“An Exploration of The Barriers To Independent Study and Learning In First Year Undergraduate Engineering Students”

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Title

“An exploration of the barriers to independent study and learning in first year undergraduate engineering students”

Robert Morris

M.A. (Third Level Education) June 2011
Declaration

I hereby declare that the material which is submitted in this thesis towards the award of Masters (M.A.) in Third Level Education, is entirely my own work and has not been submitted for any academic assessment other than part-fulfilment of the above named award.

The material contained in this thesis may be used by future students on condition that the source is acknowledged in full.

Signed..............................................................

Date.................................................................
Abstract

This mixed method case study was based in the Institute of Technology and was conducted with the co-operation of four experienced lecturers of engineering and three groups of first year undergraduate engineering students. The main aim of the research was to identify factors which constitute barriers to the independent study and learning of first year engineering students.

A large proportion of first year engineering students do not return to college for the second year of their programmes. Many reasons for this are identified in the research, including the failure to pass assessments and examinations as a result of the lack of independent study and learning. It was necessary for the case study research design to be mixed in method and sequential in nature to best address the complexity of the research question. Qualitative exploratory interviews were conducted with the four experienced lecturers of engineering. The analysis of the data gathered in conjunction with my own personal experiences, and knowledge gathered from a review of the literature served to guide and inform the selection of the questions which were used in a quantitative student survey. This was completed online, and included the “Brief Measure of Learner Autonomy”. This resource provides a numeric value for the student’s learner autonomy. The inclusion of this measure provided a mechanism to explore the relationship between the level of autonomy of the students, their profile and their study habits. The findings of the student’s survey were subjected to quantitative comparative analysis. In order to best meet the aims and objectives of the research and to best represent the significance of these findings they were subsequently subjected to qualitative analysis. Strength was added to the research by revisiting the findings which emerged from the qualitative interviews during the qualitative analysis of the data from student survey. Identified by as barriers to independent study and learning were, the lack of commitment to study by the students, the lack of sound study skills, a low level of learner autonomy in young male with low CAO points on entry, and students working too many hours. The recommendations of this research focus on the need of third level institutes to recognize the importance of sound study skills training.
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# Table of Contents

**Title**

Declaration  
Abstract  
Acknowledgements  
Table of Contents

## Chapter One

**Context**  
1.1 Context of the Research  
   1.1.1 International Context  
1.2 Rational for the Research  
1.3 Aims of the Research  
1.4 Research Objectives  
1.5 The Research Question  
1.6 Research Ethics  
1.7 Overview of the thesis

## Chapter Two

**Literature Review**  
2.1 Introduction  
2.2 Engineering Studies at the DIT  
2.3 The Student Profile  
2.4 Study Skills Training  
2.5 Learner Autonomy  
2.6 Measures of Learner Autonomy  
2.7 Causes of attrition in first year students  
2.8 The first year experience
Chapter Three

Research Design

3.1 Introduction 26
3.2 Overview of the Research Design 26
3.3 Theoretical Perspective 26
3.4 Research Designs 28
   3.4.1 The Qualitative Research Method 28
   3.4.2 The Quantitative Research Method 29
   3.4.3 The Mixed Research Method 29
3.5 Mixed Method research Strategies 30
   3.5.1 Concurrent mixed methods 30
   3.5.2 Transformative mixed methods 30
   3.5.3 Sequential mixed methods 30
3.6 Research strategies 31
   3.6.1 Survey Research 31
   3.6.2 Experimental Research 31
   3.6.3 The Ethnographic Strategy of Inquiry 32
   3.6.4 The Grounded Theory Strategy of Inquiry 32
   3.6.5 Phenomenological Research 32
   3.6.6 Narrative Research 32
   3.6.7 The Case Study Strategy of Inquiry 33
3.7 The Steps of the research process. 34
   3.7.1 Step 1. The Exploratory Interviews. 34
   3.7.2 Step 2. The Analysis of the Qualitative Data. 34
   3.7.3 Step 3. The Students Survey. 34
   3.7.4 Step 4. Analysis of the Students Survey. 35
   3.7.5 Step 5. Presentation and discussion of the findings. 36
# Chapter Four

**Presentation and Discussions of Findings.**

- **4.1 Introduction**
  
- **4.2 Analysis, findings and discussions of the Pre Survey Qualitative data**
  - 4.2.1 Theme 1. The Students Profile
  - 4.2.2 Theme 2. The students level of study skills
  - 4.2.3 Theme 3. The students approaches to individual assessments,
  - 4.2.4 Theme 4. The student’s level of learner autonomy

- **4.3 Presentation and Discussion of the Findings and Analysis of the Student Survey**
  - 4.3.1 Age Related Data.
  - 4.3.2 Gender Related data
  - 4.3.3 Living Arrangements Related Data
  - 4.3.4 Employment related Data
  - 4.3.5 CAO Points related Data
  - 4.3.6 Study Skills and Habits related Data
  - 4.3.7 Approach to Study for Individual Assignments related Data

# Chapter Five

**Conclusions and Recommendations**

- **5.1 Introduction**
- **5.2 Conclusions of the research.**
- **5.3 Recommendations and further research**

**References**

**Table of Figures**

- Fig 1 Age Related Data.
- Fig 2 Gender Related Data.
- Fig 3 Living Arrangements Related Data
- Fig 4 Employment related Data
- Fig 5 CAO Points related Data
Fig 6 Study Skills and Habits related Data 60
Fig 7 Approach to Study for Individual Assignments related Data 61

Appendices

<table>
<thead>
<tr>
<th>Appendix</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appendix 1</td>
<td>Participant Information Sheet</td>
<td>76</td>
</tr>
<tr>
<td>Appendix 2</td>
<td>Participant Consent Sheet</td>
<td>78</td>
</tr>
<tr>
<td>Appendix 3</td>
<td>Measure of Learner Autonomy Scale</td>
<td>79</td>
</tr>
<tr>
<td>Appendix 4</td>
<td>Interview Questions</td>
<td>81</td>
</tr>
<tr>
<td>Appendix 5</td>
<td>Interview No 1 Transcription</td>
<td>83</td>
</tr>
<tr>
<td>Appendix 6</td>
<td>Interview No 2 Transcription</td>
<td>87</td>
</tr>
<tr>
<td>Appendix 7</td>
<td>Interview No 3 Transcription</td>
<td>90</td>
</tr>
<tr>
<td>Appendix 8</td>
<td>Interview No 4 Transcription</td>
<td>94</td>
</tr>
<tr>
<td>Appendix 9</td>
<td>Student Survey</td>
<td>100</td>
</tr>
<tr>
<td>Appendix 10</td>
<td>Student Survey</td>
<td>104</td>
</tr>
</tbody>
</table>
Chapter One

Context

1.1 Context of the Research

As an Assistant Lecturer with the School of Manufacturing and Design Engineering which is part of the College of Engineering and the Built Environment (CoEBE) at the Dublin Institute of Technology (DIT) since January of 2001, I have been engaged in the delivery of modules on undergraduate Mechanical, Product Design, and Building Services Engineering programs. Students are required to complete individual assignments as part of the assessment for these modules. In recent years I have become increasingly concerned about the rising numbers of first year students on these programs who did not complete and submit the individual assignments. Despite offers of support and regular reminders of the deadlines for completion of the work, many of these students simply did not present any work. The consequences of not completing these assignments were highlighted to the students, to no avail. Many educational theorists cite academic difficulties and lack of commitment to study as causes of non completion of first year students, (Yorke & Longden, 2004). As an educator I have a natural curiosity about the reasons why some of these students do not engage in the independent study and learning required for the completion of these assignments.

The education of engineers in Ireland is predominantly provided by the Institutes of Technology and the Universities in conjunction with the Institute of Engineers of Ireland (IEI) which is the professional body representing engineers in Ireland. The present research has been conducted in the Dublin Institute of Technology (DIT) and concerns the individual study and learning of a first year undergraduate engineering students. It was conducted at a time when Ireland was encountering a deep economic recession which had been closely preceded by a period of unprecedented growth. Employment opportunities for engineers in Ireland had been dramatically reduced as a result of the collapse of the construction industry which began early in 2008, however this did not influence on the numbers of people opting to study on engineering programs in Ireland at that time. Statistics provided by the DIT Admissions Office in May of 2011 indicated that, 1005 students registered on fulltime undergraduate engineering programmes
with the Faculty of Engineering and the Faculty of the Built Environment for the academic year 2008/2009. Surprisingly, despite the deepening recession, this number rose to 1072 for the following academic year. By this time the Faculty of Engineering and the Faculty of the Built Environment had combined to form the CoEBE.

The Engineering programmes delivered in the DIT today have their origins in the first Courses in Construction, Civil and Mechanical Engineering, developed in 1905 in the Kevin Street Technical School (Duff et al, 2000). This School was established with funding from public subscription and a grant from the Dublin Corporation in 1887. Its aim was to encourage technical education and to promote home industry. The success of this school prompted the Dublin Corporation to open several other schools which catered to a large variety of disciplines. The Technical Education Committee (TEC) which was set up by Dublin Corporation in 1900 to govern these Schools and to manage technical education in Dublin city. In 1911 the Technical Institute, Bolton Street, which was the first purpose built building in Ireland, for the delivery of technical and technological education, opened its doors. In 1936 the City of Dublin Vocational Educational Committee (CDVEC) was made responsible for the technical Institutes in Dublin which by then included the Municipal School of Music at Chatham Row and the Rutland Square Technical School. Later due to urban rezoning these were to be joined by The Rathmines Technical Institute and Pembroke Technical and Fisheries School in Ringsend. The title of the DIT emerged in 1936 as the name of the board which was assembled to provide academic and organisational oversight and cohesion to the five technical institutes which were later designated as the Dublin Colleges.

