Do you teach on any program outside your department but within your school?
121-5	(e) Do you teach on any other program outside your school
122-5	(f) Do you teach on any other multi-disciplinary programs
123-5	(g) Have you undertaken collaborative activity with colleagues from other schools or departments on the BSc in product design?
124-5	(h) If your answer to (g) was yes, provide an outline of the type of collaboration undertaken and an indication of whether you found it positive or negative:

<b>Reference Code</b>	<b>Section A Part 3</b> <i>Structure of collaboration</i> <i>These questions seek to determine the structure of multi-disciplinary activity within the colleges</i>
125-6	(a) The structure of the program is conducive to collaborative active
126-6	(b) Collaboration between disciplines is a positive characteristic of the BSc in Product Design.
127-6	(c) Increased contact between staff from different disciplines would improve collaboration on the program.
128-6	(d) In general <b>students</b> of the BSc in Product Design understand the rationale behind the collaboration between schools on this program
129-6	(e) In general <b>staff</b> of the BSc in Product Design understand the rationale behind the collaboration between schools on this program
130-6	(f) The structure of the BSc in Product Design is appropriate to the needs of the programme.
131-6	(g) The synergies between the schools are natural and appropriate for the delivery of a BSc in product design.
132-6	(h) I understand the relationship between the various modules over the 4 years of the program.
133-6	(i) The current balance of subjects is appropriate to the development of a product designer
134-6	(j) There is adequate contact between the different disciplines on the BSc in Product Design
135-6	(k) I am aware of the <b>teaching</b> methods used in other areas?
136-6	(l) I am aware of the <b>assessment</b> methods used in other areas?
137-6	(m) The management style in the organisation is characterised by teamwork, consensus and participation.

<b>Reference Code</b>	<b>Section A Part 4</b> <i>Culture of disciplines</i>
138-7	(a) <b>Disciplines</b> within higher education institutes have distinct cultures.
139-7	(b) <b>Departments</b> within higher education institutes have distinct cultures.
140-7	(c) <b>Schools</b> within higher education institutes have distinct cultures.
141-7	(d) Cooperation between disciplines is affected by the nature of their disciplinary cultures:
142-7	(e) How would you describe the discipline differences between your school and the two other schools contributing to the programme:
143-7	(f) There should be more focus on collaboration between discipline areas to create new synergies
144-7	(g) A barrier to collaboration on the BSc in Product Design are the prevailing institutional structures
145-7	(h) Collaboration offers new opportunity to develop the program.
146-7	(i) The program would develop more effectively without constructing collaborations.

<b>Reference Code</b>	<b>Section A Part 5</b> <i>Culture of disciplines</i>
147-8	(a) There should be more focus on the <b>strength</b> of disciplines and less on collaboration between them.
148-8	(b) There should be more focus on <b>collaboration</b> between discipline areas to create new synergies
149-8	(c) There is adequate contact between the different disciplines on the BSc in Product Design
150-8	(d) There should be more focus on the <b>engineering</b> content of the BSc in Product Design
151-8	(e) There should be more focus on the <b>creative design</b> content of the BSc in product design
152-8	(f) There should be more focus on the <b>business</b> content of the BSc in Product Design
153-8	(g) The separate campus locations for delivery of the BSc in Product Design is a positive experience for students
154-8	(h) Your own experience of being a student in Higher Education has informed your view of discipline identity
155-8	(i) The separate campus locations for delivery of the BSc in Product Design facilitate the students in experiencing the diversity of disciplines on location.
156-8	(j) It is important for students in Higher Education to identify with a particular academic culture
157-8	(k) There are considerable differences in how arts, engineering, and business address the teaching and assessment of academic content.
158-8	(l) It is important for all staff delivering on a program like the BSc in Product design to be aware of the teaching and assessment methods used by other disciplines.
159-8	(m) Students are aware of the differences between the discipline cultures that exist in the program
160-8	(n) Course leaders should construct the modules and direct staff to collaborate as appropriate (top Down)
161-8	(o) Module lecturers should seek to generate synergies between disciplines as they see appropriate and construct new module content (bottom up)

<b>Reference Code</b>	<b>Section A Part 6</b> <i>Culture of disciplines</i>
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162-9	(a) All disciplines should teach in a similar way in higher education
163-9	(b) All assessment methods should be similar in higher education.
164-9	(c) A mix of teaching and assessment methods enhances the breadth of the programme

<b>Reference Code</b>	<b>Section A Part 7</b> <i>These statements set out to determine how staff involved in the BSc in product design perceive their subject and discipline in the general context of academic knowledge</i>
165-10	(a) My discipline area is well defined
166-10	(b) My discipline area must be protected and defended
167-10	(c) I associate my academic discipline with an external professional discipline
168-10	(d) There is a clear perception of my discipline externally
169-10	(e) My subject specialism is well defined
170-10	(f) The boundaries of my subject specialism are flexible
171-10	(g) Discipline knowledge is the most legitimate form of knowledge
172-10	(h) My discipline area has a very clear approach to how it should be <b>taught</b>
173-10	(i) My discipline area has a very clear approach to how it should be <b>assessed</b>
174-10	(j) My discipline area can accommodate different ways of teaching and assessment
175-10	(k) My discipline uses very different teaching and assessment methods to other disciplines on the BSc in product design
176-10	(l) Different teaching and assessment methods on the BSc in product design confuse the students

<b>Reference Code</b>	<b>Section A Part 8</b> <i>Aim to determine staff opinions on interdisciplinary activity as a general aspect of academic culture</i>
177-11	(a) The interdisciplinary approach lacks disciplinary rigour
178-11	(b) Engaging in interdisciplinary work may lead to academics becoming 'jack of all trades and master of none'.
179-11	(c) An interdisciplinary approach contributes to the growth of knowledge
180-11	(d) Working across discipline boundaries improves teaching practice
181-11	(e) Real world issues and problems should be the focus of educational activity
182-11	(f) Many problems and/or issues cannot be defined or understood by a single discipline and require an interdisciplinary approach.
183-11	(g) Interdisciplinary studies at undergraduate level will weaken the knowledge base of established disciplines

<b>Reference Code</b>	<b>Section B Part 1</b> <i>The statements below aim to determine staff opinions on interdisciplinary activity in relation to the student context</i>
184-12	(a) The advance of specialisation has rendered many disciplines too complex for undergraduate study
185-12	(b) Discipline specialisation would be best placed at post graduate level in order to provide an interdisciplinary base to a student's overall study



186-12	(c) Students must first reach a deep understanding and knowledge of disciplines before they can tackle study across disciplines
187-12	(d) I prefer to <b>teach</b> within the boundaries of a single discipline
188-12	(e) I prefer to conduct <b>research</b> within the boundaries of a single discipline

<b>Reference Code</b>	<b>Section B Part 2</b>
189-13	(a) Have you read the course document for the BSc in Product Design?
190-13	(b) Is it necessary to have read the course document in order to deliver your module on the program
191-13	(c) Are you clear on the role of all the various modules that constitute the program.
192-13	(d) Are you familiar with the course structure if the BSc in product design?
193-13	(e) Do you deliver your syllabus strictly in accordance with the outline in the course document?
194-13	(f) How important is it for you to have an overall picture of the module structure for the BSc in Product Design?

<b>Reference Code</b>	<b>Section B Part 3</b> <i>The statements below aim to determine staff opinions on the curriculum as it relates to the BSc in Product Design</i>
195-14	(a) I have contributed to the development of the <b>curriculum</b> for the BSc in Product Design
196-14	(b) The curriculum has comprehensively <b>integrated</b> the various disciplines which contribute to the BSc in Product Design
197-14	(c) Students can <b>identify</b> clearly the way the curriculum integrates the various disciplines which contribute to the BSc in Product Design
198-14	(d) We should have more <b>opportunities to discuss</b> and develop the curriculum for the BSc in Product Design.
199-14	(e) The major emphasis on the BSc in Product design is on Engineering
200-14	(f) The major emphasis on the BSc in Product design is on Design
201-14	(g) The major emphasis on the BSc in Product design is on Business
202-14	(h) The balance between disciplines on the BSc in product design is right at present.

<b>Reference Code</b>	<b>Section B Part 4</b>
203-15	(a) What are the major Barriers to the development of the BSc in Product Design?
204-15	(b) How could improvement be made to the BSc in Product Design?
205-15	(c) What are the major strengths of the BSc. In Product Design?

<b>Reference Code</b>	<b>Section C</b>
206-16	(a) How long have you been teaching within the Higher Education Sector

207-16	(b) Did you teach on other higher education programs prior to your involvement in the BSc in Product Design. If yes please give details:
208-16	(c) The nature of my teaching has changed as a consequence of my involvement in the BSc in Product Design?
209-16	(d) Have you undertaken any form of <b>continuing professional development</b> over the past 5 years.
210-16	(e) If 'Yes' to question (d).. Was this <b>continuing professional</b> development focussed on
211-16	(f) Have you undertaken any 'training' or 'studies' which focussed on your ' <b>teaching practice</b> ' (ie 'MA in Higher Education')
212-16	(g) If 'Yes' to question (f).. Do you feel this helped with developing your <b>professional identity</b> as an academic?
213-16	(h) If 'No' to question (f).. Do you feel that undertaking further study in the area of <b>teaching practice</b> would contribute to the development of professional identity as an academic?

<b>Reference Code</b>	<b>Section D APPROACHES TO TEACHING INVENTORY</b>
214-17	<i>Please describe the subject/year of your response here:</i>
215-17	17. I design my teaching in this subject with the assumption that most of the students have very little useful knowledge of the topics covered
216-17	18. I feel it is important that this subject should be completely described in terms of specific objectives relating to what students have to know for formal assessment
217-17	19. In my interactions with students in this subject I try to develop a conversation with them about the topics we are studying
218-17	20. I feel it is important to present a lot of facts to students so that they know what they have to learn for this subject
219-17	21. I feel that the assessment in this subject should be an opportunity for the students to reveal their changed conceptual understanding of the subject
220-17	22. I set aside some teaching time so that the students can discuss, among themselves, the difficulties that they encounter studying this subject
221-17	23. In this subject I concentrate on covering the information that might be available from a good textbook
222-17	24. I encourage students to restructure their existing knowledge in terms of the new way of thinking about the subject that they will develop
223-17	25. In teaching sessions for this subject, I use difficult or undefined examples to provoke debate
224-17	26. I structure this subject to help students to pass the formal assessment items
225-17	27. I think an important reason for running teaching sessions in this subject is to give students a good set of notes
226-17	28. In this subject, I only provide the students with the information they will need to pass the formal assessment
227-17	29. I feel that I should know the answer to any questions that students may put to me during this subject
228-17	30. I make available opportunities for students in this subject to discuss their changing understanding of the subject
229-17	31. I feel that it is better for students in this subject to generate their own notes rather than

	always copy mine
230-17	32. I feel a lot of teaching time in this subject should be used to question students' ideas.

<b>Reference Code</b>	<b>Section E</b> <i>The statements below aim to determine staff familiarity with the structure of the BSc in Product Design</i>
231-18	Tick 1 box in each category which suggests what you believe represents the appropriate quality of a good <b>product designer</b> . An alternative choice is proposed if you cannot make a choice from the primary list.