The following years saw the DIT expand and develop, always seeking to determine the needs of industry, commerce and business both in Dublin and nationally. It continued to develop educational and training courses in disciplines which previously had not been catered for by other educational institutes. In 1976 in response to the increasing demand for degree places in Irish higher education a partnership agreement was established between the DIT, the CDVEC and the University of Dublin. This presented a higher academic platform for the DIT and heralded the departure from the binary system of higher education in Ireland. In recognition of the outstanding contribution of the DIT to the field of higher education, in 1992 The DIT Act
was passed, this was amended in 1994 and again in 1996. This Act and its amendments provided the DIT with independent certificate, diploma and degree awarding powers. The DIT now offers programmes from degree to PhD level in a wide variety of areas including Building Services, Civil, Communications, Computer, Control, Design, Electrical, Electronics, Environmental, Manufacturing, Mechanical, and Transport Engineering. These programmes are accommodated in the Bolton Street and Kevin Street Campuses.

The majority of those who register on undergraduate whole time engineering programs at the DIT come directly through the Central Applications Office (CAO) from the Irish second level educational system. Under this system attendance is compulsory and students who fail to complete individual assignments subjected to penalties such as detention and additional assignments. From the moment they enter third level education these students are expected to behave as self disciplined, self directed autonomous learners. Many first year students struggle to make this transition. One of the earliest indicators that the student has not adjusted his/her behaviour to meet the demands of academic life is the non completion of individual assessments. Yorke & Longden (2004) argue that academic difficulties and lack of commitment to study as causes of non completion of first year students. Of real concern, and pertaining directly to this research is the fact that figures provided by the student retention office of the DIT indicate that 32% of the students who registered on fulltime undergraduate engineering programmes with the Faculty of Engineering and the Faculty of the Built Environment for the academic year 2008/2009 were not eligible to return for the second year of their program.

This phenomenon which is commonly known as non progression is not unique to the DIT. However it is a matter which merits serious consideration. A report conducted by the Higher Education Authority (HEA) in 2010 entitled “A Study of progression in Higher Education” (Mooney et al, 2010) has revealed that the average for non progression across all of the Irish higher education institutes for the academic year 2008/2009 was 15%. The average for non progression across the all of the Irish Institutes of Technology for that year was 22%. These figures indicate that non completion in the Faculty of Engineering and the Faculty of the Built Environment in the DIT which was at 32% was considerably higher than other third level institutes for that year. Furthermore the statistics provided by the student retention office of the DIT indicate that this figure rose to 39% the following year.
1.1.1 International Context

The causes of non progression and strategies which might be employed to address the phenomenon have been the subject of vast quantities of research by the international social science research community. Works by Yorke & Longden (2004) have provided invaluable guidance and insight to researchers with an interest in this topic. The fact that there is such great interest in the causes of non completion and the improvement of retention of students signals a high level of commitment to the students by education professionals, the institutes they work in and the organisations which governed them. This is reflected in how Becker (1975) views the development of education on an international scale, he suggests that a “human capital” approach has been adopted by many of the world’s governments, this can be summarised as, viewing the success of each economy in terms of the degree to which its labour force is educated.

Professor Vincent Tinto, one of the world foremost researchers of the subject of student retention, while making a presentation titled “Enhancing Student Retention: Lessons learned in the United States” at the National Conference on Student Retention, Dublin (Tinto, 2010) suggested that the United States of America (USA) is currently undergoing a paradigmatic shift in how institutes think about their role in promoting student success. Tinto suggests that Barr & Tagg (1995) capture the essence of this shift by describing it as the movement from an instructional paradigm to a learning paradigm. It involves shifting the focus from how its institutes and educators instruct and teach students to how they can help the students to learn. The learning paradigm being adopted expands the lens of enquiry about student learning, helping to shape the environment and conditions that promote student progression. In the USA, student retention and success rates have been regarded as important measures of performance of state higher education systems and have posed a long standing problem to colleges and universities. (Braxton, 2000). Many states link performance rates with funding mechanisms providing a financial incentive to address the causes of non completion of students. In 2006 the Higher Education Academy funded a large scale review of literature around the first year experience in the UK demonstrating that the issues of attrition and retention of first year students is high on the list of is priorities (Harvey et al, 2006) This review suggests that a large number of first year students in the UK expressed a considerable dislike for the experience they encountered of being taught or instructed rather than having their learning facilitated. This is significant as it relates
directly to the paradigmatic shift described earlier which is perceived by Tinto to be occurring in the USA.

Performance indicators generated by the Higher Education Funding Council of England first became available in 1999. These contained statistics relating to the retention and completion of students in English third level institutes. Whilst this allow intra-institutional benchmarking and a basis for enhancement activity these also led the minister responsible for the sector at the time to express an expectation that institutes which exhibited poor retention rates would make a determined effort to improve them. The practice of linking funding mechanisms to performance indicators is not without its problems. An institute which is concerned with its performance regarding retention may adopt a strategy of enrolling only students whose background suggest they are more likely to succeed. Bourner et al (2001) argue that this could be discriminatory and restrictive for those the institute claim to be extending a welcome. In the long term this could result in the practice of avoidance of the causes of attrition rather than a concerted effort being made to resolve these causes. The work of Kells (1993) resulted in the generation of the wide range of performance indicator systems for the Organisation for Economic Co-operation and Development (OECD). These include completion data for the third level institutes in the OECD countries but unfortunately do not contain retention or attrition figures.

Yorke & Longden (2004) describe the importance of student success in higher education as being “incontestable” no matter what ones stand point is. My stand point is that of an educator who is very aware that most of the student who don’t study enough, end up as an attrition statistic. I have attempted through this research project to identify some of the factors which constitute barriers to the independent study and learning.
1.2 Rationale for the Research.

As mentioned previously, part of my teaching duties includes issuing first year undergraduate engineering students with individual assignments to complete. Concerned about the failure of some students to engage in the independent study and learning required for these relatively short assignments, I decided to engage some of these students in an informal conversation about the issue. They agreed to discuss the issue, but not before being given assurances that the information they provided would not be used against them. Many of the students admitted that,

“If they studied at all, it was only for about two hours per week”.

I was understandably very alarmed by this revelation. First years engineering students studying at the DIT are advised at induction that they will need to study for approximately fifteen hours per week. They are also informed about the study skills classes which are available to them. I decided to discuss this matter with some of my experienced colleagues. They were equally concerned however they were not very surprised. They confirmed that, in their experience

“The lack of commitment to study present in first year students often results in them falling behind and eventually either leaving the program or failing end of year exams”.

They offered a wide range of suggestions as to why some first years don’t study enough. These included unpreparedness of the students, wrong program selection, students having a job, college not being what the students expected and students having their priorities wrong. Also offered as a reason was the idea that some students struggle to make the transition from a second level system where teachers and parents are regarded as being responsible for their discipline and learning, to college life where they themselves are expected to take ownership of this responsibility and to behave as self disciplined self directed learners. The consensus was that the consequences of not completing an individual assignment or “homework” as it is called in the second level system are usually immediate, involve additional work in some cases detention, and generally involves notification of parents or guardians.
Arguably, the consequences of not completing an individual assignment in the third level system are long term, do not involve additional work nor does it involve notification of parents or guardians. Conscious that some first year students need more guidance relating to study than others, and wishing to identify how best to provide this guidance, I became aware that I needed to first identify some of the factors precluding study.

The rationale for the selection of this topic as the subject for this Thesis stems from a desire to learn how to best help these students by identifying, through this study, some of the factors which constitute barriers to their independent study and learning.

1.3 Research Aim
The majority of students who come to study engineering at the DIT, come through the CAO scheme. As mentioned earlier, some of these students struggle to make the transition from the second level system to college. Despite having to familiarise themselves with a new environment and quickly absorb large amounts of information they are expected to behave as self disciplined self directed learners immediately on entering college. These students no longer have the close guidance and supervision which they had in second level. Individual study is often one of the casualties of the process of adapting to college life. Many of these students do not engage in the study and learning required for the completion of individual assessments; this often results in them falling behind and either leaving college or failing end of year examinations. As educators wishing to facilitate the learning of these students we have a responsibility to investigate the causes of this phenomenon so that we can bring our findings to the attention of the students and our colleagues in third level education.
1.4 Research Objectives

The objectives of this research which align with the research aim are as follows:
To identify the factors which constitute barriers to the independent study and learning of a group of first year engineering students by the examination of the relationship between the study habits of these students and,

- aspects of their profile such as age, gender, CAO points level, whether they are living away from home or not, whether they are in employment and if so how much time they spend working.
- whether they have study skills training or not.
- how they approach the independent study and learning required for individual assessments and examinations.
- their level of learner autonomy.

On the basis of this research, it is hoped that recommendations based on the findings may be offered to colleagues in the CoEBE and the DIT student Retention Officer.

1.5 The Research Question

The main question for this study is as follows:

“What are the barriers to independent study and learning in first year undergraduate engineering students?”
1.6 Research Ethics

Those engaged in research in the field social science are bound by a fundamental responsibility to conduct research ethically. Ethical research codes currently employed across a wide range of disciplines have their origins in the Nuremberg Code (1949) which related to the area of biomedical research and were generated to protect the rights human beings from a recurrence of the atrocities conducted during Nazi medical experimentation. The DIT like many other higher educational institutes has elected to form ethics committees which oversee the research activities conducted by its researchers. Ethics committees are charged with the responsibility of ensuring that research is conducted in accordance with recognised ethical codes and principles. Recognised codes for social research include those published by the British Research Ethics Association (BERA) and the British Sociological Association Code of Ethics (BSA). Aware of my responsibility as a researcher it was essential to familiarise oneself with these codes of ethics and the literature relating to how they should be applied. Codes are not rules of conduct. They require the researcher to take each of the principles into account, to interpret the code and to make decisions within the spirit of the code. Although researchers are expected to be independent and objective they are also required to conduct themselves professionally in the pursuit of truth while demonstrating a commitment to discovering and reporting their work as faithfully and honestly as possible. Citing Berg (2001); Punch (2005); & Sieber (1998). Creswell (2009 p88) suggests that,

“Ethical practices involve more than merely following a set of static guidelines, such as those provided by professional associations. Writers need to anticipate and address any ethical dilemmas that may arise in their research. These issues apply to qualitative, quantitative and mixed methods research and to all stages of research.”

Researchers need to be sensitive to the impact their work might have on the subjects of the study and must ensure that participants are not adversely affected by them participating in the research. One of the reference points of social research ethics is informed consent. This was one of the fundamental criterion which was enshrined in the Nuremberg Code (1949) and later by the
Codes of Ethics generated by professional associations in the United Kingdom the United States and elsewhere (M Fitzmaurice, personal communications, 2010). Recognised codes of ethics were adhered to at all stages during the research for this thesis. All of the participants involved in this study provided their consent. The four experienced lecturers who were requested to participate in the interviews were first provided with a Participant Information Sheet (Appendix 1). These confirmed that their identity would be protected and that all information collected during the course of the research would be kept strictly confidential and all data will be anonymised so that individuals or the College/ School could not be recognised. When they confirmed that they were willing to participate they were provided with a Participant Consent Form (Appendix 2) which they completed and signed and dated prior to the commencement of the interview. This form requested them to confirm by initialling a box that they

- had read and understood the Participant Information Sheet and had the opportunity to ask questions about it,
- understood that their participation was voluntary and that they could withdraw at any time without giving a reason, and
- understood that their responses would be anonymised before analysis, and that they gave permission for the use of these anonymised responses by myself and my thesis supervisor.

At the start of the student survey which was completed on-line the participant was presented with the following message.

“Participants should be aware that all information collected in this survey will be kept strictly confidential and all data will be anonymised so that individuals or the College/ School cannot be recognised in it. By completing this survey participants are consenting to the use of the information gathered for educational research purposes.”

They were asked if they had read and understood this message and if they were willing to proceed with the survey.

They confirmed this by selecting the “Yes” option before they could continue with the online survey. If they chose to select the “No” option the survey closed and they were thanked for their time before leaving.
1.7 Overview of the thesis
This thesis is organised into chapters, the contents of which are as follows:

Chapter One
This Chapter introduces the personal, national and international context of the research providing the rationale for conducting the study. The research question and its alignment with the research aims and objectives are detailed. The ethical considerations of the research are also presented.

Chapter Two
This Chapter explores the relevant literature which relates to and informs the issues of attrition and retention in first year students. Literature around the study habits and the learner autonomy of first year students is explored. Learning styles, in particular those which are commonly associated with the study of engineering are explored. Literature relating to initiatives taken to help students to make the transition from the second level to third level system are examined and discussed.

Chapter Three
This Chapter provides a detailed description of the research design for which the sequential mixed research method design has been adopted with the Pragmatist world view providing the theoretical underpinning for the research. The selection of the case study research methodology approach is discussed. The rationale for the selection of the mixed method research methodology is highlighted.

Chapter Four
This Chapter presents the findings which emerged from the pre-survey interviews conducted with experienced lectures, and which emerged from the student survey conducted with the group of first year engineering students. The examination of the analysis of the findings and their relationship to the aims and objectives of research are discussed in detail.
Chapter Five
This Chapter sets out the conclusions of the research and details the researchers recommendations.
Chapter two

Literature Review

2.1 Introduction
This research thesis focused on the study habits of first year undergraduate engineering students. Hart (2005) suggests that the search and review of the literature for a research study is a critical evaluation, analysis and synthesis the knowledge that exists around the research problem. The literature review, not only seeks to explore in detail of all aspects of the research question, it also seeks to uncover gaps in the knowledge that exists about the research problem. The initial stages of a literature review for this study helped to inform the selection of the research design and data collection methodology used. In order to explore all avenues of the literature around the research problem the following main areas were explored.

2.2 Engineering Studies at the DIT
2.3 The Student Profile
2.4 Study Skills Training
2.5 Learner Autonomy
2.6 Measures of Learner Autonomy
2.7 Causes of attrition in first year students
2.8 The first year experience

2.2 Engineering Studies at the DIT
As mentioned in chapter one the DIT had been involved in the education of engineers for over one hundred years. The first Courses in Construction, Civil and Mechanical Engineering, developed in the Kevin Street Technical School (Duff et al, 2000). The DIT has evolved into the largest Institute of Technology in Ireland with over twenty thousand students and over two thousand staff. It now offers programmes form degree to PhD level in a wide variety of areas including Building Services, Civil, Communications, Computer, Control, Design, Electrical, Electronics, Environmental, Manufacturing, Mechanical, and Transport Engineering. These
programmes are accommodated in the Bolton Street and Kevin Street Campuses. Approximately half of the students who study at the DIT are whole time students; the balance is made up of part time, postgraduate, and Apprenticeship students. In 2010 the College of Engineering and the Built Environment (CoEBE) was formed when the Faculty of Engineering and the Faculty of the Built Environment were merged. The CoEBE now has 9 schools through which it offers 26 undergraduate engineering related programs. Of these 12 are honours degree level 8, 12 are ordinary degree level 7 and 2 are higher certificate level 6. The students surveyed as part of the research for this thesis were all from level 7 undergraduate engineering programs. Despite the recession in the Irish economy and the dramatic decline in the Irish construction industry, data provided by the DIT Student Retention Office indicate that for the academic year 2008/2009, 905 students registered on undergraduate engineering programmes with the CoEBE. Of real concern, and part of the rationale for this study is the data that indicates that 303 (33.4%) of these students were not eligible to return for the second year of their programs. Of greater concern is the fact that the data provided indicates that this figure rose to 39% for the following academic year.

This Phenomenon is not unique to the DIT. A study conducted by the Higher Education Authority (HEA) (Mooney et al, 2010) shows that for the academic year 2007/2008 the proportion of first year undergraduate students studying at Irish Institutes of Technology who did not progress to the second year of their programs was 22%. The non progresson figure across all third level institutes in Ireland was 15% (Mooney et al, 2010). Many initiatives have been put in place by higher education institutes to provide support and guidance to at risk first year students. Many institutes have put in place students support services manned by dedicated staff who provide advice and guidance to students on a wide range of issues. In order to establish if independent study and learning suited the learning styles of engineer’s a review of the literature around the learning styles of engineering students was conducted. Felder (1998) discussing learning styles in engineering students suggests that,

- Active learners learn things by working things out or by working with others
- Reflective learners learn by thinking thing through or working alone
- Sensing learners are orientated towards facts and procedures
- Intuitive learners are orientated towards theories
• Visual learners prefer visual presentations of presented material
• Verbal learners prefer written or spoken explanations
• Sequential learners learn in incremental steps and
• Global learners are system thinkers who like to learn in large leaps.

O’Dwyer (2008) examined these learning styles in a group of 35 students studying electrical engineering at the DIT. Using the Index of Learning Styles (ILS) (Felder & Soloman, 1991 as cited in O’Dwyer 2008) which is a 44 item questionnaire with multiple choice answers (2 per question), the findings indicated that there is no single specific learning style that can be attributed to engineering students. The foremost learning styles which emerged in the group were the active and sensing followed by visual and sequential learning styles.

2.3 The Student Profile
The current economic recession and the collapse of the construction industry has not significantly reduced the number of the students who select to study on engineering programs in Ireland (Mooney et al, 2010). As indicated earlier the CoEBE in the DIT offers 26 engineering related programs. Currently Approximately 90% of the students who come to study on these programmes are school leavers coming through the CAO scheme. The balance is made up of students progressing from apprentice programs, non national students and older students who are returning to education after a period of absence. The number of non national students enrolling is on the rise in recent years as a result of changing immigration policies. Many students and parents of school leaving students indicate that the higher number of weekly class contact hours (25), the applied nature of the teaching and learning combined with an excellent reputation is what attracts them to study at the DIT. The reasons these students decide to pursue a primary degree in engineering are many and varied. Many demonstrate a long standing inherent interest in the subject. They express a deep interest in how things work and how things are designed and made. Currently there is considerable interest in the study of environmental and energy related areas of engineering. The constantly changing nature of engineering and the possibilities of exiting career opportunities both nationally and internationally are also cited as reasons for the selection. The number of females seeking to study engineering continues to rise as many third
level institutes actively seek to attract females in an effort to address the gender imbalance in engineering. Many of these students have now accepted as a given the fact that in highly probability that they will need to seek employment outside of Ireland. In order to establish if independent study and learning suited the learning styles of engineer’s a review of the literature around the learning styles of engineering students was conducted.