## APPENDIX D. Data Analysis - Input Framework

Example of data input from Master Data Analysis Document

Participant Code	Sort Code	INPUT 7 189-13 to 194-13 Data Set	B 2 (a)		B 2 (b)		B 2 (c)					B 2 (d)					B 2 (e)					B 2 (f)				
			189-13		190-13		191-13					192-13					193-13					194-13				
			1	2	1	2	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
103A	A			1					1					1						1				1		
105A	A		1			1				1					1						1				1	
111A	A		1			1				1				1							1				1	
114A	A																									
143A	A																									
144A	A																									
146A	A		1			1				1				1						1				1		
149A	A			1			1			1				1						1				1		
154A	A			1			1			1				1						1				1		
157A	A		1			1				1				1						1				1		
160A	A		1			1				1				1						1				1		
161A	A			1		1				1				1						1				1		
108B	B																									
109B	B		1			1				1				1						1				1		
112B	B		1			1				1				1						1				1		
113B	B																									
116B	B																									
121B	B																									
123B	B																									
129B	B																									
130B	B		1			1				1				1						1				1		
131B	B																									
134B	B		1			1				1				1						1				1		
136B	B			1		1				1				1						1				1		
141B	B		1			1				1				1						1				1		
148B	B																									
150B	B																									
151B	B																									
158B	B																									
101E	E																									
102E	E																									
104E	E																									
106E	E		1			1				1				1						1				1		
107E	E																									
110E	E		1							1				1						1				1		
115E	E					1				1				1						1				1		
117E	E																									
118E	E																									
119E	E																									
120E	E																									
122E	E																									
124E	E		1			1				1				1						1				1		
125E	E																									
126E	E																									
127E	E																									
128E	E		1			1				1				1						1				1		
132E	E																									
133E	E			1			1			1				1						1				1		
135E	E																									
137E	E																									
138E	E																									
139E	E																									
140E	E		1			1				1				1						1				1		
142E	E																									
145E	E		1			1				1				1						1				1		
147E	E		1			1				1				1						1				1		
152E	E																									
153E	E		1			1				1				1						1				1		
155E	E																									
156E	E																									
159E	E																									
162E	E																									

## APPENDIX E - Data Analysis Framework

Example of Data Analysis Spreadsheet from Master Data Analysis Document

Questionnaire Reference Code:	194-13				
<b>Section 1 - Total Summary</b>					
Data:	1	2	3	4	5
Number of respondents to category	11	13	1	0	0
Percentage responses to question	44%	52%	4%	0%	0%
Bi-polar Response Summary		96%		0%	
Standard Deviation	6.442049363				
Population Standard Deviation	5.761944116				
Mean (Average)	5				
Variance	41.5				
Total Number of respondents	25				
<b>Section 2 - Arts Summary</b>					
Data:	1	2	3	4	5
Number of respondents to category	6	3	0	0	0
Percentage responses to question	67%	33%	0%	0%	0%
Bi-polar Response Summary		100%		0%	
Standard Deviation	2.683281573				
Population Standard Deviation	2.4				
Mean (Average)	1.8				
Variance	7.2				
Total Number of respondents	9				
<b>Section 3 - Business Summary</b>					
Data:	1	2	3	4	5
Number of respondents to category	1	4	1	0	0
Percentage responses to question	17%	67%	17%	0%	0%
Bi-polar Response Summary		83%		0%	
Standard Deviation	1.643167673				
Population Standard Deviation	1.469693846				
Mean (Average)	1.2				
Variance	2.7				
Total Number of respondents	6				
<b>Section 4 - Engineering Summary</b>					
Data:	1	2	3	4	5
Number of respondents to category	4	6	0	0	0
Percentage responses to question	40%	60%	0%	0%	0%
Bi-polar Response Summary		100%		0%	
Standard Deviation	2.828427125				
Population Standard Deviation	2.529822128				
Mean (Average)	2				
Variance	8				
Total Number of respondents	10				
Questionnaire Reference Code:	194-13				
How important is it for you to have an overall picture of the module structure for the BSc in Product Design?					
Observation: Notes					
<p>[194-13] 96% of respondents indicated that it is important or very important to have an overall picture of the module structure for the BSc in Product Design. The discipline differences that emerge are not hugely significant but do emerge. All Engineering and Arts respondents acknowledge the importance of having an overall picture of the module structure but only 83% of Business respondents indicated this to be the case. However, perhaps of more significance is that when asked if they were clear on the role of the various modules that constitute the program that only 17% of Business respondents were clear. This suggests a huge gap between the what is recognised as appropriate and necessary and what is the actual situation. While Business demonstrates the extreme in some respects, both Arts and Engineering also leave a considerable gap between theory and practice regarding this issue.</p>					

## APPENDIX F - Literature Review Analysis Framework Sample

Doc. Ref Refer/Bib	Code A - Major Category	Code B - Minor Category	Code C - Thesis Context with Chapter Reference	Citation	Journals Cited	Significance			Observations regarding the Reference	
						A - Seminal	B - High	C - Medium		D - Low
D1	R	Academic Identities	Professional Discipline	Literature Review	Jawitz, Jeff, (2009), Academic identities and communities of practice in a professional discipline, Teaching in Higher Education, Vol. 14, No. 3, pp 241-251	Teaching in Higher Education		B		This paper looks at the dynamics around the formation of academic identities
	R	Academic Socialisation	Learning Theory	Literature Review	Jawitz, Jeff, (2009), Learning in the academic workplace: the harmonisation of the collective and the individual habitus, Studies in Higher Education, Vol. 34, No. 6, pp 601-614	Studies in Higher Education		C		Jawitz (2009), in pursuit of an understanding of how academics learn, explores both Bourdieu's social practice theory and Lave & Wenger's situated learning theory to interrogate the way "learning of practice" is constructed within the academic workplace. Jawitz (2009, p 613) argues that there is a requirement to "focus on supporting relationships within communities of practice that encourage the sharing of understandings and negotiations around the distributed knowledge of practice" and to facilitate the harmonisation of both individual and collective "habitus" in department communities of practice. Eraut (2004, p248) suggests that a great deal of the learning which occurs in the workplace consists of informal learning experiences comprising both "learning from other people and learning from personal experience".
	B	Discipline Identity	Personal Epistemologies	Literature Review	Jehng, J.C., Johnson, S.D., & Anderson, R.C., (1993), Schooling and students' epistemological beliefs about learning, Contemporary Educational Psychology, Vol. 18, pp 23-35	Contemporary Educational Psychology			D	
	B	Discipline		Literature Review	Jenkins A. (1996), "Discipline-based education development", International Journal of Academic Development, Vol. 1 pp.50 - 62.	International Journal of Academic Development				
	B	Faculty Cultures	Interdisciplinary Education	Literature Review	Jerry G. Gaff and Robert C. Wilson, (1971), Faculty Cultures and Interdisciplinary Studies The Journal of Higher Education, Vol. 42, No. 3 (Mar., 1971), pp. 186-201 (article consists of 16 pages) Published by: Ohio State University Press Stable URL: <a href="http://www.jstor.org/stable/1980354">http://www.jstor.org/stable/1980354</a>	The Journal of Higher Education				
	R	Constructivist Pedagogy	Knowledge Production	Literature Review	Johnson, D. W., & Johnson, R. T. (1994). Learning together and alone: Cooperative, competitive, and individualistic learning (4th ed.). Boston, MA: Allyn and Bacon.	Book			D	
	R	Collaboration		Literature Review	John-Steiner, V., Weber, R. J., and Minnis, M. (1998), "The Challenge of Studying Collaboration." American Educational Research Journal, 35(4), 773-783.	American Educational Research Journal				
	R	Disciplinary	Discipline Orientated	Literature Review	Jones, A., (2009), Redisciplining generic attributes: the disciplinary context in focus, Studies in Higher Education, Vol. 34, No. 1, pp 85-100	Studies in Higher Education		B		Jones (2009, p85) argues that disciplinary context is very important in the construction of "generic skills and attributes" and that generic skills like problem solving, critical thinking and communications do not transcend disciplines. Jones (2009) draws on a literature exploring generic skills (Barnett, 1994; Barrie, 2006; Marginson, 1994) as well as the literature on disciplinary cultures (Becher, 1989; Becher & Trowler, 2001; Biglab, 1973; Donald, 2002, Lattuca & Stark, 1995, Yljoki, 2000) to suggest that not alone are generic attributes very context dependent, but are also informed by the disciplinary epistemology in which they are conceptualised and taught. (Jones, 2009, p 86)
D3	R	Culture of Design		Literature Review	Juler, G., From Visual Culture to Design Culture, (2006) Design Issues, Winter 2006, Vol. 22, No. 1, Pages 64-76), The MIT Press	Design Issues				
D4	R	Interdisciplinary Education		Literature Review	Kahin, B., 2002-08-28 "Codification in Context: Infrastructure and Policy for the Knowledge Economy" Paper presented at the annual meeting of the American Political Science Association, Boston Marriott Copley Place, Sheraton Boston & Hynes Convention Center, Boston, Massachusetts Online <PDF>. 2009-05-26 from <a href="http://www.allacademic.com/meta/p66303_index.html">http://www.allacademic.com/meta/p66303_index.html</a>					
	R	Collaboration		Literature Review	Kanter, R.M., (1994) Collaborative advantage: the art of alliances. Harvard Business Review, Vol. 4, pp96-108	Harvard Business Review		C		Focus on the strategic benefit of collaboration. Cited in: Kezar, A. (2005). Redesigning for Collaboration within Higher Education Institutions: An Exploration into the Developmental Process, Research in Higher Education, Vol. 46, No. 7, pp 831-860
	R	Discipline Identity	Undergraduate	Literature Review	Kapp, R., & bangan, B., (2010), Positioning (in) the discipline: undergraduate students' negotiations of disciplinary discourses, Teaching in Higher Education, Vol. 14, No. 6, pp 587-596	Teaching in Higher Education		C		Discourse on evolving identities for students in HE related to their disciplines
	R	Interdisciplinarity	Beyond Disciplines	Literature Review	Karkqvist, A. (1999) Going beyond disciplines: the meanings of interdisciplinarity, Policy Sciences, 32(4), 379-383.	Policy Sciences				
	R	Academic Freedom		Literature Review	Karran, T., (2009), Academic Freedom: in justification of a universal ideal, Studies in Higher Education, Vol. 34, No. 3, pp 263-283	Studies in Higher Education		C		Focus on the importance of Academic Freedom at the heart of what a University is. Karran, (2009, p264) indicates that the importance of academic freedom was recognised at the conception of the European University system in the 11th and 12th centuries and remains a central defining characteristic. The Magna Charta Universitatum outlines that "Freedom in research and training is the fundamental principle of university life, and governments and universities, each as far as in them lies, must ensure respect for this fundamental requirement", (European Universities Association, 1988, p1)
	R	Constructivist Pedagogy		Literature Review	Kaufman, D. (1996). Constructivist-based experiential learning in teacher education. Action in Teacher Education, Vol. 18, No. 2, pp 40-49.	Action in Teacher Education		C		
	B	Discipline	Academic Leadership	Literature Review	Kekale, J. (1999) Preferred Patterns of Academic Leadership in Different Disciplinary (Sub)cultures. Higher Education, 37, 217-238.	Higher Education				
	B	Discipline	Quality	Literature Review	Kekale, J. (2002) Conceptions of Quality in Four Different Disciplines. Tertiary Education and Management, 8, 65-80.	Tertiary Education and Management				

## APPENDIX G - Literature Review – Coded Analysis Sample

Academic Identities		Literature Review	Henkel M. (2000), Academic identities and policy change in higher education, Higher Education policy 46.
Academic Career	Challenges	Literature Review	Pienaar, C., and Bester, C., (2005), Addressing career obstacles within a changing higher education work environment: perspectives of academics, South African Journal of Psychology, Vol. 39, No. 4, pp376-385.
Academic Career	Challenges	Literature Review	Salmi, J. (2000), Tertiary Education in the twenty-first Century: Challenges and opportunities, Paper presented at the IMHE General Conference, September, Paris: France
Academic Career	Challenges	Literature Review	Zaharia, S., (2002), A comparative Overview of Some Fundamental Aspects of University management as Practiced in Several European Countries. Higher Education in Europe, Vol. 27. pp 301-311
Academic Conflict		Literature Review	Ladd, E.C., and Lipset, S.M., (1975). The Divided Academy: Professors and Politics. Berkeley, CA: Carnegie Commission on Higher Education.
Academic Culture		Literature Review	Austin, Ann E., (1990), Faculty Cultures, Faculty Values. New Directions for Institutional Research, (No. 68 Assessing Academic Climates and Cultures) v17 n4 p61-74 Win 1990
Academic Culture		Literature Review	Austin, Ann E., (1994), Understanding and assessing faculty cultures and climates, New Directions for Institutional Research, Issue 84, Pages 47 – 63
Academic Culture	Academic Identity	Literature Review	Clark, B.R. (1963), Faculty Cultures, in T.F. Lunsford (ed.) The Study of campus Cultures. Western Interstate Commission for Higher Education. Boulder, Colorado. Pp 39-54
Academic Culture	Academic Identity	Literature Review	Clark, B.R. (1970), The Distinctive College: Reed, Antioch and Swarthmore. Chicago, Aldine.
Academic Culture	Engineering Emphasis	Literature Review	Godfrey, E., Parker, L., Mapping the Cultural Landscape in Engineering Education, Journal of Engineering Education, Jan 2010
Academic Culture	Research	Literature Review	Holligan, C., (2011), Feudalism and academia: UK academics accounts of research culture. International Journal of Qualitative Studies in Education, Vol. 24, No. 1, pp 55-75
Academic Culture	Department	Literature Review	Knight, P. & Trowler, P. (2000) Department-level cultures and the improvement of learning and teaching. Studies in Higher Education. 25,1, 69-83.ISSN: 0307-5079.
Academic Culture		Literature Review	Kogan, M., (1999), The Culture of Academ (review of P.A.M. Maassen, Governmental Steering and the Academic Culture), Minerva, Vol. 37, pp 63-74
Academic Culture		Literature Review	Maassen, P., (1996), The concept of culture and higher education, Tertiary Education and Management, Volume 2, Number 2
Academic Culture	Research	Literature Review	Peterson, M. W.; Spencer, M G. (1990), Understanding Academic Culture and Climate. New Directions for Institutional Research, (No. 68 Assessing Academic Climates and Cultures) v17 n4 p3-18 Win 1990