2.4 Study Skills Training

Of particular interest to this study is the provision of study skills training. For many years teachers and lectures have discussed the value of study skills (Gibbs et al, 1994). Study skills training is provided as a small part of professional development modules on only seven of the twenty six programmes on offer from the CoEBE. Communications modules are delivered in 5 other programs and these do have some content which help students with their studies, such as note taking and time management. However the main focus of the communications modules is on key or soft skills such as teamwork, conducting meetings, IT skills and making presentations. DIT students can however avail of interactive online study skills training which is provided through the DIT website by the Student Services Department. First year students are made aware of this service during induction when they first enter the college. In addition to study skills training this service provides guidance, advice and basic instruction on the use of computers, email, web-courses, academic writing and reflecting on learning. Also available to the students is the Handbook for Higher Education Study. (DIT, 2009). This is a downloadable PDF version of the services available online.

Many of the other third level institutes in Ireland provide similar support services for their students. Many lecturers however assume that their students have already acquired study skills such as note taking, time management and problem solving, at some time during their second level education, (Shoemaker, 2006). Some of the students who come directly from the Irish second level schools system have been provided with study skills training in preparation for the Leaving Certificate Examination (LCE). However the provision of this training is not a compulsory requirement of second level schools.
Peer mentoring has been adopted on a small number of programs in an attempt to help first year students with a range of issues including study skills needs. Boud (2001) suggests that there are many forms of Peer Mentoring spanning from the traditional model where senior students provide guidance and tuition to junior students, to the more creative learning cells such where pairs of junior students team up to help each other. Well managed peer mentoring schemes can be quite successful as students learn a great deal from explaining their ideas with others. Students can also develop skills such as the organisation and planning of activities. Peer mentoring goes beyond independent learning to the practice of mutual learning. Kail (1983) argues that if students work together only during class, then at the end of the semester when the class has disbanded there will be no opportunity to develop the group relationship. Whereas if mentoring is employed quite often the relation which has developed over the semester is sustained by the parties involved. Although peer mentoring is beneficial to the students in the long term, it does require a considerable amount commitment. Training is required for both the students and the college staff. Strict ethical guidelines must to be adhered to by everyone involved. Mentoring students must be willing to volunteer their spare time and often there are more students seeking help than students willing to volunteer it. At times the pairings don’t work out and the process of matching participants needs to be repeated. (Tiberius, 1999 as cited in Boud et al 2001).

Also available to students at the DIT are a small number of short study skills training sessions however these are run at lunchtimes in only 2 of the 11 DIT campus locations, Cathal Brugha Street and Aungier Street. For many students attending these sessions would involve travelling considerable distances and possibly missing lectures as a result. The most common solution offered to first year undergraduate students whose programs don’t include study skills modules is the suggestion that they should partake of study skills training through the self help online resources where they must teach themselves these essential skills. This requires the students to behave in a self directed autonomous manner, taking ownership of their learning need. Many students entering college have not yet made the transition from the extrinsic learning model employed in second level which focuses the responsibility for the students learning on the teachers and parents to the more intrinsic model employed in third level education where student must take ownership of their own learning Costello & Russell (2002). Learner autonomy and the first year experience will be revisited later in this review. Many third level institutes make claims
of taking a holistic approach to education, being learner focussed and being committed to aiding students to learning, yet they fail to recognise that sound study skills are an essential element of the process of helping student to learn how to learn. It has been recognised by industry that study skills is one of the skills that mirror many of the skills students require for their careers such as time management, presentation skills, communication skills, and task management skills (Shoemaker, 2006).

2.5 Learner Autonomy

The earliest references to the idea of autonomy can be traced to ancient Greece where it was referred to in a political context. It referred to the property of a state to be self ruling or independent. Riesman (1950) as cited in (Boud, 1981). made reference to autonomy when identifying the distinction between the three orientations of direction, self direction, other-direction and inner direction. He argued that the autonomous persons must be free not only from direction external to themselves but also to their own inner compulsions and rigidities. Jackins (1965) as cited in (Boud, 1981). argued that autonomy is more than acting on one’s own. It reflects responsiveness to ones environment not patterned by stereotypical responses from ones past but based on ones creative and unique responses to situations. The use of the word “autonomy” from an educational perspective refers to the capacity of an individual to be an independent agent, not governed by others (Boud, 1981). Prominent educators have long promoted the concept of encouraging students to become more autonomous in their learning.

Knowles (1980) argued that there are distinct differences between the education of adults and children. The term “pedagogy” refers to the education of children whereas the term “andragogy” which was popularized by Knowles has become the term often used for the education of adults. Knowles argued the nurturing of learner autonomy in students one of the fundamental elements of andragogy. The work of Knowles on the theory on andragogy was later critiqued by Jarvis (1987) Davenport (1993) and Tennant (1996) as cited in (Smith, 2002). Here it was argued that although Knowles was a leader in his field and was responsible for many firsts. He was the first to chart of the rise in adult education in the United States, the first to development of a statement of informal education practice, and the first, through the concept of andragogy to endeavour to
develop a comprehensive theory of adult education. His critics claimed that much of his theory and practice embodied his own value system and lacked a critical edge.

Although there is distinct a lack of a generally agreed definition of learner autonomy much of the literature discusses it without actually defining it (Macaskill & Taylor 2010). Merriam & Caffarella (1999); Ponton (1999) as cited in (Macaskill & Taylor 2010) described learner autonomy as a psychological characteristic of individuals able to direct their learning and declared it to be an essential characteristic of adult learners. Ponton, Carr & Confessone (2000) while focussing on the analysis of psychological characteristics of learner autonomy conclude that the associated conceptualisation is essential and sufficient to explain what Long (1998) as cited in Ponton, Carr & Confessone (2000) termed as self directed learning. This, they suggest, is now labelled as autonomous learning or independent learning. Fazey & Fazey (2001) explored autonomy related psychological characteristics of first year undergraduates registered in a Welsh college. The students displayed a positive inclination towards autonomy however they showed a lack of confidence in their abilities to cope with the demands of higher education. There would be merit in the testing of the student’s autonomous learning using a formative assessment. This might instil confidence in the students.

2.6 Measures of Learner Autonomy

To investigate the possibility of measuring the level of learner autonomy of the participants in this research study a review of the literature around measures of learner autonomy was conducted. Since the widespread recognition of the importance of learner autonomy most of the research around it has aimed at its facilitation. Merriam & Caffarella (1999) highlighted the lack of psychometrically sound measures of learner autonomy. The scale developed by Guglielmino (1977) called “The Self Directed Learning Scale” was the most widely used for many years until Candy (1991); Field (1991); Straka & Hinz (1996) highlighted problems with its validity, as cited by Macaskill, Taylor (2010). Fisher, King & Tague (2001) developed an alternative to Guglielmino’s scale called “The Self-Directed Learning Readiness Scale for Nursing Education”. Many considered this scale to have too many questions (forty) and believed its closeness to the field of nursing education made unsuitable for use on students from other disciplines.
Believing that there was a need for a shorter more flexible measure of learner autonomy, Macaskill & Taylor 2010, who were members of the Psychology Research Group in Sheffield Hallum University in the United Kingdom, set about developing “The Brief Measure of Learner Autonomy in University Students”. Their first study resulted in the development a questionnaire which presented the participants with fourteen Statements each with a five optional answers from “not at all like me” to very like me”. Each of the answers was given a predetermined weighting. The measure for each participant was calculated using a five point Likert scale. The first trial of the measure was completed by two hundred and fourteen first year psychology students. The validation of the measure which was aided by contributions from four lecturers with experience in learner autonomy ultimately resulted in the recommendation that the number of statements be reduced to twelve. With seven of these labelled “Independence of Learning” and the other five to be labelled “Study habits”, it provided the facility to establish a measure specific to these areas of learner autonomy in addition to an overall scale. The revisions were made and the second trial was completed by one hundred and seventy two similar participants. The validation process was repeated, the internal reliability was confirmed and this time the concurrent validity of the scale was measured against the “The Self-Directed Learning Readiness Scale for Nursing Education” mentioned earlier. The results were found to be satisfactory on all fronts suggesting that this measure could be of use to educational researchers. Macaskill & Taylor (2010) had succeeded in the development of a brief psychometrically sound measure of learner autonomy which they titled The Measure of Learner Autonomy (MLA) (Appendix 3).

2.7 Causes of Attrition in First Year

Research tells us that there are many factors which negatively affect the performance of first year students; not least of these is a lack of engagement in independent study and learning. Poor performance on early assessments is usually the first indication that some students are not studying enough. The research around the reasons for poor performance in first years is dwarfed in comparison to the research conducted around the reasons for the withdrawal and failure of first year students. Many would argue that the reasons for not studying and the reasons for withdrawing are quite often the same. Vast quantities of research aimed at addressing the phenomenon of non progression has been conducted by the international social science research
community. Many large scale studies have been conducted providing invaluable guidance and insight to researchers with an interest in this topic. Tinto (1975) argues that the academic and social arenas are two main areas around which students focus their goals for, and expectations of, college. Tinto’s Integration Model Tinto (1993) is based on the theory that the failure of first year students to integrate into either the social or academic communities in college can often cause them to re-evaluate the goals and expectations they had set for college life. This often results in them withdrawing from college. It is widely accepted that Tinto’s work and the research around it resulted in the acknowledgement by third level institutions worldwide that there is a need to ensure that a suitable blend of academic and social experience are accessible to not just first year students, but all students. Seeking to develop Tinto’s model further Braxton et al (2000) explored different learning styles in an attempt to identify those which positively influenced social integration in first year students. The study identified Active learning as being the style which encouraged social the most. Braxton & Hirchy (2004) as cited in Yorke & Longden (2004) conducted a study of the commitment and integrity of Institutions which contributed considerably to the recognition of the value and importance of the actions of teachers and administration staff to mission and values of their institute. This study resulted in the greater Institutional commitment to student welfare and to the support of risk first year students.

Yorke & Longden (2004) sought to widen the research around the reasons for first year attrition. They argued that failure to integration into college life was only one of a wide range of reasons for the withdrawal of first year students. Aided by contributions from some of the world’s foremost educational researchers they conducted a comprehensive international study of the causes of non-completion of third level students higher. This work examined studies conducted in the United Kingdom, Australia, South Africa and the United States.

For the purpose of this review the focus was placed on two large scale studies conducted in the United Kingdom. In an attempt to fully understand the student’s reasons for leaving, Yorke, (1999) obtained 2151 responses to a tick box survey of withdrawn students. Davies & Elias (2003) obtained comments from 1510 withdrawn students. Yorke’s study found that there were six main reasons given by students for leaving their programs.

- Wrong choice of field of study.
• Academic difficulties
• Financial Problems
• Unhappiness with the social environment
• Dissatisfaction with the institutional Provision

Davies & Elias study found five main reasons
• Wrong choice of course
• Financial problems
• Personal problems
• Academic difficulties
• Wrong choice of institution

Of particular interest to this thesis are the reasons given which might also be reasons for the non engagement in independent study and learning. The data gathered which related to academic difficulties, was of particular interest. Nearly one in three of the ex-students surveyed by Yorke & Longden (2004) had been influenced in their decision to leave by lack of academic progress. They had either failed assessments or had not taken them out of fear of not passing them. Inability to cope with the workload and lack of study skills was cited as contributing to the problem and the decision to leave. Many indicated that they experienced stress related to the program. Haning et al, (2002) suggests that the provision of study skills tutorials for a group of at risk first year science majors resulted in better final grades than a control group.
Harvey et al (2006) conducted an in-depth study and literature review of the research around the first year experience. The study focussed on the research conducted on the topic examining over 750 publications and over 200 institutional grey items generated by third level institutes in the United Kingdom. This included reviews of the work of many of the key researchers mentioned earlier. The findings suggested a contradiction to Tinto’s view that the factors which influence performance and persistence in first year students are not based on a simple integration variables and retention, and that non completion of first year students is a complex combination of student characteristics , external pressures and institution related factors.
Rickinson & Rutherford (1995) highlighted the importance of academic and emotional preparedness for the transition to higher education. Many would argue that most second level schools put more emphasis on with getting their students accepted into college than they put on preparing them for type of academic demands that will be made on them when they get there.
2.8 The first year experience

As mentioned earlier the main focus of the research for this thesis is to attempt to identify some of the factors which constitute barriers to the independent learning in first year students. It would not be possible to achieve this aim without first investigating the first year experience. The majority of the students entering first year come directly from the second level system. They must learn quickly to make the transition from a system where they are closely supervised to one where they must find their own way. Often they find themselves in an unfamiliar place surrounded by people they don’t know (Harvey et al, 2006). Some struggle to find the confidence to ask for help. For many young people college can seem a very large and hostile environment. Most colleges will ensure that for the first few days there are plenty of volunteers, usually 2nd or 3rd year strategically positioned to meet, greet and provide guidance to newcomers. However many of these students arrive unprepared to meet the academics demands of third level education (Costello & Russell, 2002). In the area of engineering education, mathematical unpreparedness has been identified as an issue of serious concern (Hurley & Stynes 1986; O’Donoghue, 1999; as cited in Gill & O’Donohoe et al, 2006). Many colleges have set up drop-in type mathematics support centres which provide non judgemental, flexible subject specific support. An examination of the relationship between mathematical performance in the LCE and non progression indicated that a close link between low scores in mathematics and non progression of students on engineering programs. (Moore et al, 2010). As mentioned earlier most of these students come from a second level system which has a completely different approach to teaching learning and assessment. This requires the student to be able to adapt to changes quickly and to take responsibility for their own leaning. Mc Innis (2003) suggests that the paths between second and third level at times are not well matched.

Yorke & Longden (2008) tells us that the majority of students who leave first year leave have left by the end of the first semester. It is fair to conclude that the early experiences of these students have a significant influence on whether or not they will stay at college. Transitional issues or factors which contribute to student attrition which can be related directly to the early experiences of these students are, unpreparedness, unawareness of the challenges, lack of
commitment and or integration and poor attendance. (Harvey et al, 2006). If students are having an unpleasant experience in college in the early stages they are likely to stay away. This has the effect of compounding the problems encountered originally and makes them more difficult to confront (Davies & Elias 2003). Yorke & Longden (2008) conducted a large scale research project on behalf of the Higher Education Authority in the United Kingdom aimed at attempting to capture the first year student experience. The study was conducted in two phases across 23 varied third level institutes. The first phase was conducted in March of 2006. This involved surveying first year undergraduate students studying on whole time programs enquiring about their experiences in college up to that time. The second phase, which was conducted in the spring of 2007, involved re-surveying the remaining students who had participated in the first phase. Some the students who had left were also surveyed. Seven thousand one hundred and nine usable responses were received for the first phase. The findings indicated that the majority of the sample found the first year experience to have been good in respect of teaching and learning and indicating that the induction programs run by the colleges had been an invaluable source of guidance and information. However approximately one third of the sample indicated that they found the academic demand to be higher than they had anticipated and over half of these considered leaving college as a result. The number of usable responses to the second phase was four hundred and sixty two. Of particular interest here are the forty four submissions completed by students who had left their programs. The findings that emerged from the analysis of these submissions indicated that younger students (aged less than twenty one years on enrolment) cited wrong program choice and lack of academic progress more frequently than older students. Younger students experienced more difficulty making friends and dealing with homesickness than older students. It is significant to note that in Ireland the average age of students entering first year is nineteen years (Mooney et al, 2010). Students in this group who were in employment and were working more than 12 hours per week often cited financial problems and the demands of employment as reasons for leaving. Contrary to this Long et al, (2006) as cited in Yorke and Longden (2008) indicated that working up to nineteen hours per had a negligible impact on attrition in first year students in an Australian University, however if the number of hours went any higher there was a significant influence on attrition. The views about whether or not students are negatively affected academically by being in employment are mixed. Curtis & Sham (2002) suggest that students missing lectures due to being in employment results in the lower
assessment scores, however the students do benefit the experience of working by developing skills, greater understanding of the world of business and an increase in confidence. Choy (2002) shows that students who worked more than fifteen hours per week, had a lower persistence rates. Working part time on Campus for the entire first year in college resulted in significantly higher retention and higher academic achievement. The impact of the student being in employment is discussed further in the next section.
Chapter Three

Research Design

3.1 Introduction

This chapter details the research design, strategy of enquiry, and data collection methods adopted for this thesis. The grounds for their selection are explained in detail. The theoretical perspective which provided the underpinning for the research is also highlighted.

3.2 Overview of the Research Design

The sequential mixed research method design was selected as the most suitable for this thesis. The Pragmatic worldview provided the theoretical underpinning for the research for which a case study strategy of enquiry was employed. For the first stage of this research, the qualitative stage was a series of four exploratory interviews with experienced lecturers of engineering. These interviews along with a study of the literature and my experiences as an educator served to guide and inform questions which were included in the second stage of the study, a quantitative student survey.

3.3 Theoretical Perspective

Prior to embarking on the process of selecting a research design for this project it was necessary to engage in some philosophical self study. The preparation for engagement in research and the selection of an effective research design requires the researcher to make explicit the larger philosophical ideas they espouse (Creswell 2009). The beliefs, experience, skills and knowledge of the researcher are central to the process of conducting research studies. Crotty (1998) argues that the researcher brings to the research process their own lens of enquiry or philosophical worldview which is formed from their perceptions of the world around them, their skills and their understanding of knowledge.
Ones philosophical worldview is commonly termed ones “epistemology” (Crotty 1998) or “paradigm” (Lincoln & Guba 2000) and is defined as,

“A basic set of beliefs that guide action” (Guba 1990 pg 17)

To accurately establish ones worldview one must undertake a two part exercise, starting with a review of the literature on the subject, followed by an exercise in self study and reflection. The worldviews explored were the Social Constructivist, the Social Advocacy/Participatory, the Postpositivist, and the Pragmatist worldviews. Having completed this task I concluded that my problem-centred, real-world practice approach to addressing problems aligns distinctly with the characteristics and positionality of one with a Pragmatic worldview. Pragmatism stems from the work of Dewey, Mead, James and Peirce and was explored further by (Rorty 1990; Murphy 1990; Patton 1990; & Cheeryholmes 1992) as cited in Creswell (2009). (Creswell, 2009) suggests that Pragmatism arises out of actions, situations and consequences rather than previously identified conditions. Instead of focusing on research methods from the outset the predisposition of the pragmatist worldview places the emphasis on the research question.