Academic Culture		Literature Review	Silver, H., (2003), Does a University have a Culture?, Studies in Higher Education, Vol. 28, No. 2, pp 157-169
Academic Culture		Literature Review	Snow, C.P. (1959), The two Cultures and the Scientific Revolution. Cambridge, Cambridge University Press
Academic Culture		Literature Review	Snow, C.P. (1964), The two Cultures: A Second Look, an expanded version of The two Cultures and the Scientific Revolution . Cambridge, Cambridge University Press
Academic Culture	Frameworks	Literature Review	Trowler, P. (1998) Academics Responding to Change: new higher education frameworks and academic cultures. Buckingham: Open University Press/SRHE.
Academic Cultures		Literature Review	Geertz, C. (1993) The Interpretations of Cultures, Basic Books, New York.
Academic Cultures	Changing Policy	Literature Review	McNay, I. (1995), From the collegial academy to the corporate enterprise: the changing cultures of the universities, in T. Schuller (Ed.) The Changing University?, Buckingham, Open University Press
Academic Departments	Learning in Academic Departments	Literature Review	Ramsden, P., (2004)The Context of Learning in Academic Departments, In F. Marton, D. Hounsell & N. Entwistle (Eds) The Experience of Learning, pp.198-216. Edinburgh: Scottish Academic Press.
Academic Development	Professional Development	Literature Review	Crittendon, B., (1997), Minding their business: The proper role of universities and some suggested reforms. Occasional Paper Series 2. Canberra: Academy of the Social Sciences in Australia.
Academic Development	Professional Development	Literature Review	D'Andrea, V., & Gosling, D., (2005) Improving teaching and learning in Higher Education: A whole institution approach. Maidenhead, Open University Press.
Academic Development	Interdisciplinary Professional Development	Literature Review	Davidson, M. (2004) Bones of Contention: Using self and story in the quest to professionalise higher education teaching - an interdisciplinary approach. Teaching in Higher Education, Vol. 9, No. 3, pp299-310
Academic Development	Professional Identity	Literature Review	Harland, T., & Staniforthb, D., (2003) Academic Development as Academic Work, International Journal for Academic Development, Vol. 8, No. 1, pp 25-35
Academic Development	Collaborative Practice	Literature Review	Hart, G., (1997) Modelling a learning environment: Towards a learning organization. International Journal for Academic Development, Vol. 2, No. 2, pp 50-55
Academic Development		Literature Review	Perry, W. B. (1970). Forms of Intellectual and Ethical Development in the College Years: A Scheme. New York: Holt, Rinehart, and Winston.
Academic Development	Professional Development	Literature Review	Quinn, L., (2011), Understanding resistance: an analysis of discourses in academic staff development, Studies in Higher Education, iFirst, First published online, Downloaded 16/6/2011)
Academic Disciplines		Literature Review	Braxton, J. Hargens L. (1996), Variation among academic disciplines: analytical frameworks and research, In J. Smart (Eds),Agathon Press, San Francisco, pp.1 - 46.



Academic Disciplines	Personal Epistemologies	Literature Review	King, P.M., & Kitchener, K.S., (1994), Developing reflective judgements: Understanding and promoting intellectual growth and critical thinking in adolescents and adults. San Francisco: Jossey-Bass
Academic Disciplines		Literature Review	Kreber, C., (2009), Eds. The university and its disciplines: Teaching and learning within and beyond disciplinary boundaries. London, Routledge.
Academic Disciplines		Literature Review	Smart, J.C., Feldman, K.A., & Ethington, C.A., (2000), Academic Disciplines. Holland's Theory and the Study of College Students and faculty, 1st Edn., Nashville, TN, Vanderbilt University Press
Academic Discourse	Identity Formation	Literature Review	Bazerman, C., (1981) What written knowledge does: three examples of academic discourse, Philosophy of the Social Sciences, Vol 2, pp. 361-387
Academic Freedom		Literature Review	European Universities Association, (1988), Magna Charta Universitatum. Bologna: EUA.
Academic Freedom		Literature Review	Karran, T., (2009), Academic Freedom: in justification of a universal ideal, Studies in Higher Education, Vol. 34, No. 3, pp 263-283
Academic Identities		Literature Review	Adams, D. (1998) 'Examining the Fabric of Academic Life: An Analysis of Three Decades of Research on the Perceptions of Australian Academics about their Roles', Higher Education, Vol. 36, No. 4, pp 421-435.
Academic Identities		Literature Review	Bain, J. D., McNaught, C., Mills, C. and Lueckenhausen, G. (1998) Understanding CFL Practices in Higher Education in Terms of Academics' Educational Beliefs: enhancing Reeves' Analysis. Australasian Society for Computers in Learning in Tertiary Education.
Academic Identities		Literature Review	Barley, S.R. (1989), "Careers, identities, and institutions: the legacy of the Chicago School of Sociology", in Arthur, M.B., Hall, D.T., Lawrence, B.S. (Eds), Handbook of Career Theory, Cambridge University Press, Cambridge, pp.41-65.
Academic Identities		Literature Review	Barnett, R. (1999), Learning to work and working to learn. In Understanding learning at work. Ed., D.Boud and J. Garrick, pp29-44, New York, Routledge
Academic Identities		Literature Review	Barnett, R. (2003). Beyond All Reason: Living with Ideology in the University (Buckingham, SRHE and Open University Press).
Academic Identities		Literature Review	Barnett, R., & Di Napoli, R., Ed. (2008), Changing Identities in Higher Education - Voicing Perspectives, Routledge, London & New York
Academic Identities		Literature Review	Barnett, R., (2000), Realizing the University in an Age of Supercomplexity, Buckingham, Open University Press.
Academic Identities		Literature Review	Barry, J., Chandler, J. and Clark, H. (2001) 'Between the Ivory Tower and the Academic Assembly Line', Journal of Management Studies, Vol. 38, pp. 87-101.
Academic Identities	Academic Tribes	Literature Review	<b>Becher, T. &amp; Trowler P. R., (2001) Academic Tribes and Territories: Intellectual enquiry and the culture of disciplines, Cultures, Publisher: The Society for Research into Higher Education</b>

			<b>&amp; Open University Press, Pages: 33</b>
<b>Academic Identities</b>	<b>Academic Tribes</b>	<b>Literature Review</b>	<b>Becher, T. (1989), Academic Tribes and Territories: Intellectual Enquiry and the Cultures of Disciplines, SRHE and Open University Press, Buckingham,</b>
Academic Identities	Cultural Identity	Literature Review	Becker, H.S., Geer, B., Hughes, E.C. & Strauss, A.L., (1961), Boys in White: Student Culture in Medical School. Chicago: University of Chicago Press
Academic Identities	Cultural Identity	Literature Review	Becker, H.S., Geer, B., Hughes, E.C. (1968), making the Grade: The Academic Side of College Life. New York: John Wiley.
Academic Identities		Literature Review	Bledstein, B.J., (1976), The Culture of Professionalism: The Middle Class and the Development of Higher Education in America. New York: Norton
Academic Identities	Tribes	Literature Review	Boffo, S., and Roberto Moscati, R., (1998), Evaluation in the Italian Higher Education System: Many Tribes, Many Territories... Many Godfathers European Journal of Education, Vol. 33, No. 3, The Evaluative State Revisited: 20th Anniversary Issue of Review of Trends in Higher Education (Sep., 1998), pp. 349-360 (article consists of 12 pages) Published by: Blackwell Publishing Stable URL: <a href="http://www.jstor.org/stable/1503588">http://www.jstor.org/stable/1503588</a> .
Academic Identities	Social Role	Literature Review	Brennan, J. (2004). The Social Role of the Contemporary University: Contradictions, Boundaries and Change. Ten Years On: Changing Education in a Changing World, Centre for Higher Education Research and Information (CHERI). Buckingham: The Open University Press
Academic Identities		Literature Review	Burgan, M. (1998). Academic Citizenship: A Fading Vision. Liberal Education, Vol. 84, No. 4, p16-21.
Academic Identities	Social Forces	Literature Review	Burke, P.J., & Tully, J.C., (1977) The Measurement of Role Identity, Social Forces, Vol. 55, No. 4, pp. 881-897 (article consists of 17 pages) Published by: University of North Carolina Press, Stable URL: <a href="http://www.jstor.org/stable/2577560">http://www.jstor.org/stable/2577560</a> (Access on Jstor)
Academic Identities	Social Identities	Literature Review	Chesler, M., and Young, A.A., (2007), Faculty Members' Social Identities and Classroom Authority, New Directions for Teaching and Learning, No 111, p11-19
Academic Identities	Transition	Literature Review	Churchman, D., & King, S., (2009), Academic practice in transition: hidden stories of academic identities, Teaching in Higher Education, Vol. 14, No. 5, pp 507-516
Academic Identities		Literature Review	Clegg, S. (2007). Academic identity and intellectual enquiry – breaking the research/teaching dualism? Paper presented at the International Colloquium: International policies and practices for academic enquiry. Southampton Solent University, 19-21 April 2007.

## APPENDIX H - Journal Listings

The following journal were accessed in the process of interrogating a broad section of literature which address issues of relevance to this study.

1. AAHE Bulletin
2. About Campus
3. Academy of Management Executive
4. Academy of Management Journal
5. Action in Teacher Education
6. Active Learning in Higher Education
7. Adult Education
8. American Educational Research Journal
9. American Journal of Preventive Medicine
10. American Scholar
11. American Society for Engineering Education
12. American Sociological Review
13. American Journal of Pharmaceutical Education
14. Annual Review of Sociology
15. Architectural engineering and design management
16. Area
17. Art Bulletin
18. Art, Design & Communications in Higher Education
19. Arts Education Policy Review
20. ASHE Higher Education Report
21. Association for Integrative Studies Newsletter
22. British Educational Research Journal
23. British Journal of Educational Studies
24. British Journal of Sociology of Education
25. British Medical Journal
26. Bulletin of Science, Technology & Society
27. Cambridge Journal of Education
28. Campus
29. Centre for Studies in Higher Education
30. Change
31. Chronicle of Higher Education
32. Clin Invest Med
33. Cognition and Instruction,
34. College English
35. Communications Education
36. Conference
37. Contemporary Educational Psychology
38. CSHE Report
39. Cultural Anthropology
40. Design Issues
41. Design Management Journal
42. Discourse & Society
43. Discussion papers
44. Dissertation
45. Distance Education

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|---|--|
| 46. Ecological Economics                                      | 73. Industrial and Corporate Change                                      |
| 47. Ecology and Society                                       | 74. Information Research   |
| 48. Education Technology Research & Development               | 75. Innovation in Higher Education                                       |
| 49. Educational Action Research                               | 76. Innovation, Education and Communication for Sustainable Development, |
| 50. Educational Philosophy and Theory                         | 77. Innovations in Education and Teaching International                  |
| 51. Educational Psychologist                                  | 78. Innovative Higher Education  |
| 52. Educational Psychology in Practice                        | 79. Institute of Development Studies Bulletin                            |
| 53. Educational Research                                      | 80. Interdisciplinarity  |
| 54. ERIC Digest   | 81. Interdisciplinary Science Reviews                                    |
| 55. European Journal of Education                             | 82. International Higher Education                                       |
| 56. European Journal of Engineering Education                 | 83. International Journal for Academic Development                       |
| 57. European Journal of Information Systems                   | 84. International Journal for Educational and Vocational Guidance        |
| 58. Focus on Health Professional Education                    | 85. International Journal of Academic Development                        |
| 59. Futures   | 86. International Journal of Art & Design Education                      |
| 60. Geography in Higher Education                             | 87. International Journal of Educational Research                        |
| 61. Harvard Business Review                                   | 88. International Journal of Engineering Education                       |
| 62. Higher Education  | 89. International Journal of Inclusive Education                         |
| 63. Higher Education in Europe                                | 90. International Journal of Management Science (OMEGA)                  |
| 64. Higher Education Management and Policy                    | 91. International Journal of Qualitative Studies in Education            |
| 65. Higher Education Perspectives                             | 92. International Journal of Science Education                           |
| 66. Higher Education policy                                   | 93. International Journal of Sustainability in Higher Education          |
| 67. Higher Education Quarterly                                | 94. International Social Science Journal                                 |
| 68. Higher Education Research & Development                   |  |
| 69. History and Technology                                    |  |
| 70. Human Development   |  |
| 71. Identity: An International Journal of Theory and Research |  |
| 72. IEEE Transactions on Education                            |  |