“Pragmatists focus on the research question and allow it to inform the procedures, methods and techniques of the research that best meet their needs and purposes.”
(Creswell, 2009 p11).

This requires engagement in philosophical assumption and ultimately results in the consideration of all possible methodologies available in seeking to best meet the aims and objectives of the study being carried out. Researchers with a pragmatic worldview enjoy the freedom of choice in the selection of methods to be utilised in the collection and analysis of the research data. Both qualitative and quantitative methods are often used in a mixed approach or singularly in isolation to the other. When mixed, the methods can be conducted in sequence or simultaneously.
Discussing the Pragmatist worldview as a philosophical underpinning for mixed methods studies, Thashakkori & Teddlie (1998); Morgan (2007) and Patton (1990) convey,

“Its importance for focusing on the research problem in social science research and then using pluralistic approached to derive knowledge about the problem”.

(Cited in Creswel, 2009 pg10).

Having firmly established mine as being a Pragmatic worldview the process of selecting a research design could commence. As mentioned earlier researchers with a Pragmatic worldview place the emphasis on the research problem itself, allowing its needs to dictate the research design and methodologies. An investigation into the literature around qualitative, quantitative and mixed methods research designs was necessary.

### 3.4 Research Designs

#### 3.4.1 The Qualitative Research Method

The qualitative research method involves the collection, interpretation and analysis of subjective data such as what people do, feel or say (Schwandt, 2007). In this method, individual in-depth interviews and focus groups are employed with the aim of gathering the opinions and feelings of the participants. The data is subjected to a process of interpretation where the researcher endeavours to extract the meanings or understanding of the participant’s attribute to a specific social or human problem (Denzin, 2005). The analysis of this data requires its content to be categorized into common elements so that emerging themes can be identified. The findings of qualitative research are informed by themes that emerge, and the consideration of the significance of these themes. Qualitative research by its nature can be time consuming and as such is most suitable when researching smaller numbers of participants. The research for this thesis would benefit from the engagement in a number of qualitative interviews however qualitative research alone would not satisfy all of the needs of the study.
3.4.2 The Quantitative Research Method

The quantitative research method uses the process of counting and measuring of predominantly hard objective data in its approach. This method can be used on large or small groups to test objective theory by the examination of variables and making comparisons between these variables (Creswell, 2009). Although questionnaires are sometimes used in the quantitative research method the participants are predominantly provided with a limited number of predetermined response options so that the data can be measured quantifiably. Instruments are often used for collection and statistical analysis of quantitative research data. A quantitative student survey would enhance this study by providing a mechanism for the collection of a large amount of objective data from a manageably sized sample group of between forty and seventy providing considerable breadth to the study. The tools mentioned earlier could be used for the data analysis. However a purely quantitative research design would not meet the aims and outcomes of the research for this thesis.

3.4.3 The Mixed Research Method

The mixed methods research approach combines both qualitative and quantitative methods as they have been described earlier and is often selected when the researcher is not satisfied that the qualitative or quantitative methods alone are fit for the purpose of addressing the needs of the research question. Its origins lie in Campbell and Fisk’s study of the validity of psychological traits conducted in 1959. With encouragement, other researchers followed suit. Seiber (1973) adopted a mixed methods approach when conducting field studies. He combined qualitative research methods employed for interviews and observations with quantitative methods employed for conducting surveys. Being concerned with the possibility that the biases of some researcher towards one or the other method may negatively influence the research process, Jick (1979) as cited in (Creswell, 2009) developed the practice of triangulating data sources as a means of cross checking the validity of the data from both methods. As time passed the mixed method approach became accepted as research design in its own right. This approach aligns well with the “fit for purpose” approach favoured by researchers with a Pragmatic worldview. Believing that the research question for this thesis would be best answered by a combination of a qualitative
element, such as exploratory interviews with experienced lecturers followed by a quantitative element, such as a student survey I concluded that the mixed methods research approach was the most suitable method for this project. The mixed method approach provides flexibility which is not present in the other research methods. Tashakkori & Teddlie (1998) indicate that, the results from one method can help identify participants to study or questions to ask for the other method.

3.5 Mixed Method research Strategies
There are three strategies generally employed when using the mixed methods research design.

3.5.1 Concurrent mixed methods
This strategy involves the simultaneous collection of both types of data and the merging of data from both quantitative and qualitative research in an attempt to present a thorough analysis of the research problem. This approach was deemed to be unsuitable for this project as data from the qualitative element was required to inform questions in the quantitative element. And as such it would need to be collected in advance of the later to allow time for the careful consideration and selection of relevant questions for the student survey.

3.5.2 Transformative mixed methods.
This strategy uses theoretical lenses or perspectives, for example those relating to ethnicity, race, class and gender to guide the selection of the order in which the qualitative and quantitative research is conducted. Within these lenses the data collection method may be sequential or concurrent. Creswell (2009). As this type of approach was not being adopted for this research this strategy was eliminated as an option.

3.5.3 Sequential mixed methods.
The design lends itself well to the requirements of the research problem allowing the combination of both qualitative and quantitative forms of research to be employed in the sequence required. Creswell, Plano Clarke (2007) indicate that the qualitative and quantitative research data collection can be carried out in sequence or simultaneously, however the analysis of the data gathered using both methods needs to be carried out in tandem so that the overall
strength of a study is greater than either the qualitative or quantitative research alone. (Creswell, Plano Clarke, 2007).

As the data needed to be collected in the order detailed earlier the sequential mixed research method was selected as the most suitable tool for the collection of the research data. Creswell (2009p18) suggests that,

“Qualitative and quantitative research data collection can be carried out in sequence or simultaneously”.

3.6 Research strategies.
While engaging in the process of the selection of a research design and strategy of enquiry for a research study the researcher must regularly return to the research question and the problems it presents. Lack of engagement in independent study and learning by students is the central focus of the research for this thesis. To truly ensure that the most suitable overall strategy of enquiry to investigate this phenomenon was selected it was necessary to conduct an exploration of the strategies used not only in the mixed methods design but also in both the qualitative and quantitative research designs.

3.6.1 Survey Research
The function of survey research is to provide generalisations about a population by conducting and analysing quantitative data from a sample of that population. Numeric descriptions of trends, opinions and attitudes are generated using structured interviews and questionnaires (Babbie, 1990).

3.6.2 Experimental Research
Experimental research as a strategy attempts to establish if a specific treatment influences an outcome. It examines the effect of subjecting a selected group or single subjects to a specific treatment. Comparisons are made between data gathered from two sources, one which has been subjected to the treatment and one which hasn’t, (Keppel 1991).
3.6.3 The Ethnographic Strategy of Inquiry
Ethnography as a strategy of inquiry is the prolonged study of a cultural group in its natural setting. Interviews and observation are used to collect data. The nature of the collection of the data requires it to be flexible so that it can be conducted in the real life field setting. (LeCompte & Schensul 1999).

3.6.4 The Grounded Theory Strategy of Inquiry
This strategy of enquiry requires the researcher to derive an abstract theory of a process or action which is grounded in the views of different groups of participants. This process is known as theoretical sampling. Periodic comparisons are made between the data gathered from these groups. The data is collected at multiple stages throughout the research project and is subjected to ongoing refinement and interrelation of information categories. This process is intended to maximise the similarities and differences between the information (Charmaz, 2006; Strauss & Corbin, 1990).

3.6.5 Phenomenological Research
In addition to being a strategy of inquiry phenomenology is also a philosophy as it requires an understanding of the lived experience. For the researcher the process of engagement in phenomenological research is an exercise in attempting to identify the human experiences about a phenomenon from the descriptions given by the participants. This involves studying small numbers of participants through extensive and prolonged engagement while attempting to identify patterns and relationships of meaning (Moustakas, 1994). The process requires the researcher to set aside his or her experiences in order to understand those of the participants. (Nieswiadomy, 1993)

3.6.6 Narrative Research
As the name suggests the narrative research strategy revolves around the study of the lives and life stories of individuals. Participants are required to provide the researcher with stories about their life and experiences. These are often retold by the researcher in the form of chronological
narrative which is complimented by the analytical observations of the researcher (Clandinin & Connelly 2000).

3.6.7 The Case Study Strategy of Inquiry

The Case Study strategy of enquiry involves an in-depth exploration of a process, event, or phenomenon. This exploration is bounded by time activity and uses a variety of data collection procedures. Case studies are often conducted over a sustained period of time, (Stake, 1995). Yin (2003) suggests that the case study approach is most effective when the research seeks to explore a phenomenon by conducting a firsthand direct observation, this is also known as an empirical enquiry.

“A case study is an empirical study that investigates a contemporary phenomenon in depth and with its real-life context” (Yin 2009 p18)

The research for this thesis seeks to explore the non engagement of first year engineering students in independent study and learning, and seeks to identify some of the factors which influence this phenomenon. For the purpose of this research it was decided that the group of students are regarded as being the “case”.

“Cases are units of investigation ..individuals..communities..groups”

(Henn et al 2010, p217)

Case studies are used across a range of social science fields including, education, management, political science, economics, history, psychology and sociology and is an effective method of establishing cause and effect. Crotty (1998) suggests that, meaning is found through engaging in realities in our world. The case study strategy of enquiry provides opportunity to engage in these realities in a real life context. Stake (1995) as cited in Creswell (2009) expresses the view that the case study approach allows an in-depth situation or individual can be explored. Hence the case study strategy of enquiry was selected as the most suitable to meet the requirements of the research for this thesis.
3.7 The Steps of the research process.