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|------|--|------|--|
| 95.  | International Sociology                              | 122. | Journal of Teacher Education   |
| 96.  | International Studies in Higher Education            | 123. | Journal of the American Society for Information Science and Technology |
| 97.  | International Studies Review                         | 124. | Journal of Vocational Behaviour  |
| 98.  | Issues in Integrative Studies                        | 125. | Knowledge-based systems  |
| 99.  | JOAAG  | 126. | Language and Learning Across the Disciplines                           |
| 100. | Journal of Applied Behavioural Science               | 127. | Liberal Education  |
| 101. | Journal of Applied Psychology                        | 128. | London Review of Education   |
| 102. | Journal of Economic Perspectives                     | 129. | Management Science   |
| 103. | Journal of Education Policy                          | 130. | Marketing Bulletin   |
| 104. | Journal of Education Thought                         | 131. | Medical Teacher  |
| 105. | Journal of Educational Administration                | 132. | Minerva  |
| 106. | Journal of Educational Psychology                    | 133. | National Forum   |
| 107. | Journal of Engineering Education                     | 134. | New Directions for Child and Adolescent Development                    |
| 108. | Journal of Further and Higher Education              | 135. | New Directions for Community Colleges                                  |
| 109. | Journal of General Education                         | 136. | New Directions for Institutional Research                              |
| 110. | Journal of Geography in Higher Education             | 137. | New Directions for Teaching and Learning                               |
| 111. | Journal of Higher Education                          | 138. | New Statesman  |
| 112. | Journal of Higher Education Policy and management    | 139. | Occasional Papers  |
| 113. | Journal of Higher Education Research and Development | 140. | Online discussion paper  |
| 114. | Journal of Intercultural Communication research      | 141. | Online Journal   |
| 115. | Journal of Interprofessional Care                    | 142. | On-line Notes  |
| 116. | Journal of Law and Society                           | 143. | Organization Science   |
| 117. | Journal of Management Studies                        | 144. | Oxford review of Education   |
| 118. | Journal of Personality and Social Psychology         | 145. | Pedagogy, Culture & Society  |
| 119. | Journal of Philosophy of Education                   | 146. | Personnel Review   |
| 120. | Journal of research in Science Teaching              | 147. | Philosophy of Science  |
| 121. | Journal of Social Science Education                  | 148. | Philosophy of the Social Sciences                                      |

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| 149. | Planning for Higher Education                | 177. | Social Science and Medicine  |
| 150. | Poetics                                      | 178. | Society for Design and Process Science                             |
| 151. | Poetics Today                                | 179. | Sociology  |
| 152. | Policy Futures in Education                  | 180. | Sociology of Education   |
| 153. | Policy Sciences                              | 181. | Sociology of Health & Illness                                      |
| 154. | Power and Education                          | 182. | Soundings  |
| 155. | Public Opinion Quarterly                     | 183. | South African Journal of Psychology                                |
| 156. | Quality in Higher Education                  | 184. | Studies in Continuing Education                                    |
| 157. | Reflective Practice                          | 185. | Studies in Higher Education  |
| 158. | Report                                       | 186. | Symposium  |
| 159. | Research Evaluation                          | 187. | Systems Research and Behavioural Science                           |
| 160. | Research in Higher Education                 | 188. | Teachers College Record  |
| 161. | Research Papers                              | 189. | Teaching and Teacher Education                                     |
| 162. | Research Policy                              | 190. | Teaching Children Mathematics                                      |
| 163. | Rethinking Interdisciplinarity - Online      | 191. | Teaching in Higher Education                                       |
| 164. | Review of Educational Research               | 192. | Teaching Sociology   |
| 165. | Review of Higher Education                   | 193. | Technology, and Policy   |
| 166. | Scandinavian Journal of Educational Research | 194. | Tertiary Education and Management                                  |
| 167. | School Psychology Quarterly                  | 195. | The Academy of management Review                                   |
| 168. | Science and Public Policy                    | 196. | The American Journal of Occupational Therapy                       |
| 169. | Science Education                            | 197. | The Australian Educational Researcher                              |
| 170. | Science Studies                              | 198. | The Built and Human Environment Review                             |
| 171. | Science, Technology, and Society Newsletter  | 199. | The Curriculum Journal   |
| 172. | Social Analysis                              | 200. | The Information Society  |
| 173. | Social Anthropology                          | 201. | The International Journal for Academic Development                 |
| 174. | Social Cognition                             | 202. | The International review of research in Open and Distance Learning |
| 175. | Social Epistemology                          | 203. | The Journal of Higher Education                                    |
| 176. | Social Forces                                |      |  |

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|------|--------------------------------|------|--------------------------------------|
| 204. | The Qualitative Report         | 209. | Urban Education                      |
| 205. | The Review of Higher Education | 210. | Washington University Journal of Law |
| 206. | The Social Science Journal     | 211. | Working Papers                       |
| 207. | Theory into Practice           | 212. | Written Communication                |
| 208. | To Improve the Academy         |      |                                      |

## APPENDIX I - Management Questionnaire Results

### Observation from Research Questionnaire [a].

**(a) Describe the major differences involved in the implementation and management of the BSc in Product Design as a cross-college program as distinct from the general programs within your school or department. A(a)**

The main challenge is that it is a cross college programme which creates difficulties from a management point of view. Basically I have tended to focus on that part of the programme for which I am responsible which mitigate against seeing/viewing the programme as an integrated whole. The USP of the programme is that it is unlike our competitors, integrated across Engineering, Design and Business.

There is a further problem that in DIT students can only be registered to one school so the other schools are seen as merely providing service teaching and not driving the programme unlike a programme in my own department. (111A)

There are huge logistical problems in running a programme in three Schools. Dealing with issues on a Programme within the School is much easier. The management of a multi-site delivery is a significant problem particularly as solutions to various problems may be outside the jurisdiction of the management of the Programme. Promoting a shared vision of a Programme from practitioners in different sites whose lens may have a different focus is a real challenge. This is normal as professional training tends to orientate individuals in disparate ways. (128E)

The main difference, from a management perspective, is the fact that the programme is run between three different schools in three different colleges. Although the programme resides in one school a management input is required from all but, there are no policies, procedures or protocols in place to support this activity. (143A)

Firstly it is the geography that plays a big part – we simply don't engage with staff and students in the same way. The subtle differences in operation across locations and Colleges is also clear to see. The broader disciplinary ethos/assumptions between the three 'parts' is evident but generally a positive element (150B)



(1) Engineering department operates differently to an Art & Design Department. Engineering-rigid; Art & Design - Flexible. (2) Business was situated somewhere in between. (3) Needs both sets of management to be committed to the programme. (4) "It might be better without management" (102E)

**(b) What have been the major difficulties experienced (if any) in the implementation of the program. A(b)**

Developing , maintaining and exploiting the programme as an integrated programme – see above . Ironing out differences in the 2 cultures , pedagogical approaches of engineering and design.(111A)

Designers and Engineers have a completely different lens to their world view and not enough attention was paid to this in initial Programme design. External Examiner's Reports were critical of aspects of the Programme. A blame culture developed i.e. a view that it was a Mountjoy Square problem or a Bolton Street problem. In that atmosphere it was difficult to get the students to see Product Design as an integrated Programme while at the same time lecturing staff were demonstrating that it was not integrated Programme. Students at times exploited this weakness. It is difficult to have good staff relations with a multi-site delivery model. (128E)

The main difficulty has been the cultural difference between design and engineering practice. Finding common ground and a common language took longer than expected. This often led to misunderstanding about what was being delivered and how material is delivered.(143A).

Distance and geography – changes emerge in one location and impact on the operation here. Assumptions about staffing timing etc are often made and then communicated. More cut-and-dried approach to problem solving and management issues than my experience elsewhere, (150B).

(1)Timetabling (trying to operate one site - one day policy). (2) Removing engineering "hat" when discussing DT001 (3) All partner buy in. (4) Don not traet it as service teaching (5) Sometimes shared responsibility = no responsibility (6) Resources (space, lecturers, capital funding), (102E)

**(c) If there were difficulties in the implementation and management of the program how have they, or are they resolved. A(c)**

These difficulties have recently being acknowledged and measures to overcome them have been in place for the last 18 months. The 2 major sections of the programme have appointed representatives who work together on joint initiatives and are aware of the importance of achieving integration for the long term sustainability of the programme (111A)

Dialogue between Heads of School and Heads of Department at the various sites was a starting point. However the catalyst for integration and Programme Development was and is the personal relationship between Michael Ring in Bolton Street and Robert Tully in Mountjoy Square. As this bond and trust between the two of them developed it opened a new, exciting and creative dynamic which transcended the Programme. New and integrated modules were developed by Robert and Michael as well as module changes from Semester to Semester and from year to year. This highlights that progress, professionalism and development is really driven by the capacity generated by human relationships. (128E)

The resolution proved simple but not easy. It began when the key programme leaders reached the place where they were sufficiently comfortable to begin an open dialogue. This led to the development of a real 'partnership' in programme delivery and a more rounded student experience. (143A)

Yes these things do get resolved. Dialogue usually sorts out the relatively small issues but it can be frustrating. For example, there was an assumption that two staff members here would be available for 3 hours (!!!) to supervise projects. An earlier discussion would have been better as some input from here would have been achievable While resolved (I don't know how) it does mean that there is no involvement in the final year project for business staff. (150B)

(1) Talk, (2) Meetings (3) Delegate Responsibility (4) Outside influence (External Examiners etc) (5) Lead lecturers from Art & Design & Engineering. They operate on the solution principle rather than the management principle of problems. (102E)

**(d) What are the major strengths of the BSc. In Product Design? A(d)**

The combination of Design ,Engineering and Business which is unique in this island and rare in other parts of Europe (111A)

The whole is created by the integration of Design, Engineering and Business. DIT is very strong in all of these areas. Having students travel to Bolton Street, Mountjoy Square and Aungier Street allows the students of Product Design to absorb and practice the culture and ethos of these disciplines. Having Michael Ring in Bolton Street and Robert Tully in Mountjoy Square is a great driver of Programme Development due to their commitment and work ethic to the Programme. Roger Sherlock has also been the rock on which the developments on the Aungier Street campus were developed.(128E)

The broad range of inputs to the programme (from Engineering, Design, Business and Marketing) result in a rounded student experience. Graduates understand the dynamics that operate in the marketplace and are well-placed to negotiate in this environment.(143A)

A genuine tri-disciplinary programme. Staff highlight the emergence of very different strengths, approaches and conceptualisation by students. Ability of students to win significant NPD competitions is a positive endorsement of the output. However, I have no indication where graduates are working .....(150B)

(1) Cross Faculty (College), (2) Cross Faculty, (3) Cross Faculty. This programme would be vastly inferior if it was contained within one faculty (college), (102E)

**(e) Do you believe that the current structure of the BSc in Product design is best suited to the on-going development of the program? A(e).**

No its not the optimum structure even though it is fairly efficient. The structure – modules , types of modules , sequencing of modules etc has to be constantly examined in the light of the need to achieve integration. The integration of the 3 major areas is a huge task which will take several iterations of the structure to achieve.

The programme has probably got too many distinct modules and we need to look at modules which are fatter and which encourage students to integrate engineering, design and business in their practice as designers. (111A)

Yes, I believe that recent development in Programme structure and design is very positive and fit for purpose. It is necessary to have more International design connections to promote Programme Development and to benchmark our Programme Networking at Conferences/Seminars is essential. It is also necessary to develop strong links with practitioners so as to get an Industrial perspective which will aid in Programme design.(128E)

Not completely. It is working from the student perspective but, from a management perspective there are problems. The Institute has positioned Schools as profit centres that report on Income & Expenditure on a model where 'funding follows students'. It doesn't recognise partnerships between Schools with the result that the students are attached to one School and the Income flows there also. Other Schools simply receive payment for 'service teaching'. This model contradicts the principles of partnership and discourages genuine cooperation. It also ignores the management cost to partner schools.(143A)

Never! It always needs refinement (not just tampering) based on real reflection on the inputs, outputs, external examiners. It's unlikely that a programme gets it right first time. Some reviewing is needed, but no more than most undergraduate programmes. (150B)

The module format is best suited for the on-going development as it allows us to make changes (for the better) while still being QA compliant. Its structure is at least 90% correct. Perhaps a six month co-op in industry during their 3rd year would be beneficial though this would reduce contact hours which could be detrimental. (102E)

**(f) Do you meet your management colleagues involved in the BSc in Product Design on a regular basis? A(f)**

I meet my counterpart in Engineering fairly regularly but rarely talk to my counterpart in Business. (111A)

Honestly, no. I am very remiss in meeting colleagues in Mountjoy Square. This is probably a tribute to the work of Michael Ring and Robert Tully and to no major problems or obstacles hampering Programme development.(128E)

No. There are no protocols or procedures in place to support regular meetings between the Heads of School and/or Departments. Such meetings take place on an ad hoc basis which is

not particularly conducive to strategic planning. This is exacerbated by the point made in the previous question. There is no incentive for those not in receipt of funding to meet.