3.7.1 Step 1. The Exploratory Interviews.

The first step in the sequence was the qualitative research element. Data was collected in a series of four exploratory interviews with experienced lecturers of engineering. Prior to the commencement of these interviews permission was sought from the Head of the School. These interviewees were selected on the basis of their many years of experience as lecturers of first year engineering students. The ethical requirements for these interviews were met in full and were discussed earlier in Chapter one. Careful consideration was given to the selection of suitable interview questions. These questions needed to be clear and concise, while focusing on the research problem (Kvale 2007). For list of interview questions selected see Appendix 4. As mentioned earlier the review of the literature around first year students and their study habits uncovered a very useful research tool entitled, A brief Measure of Learner Autonomy (MLA) (Appendix 3) developed by Macaskill & Taylor (2010). This is a quantitative research tool comprising of twelve questions which provides a numeric value for of the students learning autonomy using a Likert scale. Learner Autonomy is described as a psychological characteristic of individuals able to direct their learning. (Knowles 1980). I opted to take further advantage of the interviews to consult with the experienced lecturers on the merits of the inclusion of this Measure of Learner Autonomy (MLA) in the student survey. The interview questions selected can be found in Appendix 4. The interviewees were made aware of the aims and objectives of the research. They were also informed about the purpose of the interviews which was to draw on their experience as lecturers of first year students, specifically with regard to their perceptions of the students study habits, and their approaches and attitudes to individual assignments. The Interviews were conducted on the following dates, 25\textsuperscript{TH} November 2010, 13\textsuperscript{th} December 2010 and 13\textsuperscript{th} January 2011.
3.7.2 Step 2. The Analysis of the Qualitative Data.

Basit (2003) regards the analysis of qualitative data to be the most difficult yet crucial elements on qualitative research. Creswell (2007) argues that the formation of categories is represented at the core of qualitative data analysis. The methodology for the coding of the qualitative data into themes which is championed by Taylor and Gibbs (2010) was selected for the analysis of the qualitative data for this research. Audio recordings were made of these interviews and these were later transcribed and subjected to detailed quantitative analysis. This process is detailed in Chapter Four. The transcripts of the four interviews can be found in Appendices 5, 6, 7 and 8.

Several interesting themes emerged from this process, these themes included,

- The Student Profile; age, gender, employment status and living arrangements.
- Study skills training.
- Study habits; study duration, frequency and location.
- Approach to preparing for assessments.
- CAO entry points level.

3.7.3 Step 3. The Student Survey.

The student survey could now be generated. While the findings from the interviews were allowed to have significant influence on the questions a strong focus was maintained on the original research question. The questions selected for inclusion in this survey can be found in Appendix 9. The student survey was generated in an online format using the Bristol Online Survey service. There were two reasons for selecting this format. The first was to take advantage of surveying software which aids the collection and analysis of quantitative data. The second was to facilitate completion by students during a session in a computer laboratory. It has been my experience that young students prefer to complete surveys online rather than in a written format. Prior to the commencement of the students survey permission was sought from the Head of the School.
The three groups of DIT students who completed the survey were selected on the basis of three criteria,
1. They were first year students.
2. They were studying engineering, and
3. They were studying on undergraduate programmes.

The ethical requirements for the student survey were met in full and were discussed earlier in Chapter one. The groups of students selected were studying on level seven undergraduate engineering programmes in the School of Manufacturing and Design Engineering. 72 students were requested to complete the online survey, of these 50 students completed the survey. All 50 surveys completed were usable. The surveys were completed in three separate sittings, the first was on 16\textsuperscript{th} of February 2011 the second on the 28\textsuperscript{th} of February 2011 and the third was on 3\textsuperscript{rd} of March 2011. These were arranged with the assistance of colleagues in the DIT.

3.7.4 Step 4. Analysis of the Students Survey.

As indicated earlier, the collection method used for this part of the study was quantitative. The data gathered was subjected to quantitative comparative analysis. In order to best meet the aims and objectives of the research and to best represent the significance of these results they were subsequently subjected to the qualitative analysis process. Strength was added to the research by revisiting the findings which emerged from the qualitative interviews during the qualitative analysis of the data from student survey.

3.7.5 Step 5. Presentation and discussion of the findings.

The findings of both the qualitative and quantitative research elements of the research study are presented and discussed in the next chapter.
Chapter Four

Presentation and Discussion of Findings

4.1 Introduction

In this chapter the findings of both the qualitative and quantitative research elements of the research study are presented and discussed. As indicated earlier, the qualitative research element was conducted first. Four experienced lecturers of engineering were interviewed; these interviews were exploratory in nature. Their purpose was to guide and inform the selection of questions to be used in the qualitative element of the research; this was in the form of a student survey.

4.2 Analysis, findings and discussions of the Pre Survey Qualitative data

As detailed in chapter three, the methodology for the coding of the qualitative data into themes which is championed by Taylor and Gibbs (2010) was selected for the analysis of the qualitative data for this research. The recordings of the four interviews were transcribed. The transcripts of the four interviews can be found in Appendices 5, 6, 7 and 8. The responses to each individual question were extracted and grouped together in a separate document generated specifically for analysis of the data. This facilitated the analysis of the data one question at a time. This document was then printed with the line spacing adjusted to double to allow sections of text to be circled and identified with common key words which when grouped became the codes. These codes were subjected to further scrutiny and were assembled under the four main emerging themes.

Seidel (1998) describes the basic process of qualitative data analysis as being cyclical in nature and consisting of three parts, noticing, collecting and thinking about interesting things. As the data was read, items were noticed and listed, these lead to further searching of the text for similar or related items and then their collection. The thinking involved in the examination of these resulted in the cycle staring over again. I experienced this phenomenon while engaging in the qualitative analysis of the research for this project.

The emerging themes were,
1. **The Students Profile,**
   Age, nationality, whether they were in paid employment and if so how many hours they worked per week, whether were living away from home while attending college, and their CAO points level.

2. **The students level of study skills,**
   If they studied on their own, when and where and how long they studied, whether they thought they spent enough time studying, whether they had ever been taught any study skills, whether they were aware that a study skills class was available to them.

3. **The students reactions and approaches to individual assessments,** whether they spread the work over the time available or leave it until near the time the assessments is due.

4. **The students level of learner autonomy,**

It became clear that the questions in the student survey needed to closely follow these themes. As was the intention at the outset of this research the emerging data combined with the research question itself guided and informed the selection of the questions which formed the online student survey.

**4.2.1 Theme 1. The Students Profile,**

**Age**
It was necessary to know the age of each student to be able to generate the students profile and to examine the comparisons between younger students who were coming directly from second level schools through the CAO system, and older students who may have spent some working in industry or studying other topics since leaving second level education.
In answer to the question “How do students respond to being given individual assignments to complete?” interviewee No2 made reference to the age of the students.
He replied,

“I find that young first year students don’t always respond well to formative assessments.”

Interviewee No 4 said that, it was his experience that mature students are “very applied”. Although one’s maturity is defined in the literature in a variety of ways, for the purpose of this research it is accepted that the interviewee was making reference to older students when talking about mature students. I concluded that the inclusion of a question in the survey relating to the age of the student would contribute to overall student profile. The question would identify students between 18 and 21 years of age, who were most likely to have been in the second level system in the recent past and those students over 21 years of age, who may not.

**Nationality**

Interviewee No 4 mentioned non national students twice during the interview. When answering the question, “Does the assignment design influence their response? For example if the assessment is summative or formative?” The following formed part of his response,

“*some of the better students and non-national students come to me asking for formative feedback in advance of the deadline*”

In response to the Question “Do you feel students are familiar with studying independently, are they aware of the need to study outside of class?” his answer included the following,

“*Again I would have to say in my experience non-national and mature students seem to be very applied*”

The inclination of the interviewee to group “mature students” and” non-national students” together would indicate that in his view, non-national students along with mature students demonstrated a genuine interest in their performance on individual assessment which was not demonstrated by younger students.
These references prompted me to consider the inclusion of the question about nationality which I not previously considered. It has been my experience that most non national students actively seek feedback following both formative and summative assessments. I concluded that the inclusion of a question in the student survey which identified the student as a non national, or from Ireland, would provide an interesting additional comparator for consideration when it came time to carry out the analysis of the data.

**Students being in paid employment.**

Interviewees No 1, 2 and 3 expressed the view that the student being in paid employment presented a barrier to their study and learning. Interviewee No 3 offered that,

> “they miss classes when they are in paid employment”.

Interviewee No 3 suggested that,

> “student's having jobs does present a barrier as it takes up a lot of their time”.

Interviewee No 4 disagreed with these views and made reference to how well students on part time programs performed compared to students on whole time programs. He gave the opinion,

> “Students being in paid employment, I don’t see that as being a major problem. The proof is clear to see with part time programs that have whole time parallel courses running during the day, and I have personal experience of this. The higher marks in the whole time program will correspond with the lower marks on the part time program”.

Harvey et al, (2006 p17) agrees with this position, suggesting that,

> “There is little evidence to suggest that moderate amounts of part time work adversely affects performance”.
Both Interviewees No 1 and No 3 suggested that it is likely that some students would not be able to afford to come to college if they were not in paid employment. In my experience, I have observed that older students who are in paid employment often put in the additional effort required for them to succeed. It is possible that they value the opportunity to study more than those students who come straight from second level. It would be necessary to include two questions in the survey relating to the students working, the first to establish if the person was working and the second to establish how many hours per week the person worked. When discussing this issue with one of my colleagues she suggested that it was her experience that many students engage in part time unpaid employment when not in college, for example working on the family farm or in a family shop in the evenings or at the weekend. I considered this to be a very valid point. This prompted me to include the words “paid or unpaid employment” in the question.