(143A)

No, not enough. Geography again. Oddly open days, DIT-wide meetings etc are the times where most discussion happens rather than scheduled meetings.(150B)

(1) Own head of school - daily (2) Head of Department on Team - approximately 3-5 times/year (3) Full management team - 1/year. The reality is that the majority of the management occurs from 1 department with the complicit agreement of the other departments. (102E)

**(g) With what you have learned from your experience of the development, implementation and management of the BSc. In Product Design, what recommendations would you make for similar cross-college educational interventions in the future? A(g)**

Students will need to be registered to all schools or to no school – however this is a DIT wide problem .The challenge is to ensure that some schools do not see their role as mere service providers with real ownership residing in only one school.

The Programme Committee/Team has to meet more regularly and in a more intensive fashion to monitor and implement an integrated programme. Away days , show and tell sessions are vitally important so that all lecturers in the programme understand the structure and USP of the programme

The development of the Programme Document will have to involve all staff equally which makes it difficult in practice – this will take a lot of time and involvement but it is necessary if you are to get buy in from all involved. (111A)

Promote a holistic approach. The main drivers of the Programme need to have trust in each other. All players should know, articulate and discuss their goals and expectations for the Programme. Multi-site delivery needs more meetings than traditional one site delivery. Management support and appreciation of work done at Programme level is a must. Have a Programme Development Forum outside of the Programme Committee. (128E)

It is not sufficient for an organisation to posit the promotion of collegiality, partnership, multi-disciplinarity etc. while structures, policies and procedures contradict this position. A mechanism to recognise the input of each School in the Income & Expenditure reporting is a prerequisite for future partnerships. (143A)

We can do this kind of thing! It is manageable, suitable and beneficial. However, this programme highlights a misconception - the fallacy around 'modular' opportunities that suddenly can provide endless programme opportunities; simply have a module catalogue does not make a programme. It is essential that the benefits of different disciplines are coordinated, logically linked and delivered in a fluid, coherent manner. Simply lobbing a range of modules together doesn't ensure any level of success. A programme design needs vision, leadership, support and all the other elements that make up the functioning of a school/department. Also, it has been valuable to develop an insight into other areas of DIT to see the strengths, mechanisms of operation, learning styles, heritage and culture evident in such a diverse institute.(150B)

(1) Don't make ownership a priority (2) Be open to trust (3) No one person knows the exact outcome. (4) Allow lecturers more opportunity to develop their own ideas (5) If management is shared....make sure everything gets completed. (102E)

**(h) What do you see as the role of management in the development and implementation of cross-college programs of this nature? A(h)**

As above management have to devise a structure where the programme is managed by all the schools .This is difficult given demands from individual schools and departments. (111A)

Strategic vision for the Programme.

Managing and solving problems as they arise.

Promoting a holistic approach.

Facilitation of all issues.

Appreciation of all efforts of staff.

Getting rid of obstacles to progress.

Keeping a focus on what is good for the Programme and for the students. (128E)

Leaders need to encourage and support staff to engage while seeking to put appropriate supports in place. (143A)

Must be driven by market need; careful analysis of potential is crucial. The danger of creating a 'pick n mix' flavour based on perceived need is a real issue. A key learning is that integration in the design, operation, recruitment of students and development of the programme needs very close involvement from a team. (150B)

(1) To nurture ideas among lecturers and support them in their development. (2) Organise "blind-dates" or "speed-dating" (3) remove impediments (4) Check "has it been done before" (5) Locate resources. (102E)

## **APPENDIX J - Staff Questionnaire Results**

### **Observation from Research Questionnaire [b].**

**The content in this document are the observations made in response to the data analysis from the questionnaire distributed to staff teaching on the BSc. in Product Design (DT001), at the Dublin Institute of Technology.**

[104-2] A high percentage of Arts respondents indicated they are members of professional bodies or associations (88%). Business respondents were similarly motivated to become members of professional bodies with 83% indicating membership of professional bodies. (However both these disciplines still had a high percentage of staff associating their professional identity with teaching. In the case of design we cross the threshold into the teacher/practitioner). Only 44% of Engineering respondents claimed membership of professional bodies. This correlates somewhat with the findings from 106-2 that suggest that a higher percentage of Engineering respondents associate their professional identity with teaching. Business respondents had the lowest association of professional identity with teaching.

[106-2] Engineering which has the lowest membership of professional bodies (44%) there is a stronger association with teaching as their professional identity. However, even where the professional membership is very high in Arts and Business 50% of respondents still associate their professional identity with teaching.

[107-2] 78% of the staff who responded to the questionnaire indicated they were engaged in research activities associated with their discipline. There were no significant differences between the disciplines with Business ranking highest at 83% and Arts lowest at 75%.

[108-2] Only 40% of staff indicated that they were involved in consultancy linked to their discipline with Arts as they highest group at 75% and Engineering the lowest at 22%. The teaching/practice aspect of Art & Design education appears to play a significant role in this area, as many teaching staff in the Arts area generally would maintain a strong professional profile. There is a significant literature which explores this particular aspect of both design and the arts in general.



[113-4] Of the staff teaching on the programme, 36% have worked within industry as product designers. Approximately two thirds of those who have worked in industry were from the Arts, (these are individuals qualified as product designers or designers working within the product design field) and one-third from Engineering.

[114-4] While no staff from the Business college worked as product designers 33% indicated that they had worked in conjunction with either product designers or product engineers. A further 40% of arts staff indicated that they similarly while not working as product designers, they too had worked with product designers or product engineers in industry. 43% of engineers were similarly categorised. The data suggests that the program has a staff with good experience and strong links to the reality of the external product design environment.

[115-4] 45% of respondents involved in the BSc in Product Design have a formal qualification in design. 100% of Arts respondents indicated having a design qualification. In the case of Arts this also includes those with qualifications in History of Art and or Design. It is also worth noting that 22% of respondents from Engineering also indicated having formal qualifications in design.

[116-4] While 41% of respondents teaching on the BSc in product design have an engineering qualification, 89% of these are from within engineering and 13% are from within arts. This dual design and engineering qualifications referenced in Arts are primarily linked to post graduate qualifications where designers have seen the benefit of having qualifications in both fields as relevant to their career pathways.

[118-5] None of the Business respondents who teach on the BSc in product design are involved (or perceive their role) in the management of the program. The Head of Department by virtue of his position is strategically involved but the implication is that on this type of programme there is a limited voice for teaching staff, particularly from some areas (Business). Arts staff involvement in the management of the program is 13% in comparison to Engineering involvement at 22%.

[119-5] 65% of respondents to the survey indicated they teach on other programs within their departments. 100% of the Business lecturers indicated they teach on other programs in their departments. There are no Business staff dedicated to the program delivery.

[120-5] 45% of the total respondents indicated that they teach outside their own department but within their School. Only 14% of Arts respondents teach outside their own department but within the School of Art, Design & Printing. This compares to 75% of engineering staff who indicated that they teach on programs outside their departments. They tend to move across the school more readily, with Business respondents somewhere in the middle.

[121-5] Approximately two-thirds of the staff involved on the programme teach outside their own school. The spread is not substantially different across the disciplines. This would suggest that a substantial number of the programme staff are involved across schools. (However, data from the next question analysed would suggest that this is primarily focussed within their disciplines)

[122-5] 19% of respondents indicated that they teach on other multi-disciplinary programs. However the figure for Arts is at only 13% against the 25% for Engineering, suggesting that Arts respondents are not heavily involved in other programs.

[123-5] Half of the total respondents have undertaken collaborative activity with colleagues from other schools or departments. The highest multidisciplinary activity has been within Arts at 63% with Business being down to 20%. The figures correlate with the efforts being made to engage the Arts and Engineering aspects of the program in more constructive collaborations.

[124-5] All of the staff who indicated that they have previously undertaken collaborative work were positive about the benefit of collaboration from this experience.

[125-5] 50% of respondents were in agreement that the programme is conducive to collaborative activity. However, as many as 35% were uncertain of this. 17% were in disagreement that the programme is conducive to collaborative activity. When the figures are broken down into discipline responses we see a substantial difference in the discipline viewpoint. Engineering is very much in agreement with almost 80%, however two thirds of Business are uncertain. Arts respondents view is that the programme is not conducive to collaboration with 50% of staff disagreeing that the programme is conducive to collaborative activity. (This may relate to the fact that many Arts programmes have a strong collaborative content and this may weigh the respondents against an enthusiastic perception of collaborative activity here.

[126-6] Over 60% of the total respondents felt that collaboration was a positive characteristic of the Programme. Only 50% of Business respondents however felt this was the case. 25% of arts staff disagreed that collaboration was a positive characteristic of the programme. Almost one third of all respondents were uncertain.

[127-6] Over 90% of respondents to the survey agreed that increased contact between disciplines would improve collaboration on the programme. Contact between staff can manifest itself in a variety of ways from informal to formal, however, the 'relationship' elements of 'collaboration' arise as a relevant contextual issue and are expressed here in the most positive terms. All of the respondents from Arts and Engineering were of the view that increased contact between staff from different disciplines would improve collaboration on the program. However, one third of Business respondents were uncertain.

[128-6] The majority of total respondents felt that students understood the rationale behind the collaboration on the BSc. in Product Design. This is a question of both perception and teacher position. In fact without surveying students we do not have an exact picture of what their position or understanding is. However, the perception of staff is important in so far as the staff perception of student positionality could influence the classroom, studio or lab relativism regarding the whole programme. Seeing your subject, or discipline in the context of other subjects and how they might be understood by students is an important 'integrative' concept.

[129-6] This statement is broadly concerned with the perception of collaboration. Three quarters of respondents felt that staff understood the rationale behind collaboration on the BSc. In Product Design. The concern here is the lack of certainty that is suggested in up to one quarter of the staff. Committing to and communicating integrative values needs to be a comprehensive concept at the teaching level. This correlates with a degree of stated negativity expressed by some respondents regarding the relevance of collaboration in some areas. It is also important to appreciate that collaboration may not be relevant in all areas or at all times and therefore not all respondents would see this as a positive thing.

[130-6] When asked about the structure of the BSc. in product design just less than half the respondents felt it was appropriate with almost 40% uncertain at this point. Discipline difference arise around this question, with 'college' relationships reflected somewhat in the figures. Over two thirds of Engineering respondents felt it was appropriate, while only 38%

of Arts respondents were of the same opinion. Business respondents were less favourable disposed at only one third with the remaining two thirds uncertain. This suggests a lack of engagement in the 'overall' picture, a reflection upheld by a number of Business staff narratives.

[131-6] While 43% of the respondents were positively disposed to the idea that the synergies between the schools are natural and appropriate for the delivery of the program, almost 40% were uncertain of this. Almost one third of Business respondents did not believe the synergies to be natural and appropriate with a further 50% uncertain.

[132-6] Only half the staff claimed to understand the relationship between the various modules on the program, with no Business staff claiming to understand the relationship, suggesting that there needs to be a more dynamic engagement with this group to enhance the overall programme. On the other hand over three quarters of the Engineering respondents understood the relationship with 50% of Arts respondents claiming to understand these relationships.

[133-6] Only 40% of total respondents indicated that they believe the current balance of subjects is appropriate to the development of a product designer. A further claim to be uncertain about the balance. With regard to perceptions within the discipline areas, 56% Engineering respondents agree with the balance while only 17% of the Arts respondents feel the current balance is appropriate.

[134-6] Less than 10% of the total respondents felt that the contact between the different disciplines is adequate. The narrative of both management and teaching staff highlights this particular issue and provides some insights into why that may be the case. However, it is clear from these figures that this is an aspect of the programme that needs to be addressed urgently.

[135-6] Less than one third (30%) of respondents are aware of what other people do in terms of teaching on the BSc. in Product Design. In a disciplinary context Arts respondents have the lowest awareness, with one quarter being unaware of the teaching methods used by colleagues. A body of literature referenced in this study does recognise the differences that exist in teaching methods etc between disciplines, however, awareness of the different methods engaged by others on a single program could be an important part of understanding the overall ethos and being able to communicate that to the students.

[136-6] Just under 40% of staff on the programme are aware of the assessment methods used in other areas. In disciplinary terms Arts respondents claim the highest awareness at 63% while Business respondents are as low as 17%. While Engineering sit in the middle with only 33% aware of the assessment methods used in other areas, the overall implication is that there is a poor understanding of the way the various contributors to the overall programme perform. This has implications for collaboration as an effective collaboration on content related aspects of the programme will inevitably require a negotiation around teaching and assessment methods.

[137-6] Almost 40% of staff who responded to the questionnaire considered the management style in the organisation to be characterised by teamwork, consensus and participation. Approximately 30% of respondents uncertain and 30% did not consider this to be the case. While there were some differences between the discipline areas these did not suggest any particular discipline orientation or bias. Interpreting the results is difficult in terms of a definitive argument, however, the ongoing evolution, (both real and perceptual), from a collegial to a managerial culture of management could account for the general figures.

[138-7] Over three-quarters of the respondents indicated that they felt disciplines within higher education institutes had distinct cultures. With 88% of Arts respondents agreeing this position. No respondents in any category suggested this not to be the case, however, 22% indicating uncertainty. This research indicates that a substantial majority of staff consider disciplines to have distinct cultures.

[139-7] 83% of the respondents indicated that they feel that departments within higher education institutes have distinct cultures. The department culture position was particularly significant in engineering (89%) followed closely by Arts (88%). However, the only dissent to the perception of department cultures came from Arts where over 12% of respondents did not consider this to be the case. Interpreting the data would clearly indicated that the vast majority of respondents consider departments to have distinct cultures.

[140-7] Over three-quarters of respondents indicated that they believe Schools within institutes of higher education have distinct cultures. The research data indicates there was no dissent on this point but that 22% of respondents were uncertain. Business staff responded most positively regarding school culture with 83% and Arts lowest at 75%. It should be noted that only slight variances emerge between staff perceptions of culture within discipline,

department and schools, but there are differences that could warrant further investigation. These could be influenced by particular discipline, department, school or institute circumstances that do not have general application or they could be trends worth considering.

[141-7] When asked if co-operation between disciplines is affected by the nature of the disciplinary cultures 61% of respondents felt it was. 26% were uncertain and only 13% indicated that cooperation between disciplines is not affected by disciplinary cultures. This perception would support a view argued within some of the literature that cooperation is most usual within disciplines and less frequent between disciplines.

[142-7] When provided with 6 terms plus an option to provide their own term to describe the discipline differences between the schools contributing to the programme 30% of respondents selected 'complementary', 40% selected 'facilitating' and 20% selected 'complementary'. In no case did respondents select negative terms to describe the differences.

[143-7] 86% of respondents indicated that there should be more collaboration between discipline areas as a means to creating new synergies. While the general figures show an extremely positive disposition to collaboration there are discipline variants. All staff in Arts felt there should be more focus on collaboration while only three-quarters of engineering respondents were certain with 25% uncertain. This correlates with a body of the literatures on the subjects of design and collaboration where it is understood that collaboration features in all relationships in the design arena.

[144-7] When it was proposed that one of the barriers to collaboration on the BSc in Product design is in fact the prevailing institutional structures, over 64% of respondents agreed, with all the Business respondents agreeing with that suggestion. This reflects a number of points that arise within the narrative that indicates limitations currently existing around geography. The Business narrative is particularly strong around this issue.

[145-7] Almost all staff (96%) felt that collaboration offers new opportunity to develop the program. The only uncertainty around this was raised within Engineering. No staff had a negative position regarding collaboration. There is a substantial literature that argues the benefit of collaboration. It is clear that staff acknowledge the benefits of collaboration.

[146-7] As part of the research undertaken this question was used as a cross check against the perceived benefits of collaboration as proposed in a previous question. When it was

suggested that the program would develop more effectively without constructing collaborations 14% of respondents agreed with this position. There was no substantial discipline bias regarding this position. However, the emphasis here has to be placed on the word 'constructing' in terms of collaboration. An interpretation of this data would suggest that while an overwhelming number of staff agree that collaboration is a means of developing the program not all would agree in constructing these collaborations. Allowing synergies to emerge is also an important aspect of development.

[147-8] Only 27% of respondents felt that there should be more focus on strengthening disciplines and less on collaboration. 50% of respondents were uncertain about this issue, with 23% suggesting more focus on discipline. While there were discipline variations on the subject, all three discipline areas had a mixed response with none showing a comprehensive variance.

[149-8] Only 18% of respondents felt there is adequate contact between the different disciplines on the BSc in Product Design, with 50% indicating that the contact was not adequate. 32% were uncertain, with three quarters of Arts respondents of the view that contact between the different disciplines was not adequate and none happy with the current contact.

[150-8] Only 13% of respondents felt that there should be more focus on engineering content on the BSc in Product design with only 22% of engineering respondents of that view. While 35% were uncertain of the situation the majority of Arts and Engineering respondents felt there was no need to increase the focus on Engineering. Of greatest significance from this set of figures is the 83% of Business respondents who were uncertain. This suggests that the lack of engagement in the Day to day aspects of the program may lead them to have difficulty assigning 'perspective' about the development of the program.

[151-8] Almost half of the total respondents indicated that they felt there should be more focus on the creative design content of the program. This is significant in terms of the fact that no Business respondents agreed with that viewpoint. Business respondents were once again uncertain (83%) of the situation. The remaining discipline breakdown includes 88% of Arts respondents felt there should be more creative design content, while 44% of Engineering respondents felt the same. Only 33% of Engineering respondents felt that there is adequate creative design content currently on the program. No Arts respondents felt there was an

adequate input of creative design. This represents considerable discipline variance which has been thrown up around the area of creative design. This appears to be a contentious issue in that its balance defines the program emphasis, ethos or 'culture'.

[152-8] With regard to the focus on business content on the BSc in product design almost 40% of the total respondents felt there should be more focus with 43% claiming to be uncertain about this issue. Only 17% did not feel the need to increase focus on Business. The discipline breakdown is interesting in so far as 56% of Engineering respondents feel the need for more focus on Business, while only 17% of Business respondents feel the same. The narrative from Business respondents would support the data outlined here in so far as they see themselves as service teaching and the subsequent lack of ownership results in a lack of commitment in terms of additional focus on there discipline area. An alternative viewpoint is that they feel the level of input is appropriate, however, the 67% uncertainty figure would indicate this unlikely to be the case.

[153-8] Only 27% of respondents saw the separate campus locations as a positive experience for the students. It is acknowledged that this study does not seek the perspective of students on this matter; the position of staff is less than positive regarding this aspect. A considerable narrative from across the teaching staff and management staff also reflects this viewpoint.

[154-8] 64% of respondents indicated that their own experience of being a student in higher education has informed their view of discipline identity. The discipline difference is striking. Both Business (83%) and Arts (75%) related their own experience as students to their discipline identity building. However, only 38% of Engineering respondents related discipline identity to their own educational experience.

[155-8] Just over half of respondents felt that the separate campus locations facilitate the students in experiencing the diversity of disciplines on location. 75% of Engineering respondents felt the separate campus locations facilitate the students in experiencing the diversity of disciplines on location, with only 38% of Arts respondents sharing their enthusiasm. Consideration must be given to the nature of the physical locations and the way in which the disciplines support students ot the different locations. This would differ considerably between the various sites and could influence the staff perspective.

[156-8] Only 36% of respondents across the BSc in Product design indicated it is important for students in Higher Education to identify with a particular culture. 32% were uncertain



and 32% did not feel it important to identify with a particular academic culture. While there were disciplinary differences with Arts indicating 50% it was not important and Business with 17% of the same view, in general there was a broad balance. A possible inference to extract from this is the view on the program that the mix of academic cultures in principle is a positive experience and the identification with a particular culture on this type of program is not at this point a polarised discussion.

[157-8] 70% of respondents acknowledge that there are considerable differences in how arts, engineering and business address the teaching and assessment of academic content. 30% indicated they were uncertain. In terms of discipline perspectives, 88% of Arts respondents acknowledged the differences with Business (67%) and Engineering (56%) showing slightly lower figures.

[158-8] 91% of respondents acknowledged that it is important for all staff delivering on a program like the BSc in Product design to be aware of the teaching and assessment methods used by other disciplines. In terms of discipline perspectives 100% of Arts and Business respondents acknowledged this need with 78% of Engineering respondents in agreement.

[159-9] 50% of respondents indicate that they believed students are aware of the differences between the discipline cultures on the program, with 27% indicating that they are uncertain about this. In practical terms this is little more than a perception of where students are at in relation to this issue, as students have not been canvassed as part of this study. However, these perceptions are important in terms of the messages that staff communicate to students regarding the overall program. In terms of the discipline breakdown, three quarters of Engineering respondents felt that students are aware but approximately one-third of Arts and Business respondents considered that students were aware of these differences.

[160-8] Only 17% of staff felt that the course leaders should construct the modules and direct staff to collaborate as appropriate with 57% of respondents against such an approach. So while responses from staff clearly acknowledged the need for collaboration on the program, the way the collaboration is structured is important for how it might well be perceived by staff.

[161-8] A bottom up approach of developing collaboration at the module level and seeking to generate synergies between disciplines was approved by 87% of respondents across the program. This emphasises the way that collaboration and synergies should be facilitated.

[162-9] A large majority (87%) of respondents do not believe that disciplines should teach in a similar way in higher education. Appreciating and acknowledging the differences between the ways of teaching across disciplines is an important condition for constructing effective collaboration.

[163-9] A large majority (87%) of respondents do not believe that disciplines should assess in a similar way in higher education. Appreciating and acknowledging the differences between the ways of assessing across disciplines is an important condition for constructing effective collaboration.

[164-9] A large majority of respondents teaching on the BSc in Product Design believe that a mix of teaching and assessment methods enhances the breadth of the program. The main discipline difference within this data set relates to one-third of Engineering staff who are uncertain if this is the case. Both Business and Arts were unanimous (100%) on this issue.

[165-9] 65% of the total respondents regarded their discipline as being well defined. Engineering was most confident (89%) with Business (83%) also confident about their discipline. However, only one quarter of Arts respondents felt their discipline was well defined. This in many respects correlates with the inherent multi-disciplinary nature of this field and breadth of context within which it operates.

[166-10] 35% of respondents across the program indicated that their discipline needs to be protected and defended with 43% indicating that they do not believe their discipline needs to be protected and defended. When we analyse the responses from a discipline perspective there is a considerable difference emerging. Only 13% of Arts respondents believe their discipline area needs to be protected and defended with 75% suggesting no need for protection and defence. One third of Business respondents felt the need to protect and defend their discipline with one third suggesting no need for protection or defence. 56% of Engineering respondents felt the need to have their discipline area protected and defended with only 22% indicating that it did not need protection and defence. This data indicates a polarisation between Arts & Engineering around the subject of defending and protecting the existing discipline reflecting the strong disciplinary tradition in Engineering and the broad interdisciplinary nature of design.

[167-10] Almost two thirds of respondents associate their academic discipline with an external professional discipline. Arts respondents indicated the strongest association with the

external professional discipline (75%) with Business having the weakest association (50%). Engineering reside between the two at 63%. This data can be interpreted as a reflection of a strong teaching/professional bias that occurs within Higher Education Arts education in general. This aspect of Arts education (in this case specifically linked to Design), is recognised within the literature on academic and professional identities and constitutes a significant consideration in the nature of pedagogic practice within design.

[168-10] Approximately two thirds of respondents indicated that there is a clear perception of their discipline externally. When considered within a discipline context however, substantial differences emerge. 88% of Engineering respondents indicate that there is a clear perception of their discipline externally, with 67% of Business respondents acknowledging a similar perception. However, only 38% of Arts respondents acknowledge that there is a clear understanding of their discipline externally which once again highlights the ambiguity that exists within the Arts and discipline discourse. This data set can be interpreted as reflecting a strong discipline confidence within both Engineering and Business reflecting the established boundaries that exist around these disciplines in Higher Education.

[169-10] Subject specialism can be considered within the discipline context, but can be viewed almost as a subset of the discipline. 55% of the respondents indicated that their specialism is well defined with 18% indicating that it is not well defined. Interrogating the data as a whole would allow an interpretation that suggests that the interdisciplinary nature of the program concept is impacting on the subject specialism's more than on the discipline context and that crossing boundaries has an effect on clarity around some of the subjects. When we examine the discipline breakdown we can see that 83% of Business respondents believe their specialism is well defined. While engineering is at 50% and Arts at 38%. In fact 38% of Arts respondents indicate that their subject specialism is not well defined. We can also interpret the Arts data in terms of the degree of ambiguity that is central to the discipline.

[170-10] Almost three quarters of respondents indicated that the boundaries of their subject specialism are flexible. Given previous figures it is no surprise that 88% of Arts staff acknowledge this boundary flexibility. However, both Engineering (63%) and Business (67%) indicate that the boundaries of their subject specialism's are also flexible. Only staff from the Business area (17%) argued that their subject specialism's did not have flexible boundaries.

[171-10] Only 18% of respondents regarded discipline knowledge as the most legitimate form of knowledge. In discipline terms however, 38% of Engineering respondents viewed discipline knowledge as the most legitimate form of knowledge. This is in sharp contrast to Business respondents, none of whom saw it as such. Only 13% of Arts respondents regarded it as the most legitimate form of knowledge. 75% of Arts respondents disagreed that it was the most legitimate form of knowledge, with 50% of Business respondents and 38% of Engineering taking that position. This data can be interpreted in the context of the rigidity of traditional discipline boundaries.

[172-10] Just over one quarter of respondents indicated that their discipline area has a very clear approach to how it should be taught. The data suggests that in over half of the responses made that respondents did not feel that their discipline area had a clear approach to how it should be taught and that both Arts (63%) and Business (67%) were particularly high regarding this perspective.

[173-10] Just over one third of respondents indicated that their discipline area has a very clear approach to how it should be assessed with 39% indicating that in fact their discipline does not have a clear approach. In the breakdown of discipline responses no Business respondents indicated that their discipline had a clear approach to assessment and two thirds of them felt it did not have a clear approach. Half of Arts respondents indicated they had a very clear approach to how the discipline needed to be assessed with Engineering at 44%.

[174-10] The majority of respondents indicated that their discipline could accommodate different ways of teaching and assessment. 100% of both Arts and Engineering respondents indicated their respective disciplines could accommodate different ways of teaching and assessment. This is an important position to take in the context of collaboration, as a failure for disciplines to be able to accommodate different ways of teaching and assessment could limit the potential to develop real collaboration.

[175-10] Over half of the respondents indicated that their discipline uses very different teaching and assessment methods to the other disciplines on the BSc in Product Design. Over one third were uncertain if this were the case and a small number (13%) felt it not to be the case. When we analyse the data regarding discipline differences we can see a substantial difference between the Arts perspective, with 75% of respondents indicating that they use different methods, against Business at 33% and Engineering at 44%. This difference in

perspective around teaching and assessment methods corresponds with the literature on discipline differences where the 'soft' nature of Arts content contrasts with the 'hard' nature of Engineering content.

[176-1-] 13% of respondents indicated that they believe that the different teaching and assessment methods used on the BSc in product design confuses the students. 52% felt it did not confuse students and a further 35% were uncertain.

[177-11] 17% of respondents indicated that the interdisciplinary approach lacks disciplinary rigour with 43% indicating that it does in fact have disciplinary rigour. However 39% of respondents were uncertain of whether or not the interdisciplinary approach lacks disciplinary rigour.

[178-11] Only 13% of respondents considered that engaging in interdisciplinary work may lead to academics becoming 'jack of all trades and master of none'. 70% indicated they disagreed with this perspective.

[179-11] 91% of respondents indicated that an interdisciplinary approach contributes to the growth of knowledge. A small percentage (9%) were uncertain but none disagreed with this perspective. This indicates a strong support for interdisciplinarity, which given the nature of the program is a positive position for the staff to have taken.

[180-11] Almost three quarters of respondents indicated that in their view working across discipline boundaries improves teaching practice. This high approval rating contributes to a positive disposition towards the interdisciplinary approach used on the BSc. In Product Design.

[181-11] Just over half of the overall respondents indicated that real world issues and problems should be the focus of educational activity. However discipline differences arise with regard to this issue. While 83% of Business respondents felt that real world issues and problems should be the educational focus both Arts (50%) and Engineering (44%) had a less definite position. While neither Business nor Engineering respondents disagreed with this position, 38% of Arts respondents suggested that real world issues and problems should not be the focus of educational activity.

[182-11] 83% of respondents indicated that many problems and/or issues cannot be defined or understood by a single discipline and require an interdisciplinary approach. No respondents were in disagreement with this position however 17% were uncertain.

[183-11] When challenged by the suggestion that Interdisciplinary studies at undergraduate level will weaken the knowledge base of established disciplines, only 4% of respondents were in agreement. 48% of respondents indicated their disagreement with this position and a further 48% were uncertain. In interpreting the data we can see that while respondents don't see Interdisciplinary studies at undergraduate level weakening the knowledge base of established disciplines there is still an underlying concern about how they will impact on the discipline context.

[184-12] 13% of the respondents agreed that the advance of specialisation has rendered many disciplines too complex for undergraduate study. Over half of the total respondents indicated that they were not in agreement with this viewpoint. 35% of respondents were uncertain. This position conflicts with some of the literature.

[185-12] Almost half of the respondents indicated that discipline specialisation would be best placed at post graduate level in order to provide an interdisciplinary base to a student's overall study. However a further 39% indicated they were uncertain with only 13% arguing against such a position. However there were definite discipline differences on the subject with 88% of Arts respondents indicating that discipline specialisation would be best placed at post graduate level in order to provide an interdisciplinary base to a student's overall study in contrast to no Business respondents in agreement. Less than half of Engineering respondents were in agreement with this suggestion. In terms of the discipline polarisation indicated by the data, the nature of the work undertaken within Arts, would be more interdisciplinary in nature, with a natural tendency to specialise within a discipline at post graduate level. While this is essentially the same baseline for Business and Engineering the reality is that they both tend towards a more discipline orientation in undergraduate than does Arts. The data bears out the difference.

[186-12] Just under half of the respondents agreed with the contention that students must first reach a deep understanding and knowledge of disciplines before they can tackle study across disciplines with 39% disagreeing with the position. However, as with the previous question the discipline differences emerge from within the data set to suggest a different picture. Over

three quarters of Engineering respondents indicated that students must first reach a deep understanding and knowledge of disciplines before they can tackle study across disciplines, with much less support from both Arts (38%) and Business (17%). In the case of Engineering the data indicates a strong discipline orientation. Almost two thirds (63%) of Arts respondents disagreed with this position once again emphasising the 'weaker' discipline orientation.

[187-12] Only 17% of overall respondents indicated that they prefer to teach within the boundaries of a single discipline. The data would suggest that 70% of overall respondents would in fact prefer to teach across boundaries. Discipline differences emerge from this data set. 100% of Arts respondents indicated that they were not in agreement with the statement, suggesting a preference to teach across discipline boundaries. However, both respondents from Business (33%) and Engineering (22%) indicated a preference to teach within the boundaries of a single discipline. Once again the stronger discipline orientation encourages staff to remain within that discipline domain.

[188-12] 35% of overall respondents indicated that they prefer to conduct research within the boundaries of a single discipline with 57% indicating that they did not prefer to conduct research within the boundaries of a single discipline. Discipline differences arise from the data set with 75% of Arts respondents indicating they do not prefer to conduct research within the boundaries of a single discipline. Only 25% of Arts respondents indicated a preference to conduct research within the boundaries of a single discipline with a more positive response from Business (33%) and Engineering (44%). The discipline influence is once again obvious from the data, suggesting that both Business and Engineering have a stronger discipline orientation.

[189-13] Three quarters of respondents indicated that they had read the course document for the BSc in Product Design. Only 56% of Arts staff indicated that they had read the document followed by Business (83%) and Engineering (89%).

[190-13] 71% of respondents indicated that it is necessary to read the course document in order to deliver your module on the program. Once again discipline differences do emerge. 83% of Business respondents felt it necessary to have read the course document in order to deliver your module on the program. This matched the results about whether or not they had read the course document. However, slight discrepancies emerge in both Engineering and

Arts. In Engineering while 89% had read the document, only 67% felt it necessary to do so in order to deliver their module. On the other hand in Arts, while only 56% had read the document, 67% felt it necessary. Given the small data set it is not possible to draw any major conclusions other than to acknowledge that the data could yield inconsistencies of this nature.

[191-13] 44% of respondents indicated that they are clear on the role of all the various modules that constitute the program. However, there are discipline differences which emerge from this data set. 70% of Engineering respondents indicated that they were clear on the role of all the various modules that constitute the program, in contrast with only 17% of Business respondents and 33% of Arts respondents. These results would suggest that in the main respondents were clear on the role of their own modules they did not have a cross-program perspective, even within Engineering, as Engineering would account for approximately 60% of the module content. To engender a truly collaborative program it is not only important that staff are comfortable with their own module role, but also to understand it in the context of the entire program.

[192-13] 72% of respondents indicated that they were familiar with the course structure if the BSc in product design. However, when this is broken down into discipline differences we observe some variances occur. All the Engineering respondents indicated they were familiar with the course structure, however only 33% of Business respondents were familiar with the structure. This reflects the narrative conception expressed by a number of Business respondents that their role was as "service teaching" and that they did not feel a part of the BSc in Product Design. 67% of Arts respondents indicated they were familiar with the course structure suggesting a degree of ambiguity about their role in the program also.

[193-13] 92% of respondents indicated that they deliver the syllabus in accordance with the outline in the course document. These figures would indicate a reasonable consensus across the disciplines, however when we interrogate the discipline data we find that while both all of the respondents in both Business and Engineering indicated that they deliver the syllabus strictly in accordance with the outline in the course document. However, only 78% of Arts respondents claimed to do so. While these figures are not significant, they do indicate a slight discipline difference in the way academics perceive structures. This is emphasised even more if we interrogate the data further in terms of the rating scale and where a significant number of Engineering (50%) and Business (67%) respondents indicated strictly in accordance while



none of the Arts respondents claimed that level of accordance with the delivery of the syllabus.

[194-13] 96% of respondents indicated that it is important or very important to have an overall picture of the module structure for the BSc in Product Design. The discipline differences that emerge are not hugely significant but do emerge. All Engineering and Arts respondents acknowledge the importance of having an overall picture of the module structure but only 83% of Business respondents indicated this to be the case. However, perhaps of more significance is that when asked if they were clear on the role of the various modules that constitute the program that only 17% of Business respondents were clear. This suggests a huge gap between the what is recognised as appropriate and necessary and what is the actual situation. While Business demonstrates the extreme in some respects, both Arts and Engineering also leave a considerable gap between theory and practice regarding this issue.

[195-14] 50% of the overall respondents indicated that they have contributed to the development of the curriculum for the BSc. in Product Design. With 41% of respondents indicating that they clearly had not. When we consider the discipline differences we find that 75% of Engineering respondents indicated they have contributed to the development of the curriculum while both Arts (38%) and Business (33%) are considerably lower. Interpretation of this data might suggest that the "ownership" element of the program might in some way contribute to the lack of contribution to the curriculum development. The day to day discussions that can occur within the physical location of Engineering where most of the staff delivering are located will engage staff in a much greater sense of ownership than on the Business and Arts sites where both students and staff are only engaged on a partial or peripheral basis. While this interpretation is mainly a speculative consideration of the data it does cross reference to some of the narrative concerns expressed by both staff and management located on these separate sites.

[196-14] Only 30% of total respondents indicated that they believe the curriculum has comprehensively integrated the various disciplines which contribute to the BSc in Product Design. A further 48% are uncertain. There are discipline differences which emerge, though these are not at odds with the general observations there are differences worth noting. 44% of Engineering respondents indicated that the curriculum has integrated the various disciplines, while only 33% of Business respondents are of that view. However, only 13% of Arts staff feel this to be the case with the highest number at 38% of respondents who would argue this

not to be the case at all. Clearly respondents' perception is that the current curriculum is not facilitating the type of collaboration that would integrate the disciplines in a more comprehensive manner. Already we have ascertained earlier in the research that this type of collaboration would be a very positive occurrence, suggesting that this is an area of the program that may need further investigation.

[197-14] Only 17% of respondents indicated that they believe that students can identify clearly the way the curriculum integrates the various disciplines which contribute to the BSc in Product Design. Discipline variations around this issue vary between Engineering, with 33% indicating that they believe students can identify the way the curriculum integrates the various disciplines to Arts where no respondents believe that the students can identify with the concept. Business holds the centre ground with 17%. This perception that students are not able to identify with the way discipline integration is manifest on the program is significant. Understanding the disciplines and how they relate to each other is an important part of the development of their understanding of who they are and how they will fit professionally. This data suggests this is an area that could benefit from further investigation. Interdisciplinary success will in some part be dependent on disciplinary understanding.

[198-14] 87% of respondents felt that they should have more opportunities to discuss and develop the curriculum for the BSc in Product Design. However from a discipline perspective, while all of the Arts staff were in favour of having more opportunities to discuss and develop the curriculum there was some uncertainty expressed by both Business (33%) and Engineering (11%) regarding this issue. While there is not a significant overall dissent at what might appear to be a natural part of the academic development agenda, it is important to give consideration to why there should be dissent at all. This research does not set out to determine an answer to that question, but as it has emerged it should be noted as a development issue for the program.

[199-14] 68% of the overall respondents indicated that they feel the major emphasis on the BSc in Product design is on Engineering. With a further 18% indicating that they are uncertain and 14% indicating that it is fact not the major emphasis on the program. The discipline differences that emerge provide an interesting insight to discipline perspectives. All the Arts respondents indicated that the major emphasis on the BSc in Product design is on Engineering, while only 50% of both Engineering and Business respondents indicated this to be the case. In fact, 38% of Engineering respondents indicated that they disagreed that the

major emphasis on the BSc in Product design is on Engineering. It is important to note that this data does not seek to place a value rating on whether this is appropriate or not, but simply to determine what individual and discipline perspectives are in relation to the emphasis of different disciplines.

[200-14] Only 27% of respondents felt that the major emphasis on the BSc in Product design is on Design. In general this position correlates with the view by view by 68% of respondents that the major emphasis is Engineering. No surprises emerge in that interpretation of the results. However, when we investigate the discipline differences we can see very different perspectives emerge. 63% of Engineering respondents indicate that they feel the major emphasis is on design, while none of the Arts staff agree. Only 17% of Business respondents would agree with this perspective. All of the Arts respondents disagree that the emphasis is on design. In considering the implications of the data set, we might conclude that Arts respondents perceive this to be an Engineering program while Engineering respondents perceive it to be a Design Program. Business respondents are uncertain in the main where it resides. These perceptions may also be heavily influenced by the discipline vocabularies that prevail within discipline. Design has very specific meaning within different disciplines and inevitably the perceptions will be expressed through that discipline lens.

[201-14] No respondents indicated that the major emphasis on the BSc in Product design is on Business. While less than one quarter were uncertain, over three quarters indicated that Business was not the major emphasis. There was no real discipline difference with regard to the role played by Business on the program.

[202-14] Only 18% of respondents indicated that they feel the balance between disciplines on the BSc in product design is right at present. 55% were uncertain of whether the balance is right or not and a further 27% indicated that it is not right at present. When we interrogate the data for discipline differences we find that 38% of Engineering respondents felt the balance is right at present, with only 13% of Arts and Business respondents of that viewpoint.

[203-15] Very few staff members provided a narrative input to the research questionnaire. However, when asked what they feel are the major Barriers to the development of the BSc in Product Design, a number of issues arose. The location of the program across different sites was seen as a barrier, (134B) resulting in limited contact between staff, (134B). The different philosophies that exist between faculties/colleges was also cited as a barrier, (134B). Another

barrier was seen as the amount of time available to individual lecturers, who were outside the core program to engage in its development, (112B). Institute policy and leadership were also cited as barriers (112B).

[204-15] When asked how improvements could be made to the BSc in Product Design, a number of suggestions were made. The Business College involvement should be strengthened on the program, (112B). More collaborative work should be undertaken across the colleges, (112B). More inputs should be provided to prepare students for job hunting when they exit. (112B).

[205-15] When asked to indicate the major strengths of the BSc. In product Design, a small number of points were made. The program has a core of dedicated lecturers and management, (112B), with students who are, in the main, bright and engaged in the subject, (112B; 134B). Another strength of the program is seen as the relatively small class size, (134B), and the mix of subjects, (134B).

[206-16] When we look at the data around the age profile of staff teaching on the BSc in Product Design we find a strong mix of experience. 40% of the respondents had less than 5 years' experience with the remainder having 5 years or more experience of teaching in higher education. 25% of the respondents have been teaching in excess of 20 years in the sector. These figures suggest a healthy mix of young and experienced teaching staff. The general profile has a healthy spread across all age categories.

[207-16] 73% of the overall respondents indicated they have taught on other higher education programs prior to being involved in the BSc. In Product Design, with 27% of staff being introduced to teaching in higher education through the program. Both Arts (25%) and Engineering (50%) respondents had come on board to teach this program as their first HE experience. No Business staff came on board to teach this program as their first HE experience.

[208-16] Over half of the respondents indicated that the nature of their teaching has changed as a consequence of my involvement in the BSc in Product Design. While the research does not interrogate exactly why they perceive changes to have occurred, it is not unreasonable for us to infer that this is a positive aspect of the program. The substantial quality of the program is its inter-disciplinary, cross faculty nature and that this is effecting change on the way staff perceive their teaching. There are also disciplinary differences which are worth

taking account of. Over three quarters (78%) of Engineering respondents indicated that the nature of their teaching had changed, while half (50%) of Arts respondents had a similar experience. However, only 17% of Business respondents felt that their teaching had changed as a consequence of being involved in the BSc. in Product Design. The Business data could once again be interpreted as a condition of the staff perception of their role on the overall program.

[209-16] 68% of respondents have undertaken some form of continuing professional development over the past 5 years. There is little variance between the disciplines regarding this issue and is likely to reflect a growing emphasis being placed on professional development by the institute. Further in-depth research could be undertaken from this data by making a comparison regarding the age profile and engagement in continuing professional development. Analysis could also be made between age profile and discipline orientation. However, it is too detailed for this research at this point.

[210-16] 52% of respondents indicated that where they undertook continuing professional development it was focussed on teaching while 39% of respondents focussed on professional development linked to their discipline area. In the main the discipline breakdown was similar between the disciplines but with a slightly greater emphasis in Arts on both Discipline Area (43%) and Teaching (57%) than Engineering and Business who both indicated other areas of cpd in the mix. From the data set provided further investigation could be made of continuing professional focussed on both discipline or teaching, however, this is too detailed for the current research.

[211-16] 45% of respondents indicated that they had undertaken 'training' or 'studies' which focussed on 'teaching practice'. This was highest in Engineering at 57%, followed by Arts at 50% and Business at 20%.

[212-16] 90% of respondents indicated that they feel that this helped in developing your professional identity as an academic. To emphasise the significance of the response, 70% indicated it helped a lot and 20% that it helped somewhat. The only dissent emerged from within arts where 25% of the Arts respondents indicated that it helped them very little.

[213-16] Where respondents indicated they had not undertaken 'training' or 'studies' which focussed on teaching practice 40% indicated it would make a contribution to their

development of professional identity as an academic. However 47% were uncertain and 13% indicated it would contribute very little to their professional identity as an academic.

[231-18] On an overall analysis of the appropriate qualities of a product designer, over half (52.4%) regarded the need for both technical and creative skills in combination. Less than 19% placed an emphasis on a predominantly technical orientation. Almost 29% placed an emphasis on the predominantly creative orientation. In terms of discipline breakdown, two-thirds of Arts respondents (65%) emphasised the need for both technical and creative skills to be combined, while approximately 45% of Engineering and Business respondents perceived the combination qualities. This data could be interpreted to suggest that Arts respondents have a more natural affinity towards a multi-disciplinary collaborative approach to the product design discourse and see the product designer as a 'product' of that frame of reference. Both Engineering and Business still retain a stronger discipline orientation. However, what is also emerging from this data is that the recognition of the importance of technical or creative qualities are not aligned with disciplines and that in the main staff have a collaborative disposition in favour of the collaborative benefits of cross discipline engagement.

## **APPENDIX K - Qualitative Data - Staff Questionnaire Results**

### **Data from Research Questionnaire [b].**

#### **What are the main barriers to the development of the BSc Product Design . B 4 (a)**

Could be more consensus among staff and students as to what is a product designer. (103A)

Probably too much emphasis on the pure engineering aspects of the course. (105A)

In certain cases, there seems to be a lack of willingness to change. Change of material, change of structure. (146A)

I am not sufficiently well informed to comment. (149A)

Primarily, the course still needs to decide what it is. You might best approach this by asking what kind of students does one want to attract and graduate. Whilst they'll always be a wide range of individuals, you need some sort of idea, and I always felt this was lacking. At the moment you have too many engineers who think design is an add-on, to make something palatable, to sugar the pill. (154A)

Multi-site is an issue, as it is difficult for staff to meet up in an informal manner. Good for students because they are exposed to different academic environments. Its benefit to students is possibly why it has prevailed. However, some modules have shifted to accommodate better communications between staff. Differences in cultures are evident but slowly breaking down. Better communications would help this. (157A)

Lack of design studio space is a bit of a problem.(160A)

No contact with other lecturers; module descriptors (161A)

I feel that all faculties being based in one location (ie Grangegorman) would help to create a more collegiate atmosphere between staff and students alike. Our historical 'silo' approach is no longer appropriate but it is too embedded to change in the near future. (109B)

Individual lecturers input time; DIT policy; Leadership(112B)

Locations on different sites; limited contacts; different philosophies. (134B)

From memory I felt more students were attracted by/talented in the art/design side than the technical side. (141B)

Unsure. (106E)

Poor facilities for the students. No private space to work from, and store and reflect on their daily work. Nowhere to hang up visual sketches or mechanical print outs, or display their scale mock-ups! (110E)

Development is difficult when there isn't even funding to deliver the current course as per the Course Document; Insufficient contact hours with students to enable real depth in both single and collaborative disciplines. (115E)

I am unable to offer clear concise responses to questions a-c above due to my level of involvement in the product design course (this might suggest that some staff within departments might well feel like service teachers to the program) (140E)

"Appropriate levels of disciplinary and teaching knowledge and abilities among staff teaching on the programme. Staff and management must be committed to the betterment of the programme, not just delivering isolated modules". (145E)

"Apathy and lethargy of some lecturers. Lack of strategic strategy for the program. It's doing well but mostly due to the work of a number of good lecturers. That unfortunately can only take us so far. (147E)

Site locations, possibly (153E)

#### **How could improvement be made to the BSc in Product Design. B 4 (b)**

A little more integration, a little more collaboration. Obviously this takes time. Perhaps an away day? (103A)

Better integration between studio work and workshop with better and more direct access to some technical facilities for experimental/retro (secondary) research purposes. Reducing the initial time lag between ideas and results. Allowing students time to modify their results rather than accepting half-baked solutions. Demanding that students devise tests for their ideas before they become too advanced to change. (105A)



I think the students need to have a better idea about who they're up against in industry and a better idea of what they might end up doing in industry. Some work experience placements would be great-even if there was one or two and students had to compete to get them. One possibility to get away from the "jack of all trades" association might be to look at the structure of the RCA masters course. In DIT, by 4th year, students generally have a better grasp, and preference for one of business, design or engineering. It might be useful to consider having tributary focuses in final year projects, where students can concentrate on developing their chosen discipline in a richer way?

I am not sufficiently well informed to comment. (149A)

Much greater collaboration of all 3 strands, from 2nd year on to final year. Leave 1st to building a grounding, after checking that there are no obvious link-ups that will weaken the bedding in process of new knowledge OR examples of staff in different areas teaching the same or very similar material. I strongly feel that before a fuller range of collaborations is introduced, you need to decide what are you trying to create. Greater capability and training of students in model-making and workshop skills – esp. machine shop. Reduce reliance on Rapid Prototyping as answer for everything. (154A)

More contact with colleagues. Needs to be a review of the modules on a continuous basis, particularly looking at the potential synergies across disciplines. Enable and facilitate appropriate ones. (157A)

In short, access to a design studio at least on one full day a week for each year would help. (160A)

Raise the importance of design and integrate the two colleges more. Assignments should correspond to more than one module - there should be constructive alignment. (161A)

It should begin with a one-day workshop for all staff on the programme having to answer the question 'what kind of student do we want leaving this course and what kind of skills and attributes should they possess?' Knowing the end result, the group should then work backwards to agree the subject content and assessments. (109B)

Shared ownership by Business College; greater preparation for exit to job hunting; more collaborative work. (112B)

As in all programmes. (134B)

Marketing of the programme. (141B)

More specific engineering modules. More business integrated into subjects. More opportunities after college. (106E).

Proper facilities. (110E)

Development is difficult when there isn't even funding to deliver the current course as per the Course Document; Insufficient contact hours with students to enable real depth in both single and collaborative disciplines. (115E)

I am unable to offer clear concise responses to questions a-c above due to my level of involvement in the product design course (this might suggest that some staff within departments might well feel like service teachers to the program) (140E)

Collaboration between disciplines could be encouraged by having lecturers from various disciplines co-operating on the same projects. Pilot project with lecturer in Aungier St showed how new learning technologies can be used to improve this. Peer learning must be encouraged and facilitated. New studio space has greatly improved opportunities for students to work together. (145E)

We need a 3 or 5 year plan that gives the program and the lecturers a clear direction in which we see the program going. We need a committee to look at competitions and to decide which ones would be best for the students and importantly for the prestige of the program. We need to look at the possibilities for research. We need to develop a masters program or possibly a series of masters modules that could link in with another masters program in the institute. (147E)

None specific the course has evolved gradually from its inception and will continue to do so. (153E)

**What are the major strengths of the BSc in Product Design. B 4 (c)**

The fact that three faculties are combining to deliver a single programme is a positive development for DIT and should be used to encourage further collaborative programmes. (109B)

Small class sizes; dedicated core of lecturers/managers; In the main engaged students. (112B)

Unique course and final year students designs are excellent. (130B)

Bright students; mix of subjects.(134B)

Interdisciplinary Nature. (141B)

The facilities they have available to them. (106E)

Strong Student/Staff morale due to difficult work conditions!(110E)

Interaction between schools. Students really benefit from day one in understanding that real successful products are complex achievements. (115E)

I am unable to offer clear concise responses to questions a-c above due to my level of involvement in the product design course (this might suggest that some staff within departments might well feel like service teachers to the program)(140E)

"At its strongest, it produces well rounded graduates with strengths in engineering, design and business and the ability to leverage these strengths together to generate innovative products. The weaker students can tend to “fall between stools” and leave without a strong grasp of any of the subject areas, much less an extended abstract level of understanding of the area of design.( 145E)

The program has a very solid base in each of the disciplines. The disciplines modules are taught by lecturers who have expertise in the module content. The cross section of content of the program produces a graduate that has a well-balanced and large range of skills. ( 147E)

The course subject diversity, the skills of the lecturer staff. (153E)