**Students living away from home.**

For Interviewees No 1, 2 and 3, a student living away from home did not present a major barrier to their independent study and learning. Interviewee No 1 suggested the contrary, he stated that,

“Students tell me they have a lot of time on their hands in the evenings, I’d imagine that they would use this to do a bit of study or to do assignments”.

Harvey et al (2006 p17) agrees with this position, suggesting that when considering this point maintained that,

“Living on campus is presumed to be an important factor in social integration but there is ambiguous evidence about whether living in residence actually enhances grades. Some research shows students living at home perform better in the first year”.

Interviewee No 4 disclosed that, he himself had moved out of the family home when he first went to college, but quickly moved back home where he found it easier to study.

He continued saying,
“So I suppose living away from home was a barrier to my study and learning, however that was just my experience”.

Although he did suggest that a lot depended on the student’s personality. While the views expressed by the interviewees did not fall heavily in favour of one view or the other, I concluded that I should take the opportunity to ask the students about their living arrangements. This would provide a valuable aspect of the student’s profile which would aid the comparisons I wished to make in attempting to establish factors which constituted barriers to the student’s independent study and learning. There is a common perception that students who move out of the family home, to go to college tend to spend less time studying because they are no longer under the watchful eye of their parents. I arrived at the conclusion that a question enquiring about the living arrangements of each student should be included in the student survey to establish if there is a link between how they scored on the MLA and whether they were living away from home or not.

**Cao points level.**

When asked the question, “Do you feel students are familiar with studying independently, are they aware of the need to study outside of class?” all four interviewees gave a negative response, Citing the assessment methods used at second level as the cause of the problem. When asked, “Do you have any suggestions for survey questions relating to Barriers to independent study and learning that have we have not covered already in this interview and that would contribute to my research? Interviewee No 3 recommended the inclusion of a question in the student survey which would provide details of the CAO point achieved by the student at second level. It was his belief that the entry level points relate directly to the performance of the student, the higher the points the better the student performs.
He revealed that,

“While filling out questionnaire forms I have noticed the performance statistics of first years has disimproved considerably over the past 10 years. The entry points on courses is certainly a factor”.

Mooney et al (2010) concurred with his views. When examining Leaving Certificate attainment in mathematics and English the study arrived at the following conclusions,

“Prior educational attainment is the strongest predictor of successful progression through higher education. This is reflected most clearly in Mathematics which is the strongest predictor of successful progression among higher education students. New entrants with higher points in Mathematics are most likely to progress. Very high proportions of new entrants with points below fifty do not continue their course of study into second year.” (Mooney et al, 2010 p28) see foot note #

I decided to take the recommendation of the interviewee as this would provide an opportunity to compare the CAO point’s level of the students with how they scored in the MLA.

4.2.2 Theme 2 The students level of study skills,

Do students study on their own?
Although students often prefer to study with others, they must also develop the skills to learn on their own. They will ultimately be examined on the knowledge they have acquired as individuals. When asked the question, “Do you feel students are familiar with studying independently, are they aware of the need to study outside of class?” interviewee No 1 suggested that, at secondary school, students do not focus on studying until it is getting close to exam time, and that this tactic is not effective at third level.

# On a point of clarification the reference to fifty points is related to number of points attained by the student in maths alone.
He highlighted his awareness when he said

“There are some subjects like technical subjects for which they tend to have assignments to be completed during the year, which is a good idea, I think. Whereas some subjects like mathematics may not traditionally have assignment work”.

Although it was a departure from the focus of the question it merits consideration that the interviewee made reference to mathematics. Arguably mathematics is one of the most important subjects studied by students of engineering, and in my experience is the subject which students struggle with most. It can be taken as a positive that the technical subjects the interviewee mentioned do include some mathematical elements. Interviewee No 2 responded to the same question by saying,

“I think that when they leave secondary school they forget that they need to study outside of class and they feel that what they do in class is enough to get them through examinations”.

Interviewee No 3 also made reference to second level, when he replied,

“No, they are not familiar with doing it because it’s not a feature of the second level environment they have come from, and I think it’s one of the biggest problems with first years really”.

I understood Interviewee No 4 to be referring to his students on third level engineering programs in his response to the same question. He offered,

“The difficulty is that under the current system students believe that if they turn up are almost entitled to a qualification”.
He went on to say how he encourages students to seek out valid additional sources of information, for example sources other than those listed in his handouts.

He continued by saying,

“if you say, (to the students) if you’re interested then you should look it up. Quite often they will come back to you to discuss what they found. These students have an automatic ability to study on their own”

He qualifies this by saying,

“the remainder of the student’s just feel that they are going to get sufficient information from the notes and the lectures to get a pass”.

All of the interviewees were in general agreement that the majority of first year are not familiar with studying independently. This supports the convention of the research that the lack of engagement in independent study by first years is an issue which is currently a matter of great concern to many educators in higher education in Ireland.

Student’s awareness of the study skills classes available to them.

The message I got from the interviewees was very clear, these lectures believe that the students need to have already developed effective study skills and the habit of using them, long before they come to college. On induction to the DIT students are made aware of the study skills support modules available to them. They may have simply forgotten they were told about them. Many educators agree that students suffer from information overload in the first two weeks or so in college. In my experience students most students especially in the early weeks are reluctant to admit they need help. Conscious of this, I decided to include a question in the survey enquiring if the students were aware of the study skills classes which are available to them. To establish the proportion of students who had taken study skills classes before, also to quantify the proportion of students who knew about them but had not availed of them.
Do you study on your own?
As one of my aims was to establish the study habits of the students, it was essential that I include a question in the student surveys which enquired of them directly “Do you study on your own?” this question was to be followed by several questions relating to the independent study habits of the student, I had to consider the course of action to be taken should the student’s response be “No”. While highlighting the importance of the development of a questionnaire which is properly organized and easy for the participant to use, Johnson & Christensen (2004) suggest that in this scenario a contingency of filter question can be used. This,

“directs people to different follow-up questions depending on their response”.
(Johnson & Christensen 2004 p 187)

It allows the researcher to,

“filter out participants from questions that these participants cannot or should not attempt to answer” (Johnson & Christensen 2004 p187)

I opting to include the question “Do you study on your own?” and to utilize this as a contingency or filter question. As this was the last question in Section 2 it was possible to insert a guidance note at the start of Section 3 which read “If you answered, No to the last question please skip to section 13. If you answered, Yes please continue”. This served to redirect the students who answered no, further on in the survey to questions which related to topics other than study habits. This required re-arranging the order of the questions in the survey and changing the status of some of the questions from compulsory to optional.

When, where and how long students study?
The inclusion of questions about when and where the students study would provide valuable information which would be compared and related to how they scored on the MLA. Of equal importance is the data about the amount of time the students spend studying on their own, it would be extremely interesting to learn if the students felt that they spent enough time studying
on their own. Felder (1998) argues that most engineering students are active, sensing, visual and sequential learners. Excluded from this list are reflective learners, who learn best by thinking things through and working alone and as a part of a group. It may be argued that, although engineering students may naturally fit into the former learning style categories, they need to become reflective learners early in their third level education if they are to meet the learning needs of their programs and when working in industry. The thought process required for individual reflection should therefore occupy a significant proportion of the time student devotes to independent study and learning. If the student does not spend enough time studying alone the likelihood is that they are not engaging in individual reflection. Students on engineering programs in the DIT are advised that they will need to spend an average of three hours per day studying, however the amount of time they should spend studying alone is not specified. I opted to design the question relating to how long students spent studying alone, into three categories, 0 to 2hrs, 2 to 4hrs and more than 4hrs, this would inform the research as to how much time the students actually spend studying alone and would provide an opportunity to examine the relationship between the amount of time they spent studying alone and the other information gathered in the students survey.

4.2.3 Theme 3 The students approaches to individual assessments.
The responses of two of the interviewees, No 2 and No 4, to the question relating to how first year students respond when given an individual assignment, were very similar. They indicated they the students respond well. They suggested that they manner in which they respond is usually a good indicator of how they will perform for the rest of first year. If the first assignment is met with enthusiasm by the student, he/she is likely to do well. Interviewee No 4 replied “They seem happy enough. The stronger ones see it as an opportunity to demonstrate that they know what they are doing”. He follows this by saying “the weaker ones would prefer it to be a group activity, that way the onus would not be on them to individually perform”. There may be scope to consider the reaction of the students as a method of identifying at risk students early in the first semester as a part of a future research. The experience of Interviewee No1 was somewhat different; he indicated that the students were often very surprised that they were expected to do assignments early in the first semester.
His response included

“I find that if you give them assessments early on, they are taken aback or astonished and it suddenly dawns on them that they have to start working from day one”.

Interviewee No 3’s experience differed from this, he offered that “they seem to be used to it, they don’t see it as unusual”. He also remarked that,

“One of the characteristics of first year students is that they unresponsive”.

The variety of responses generated by the question confirmed that people react in different ways to different situations, however when dealing with newly arriving first years there is another aspect to be considered. It has been my experience that the confidence of first year students builds as time passes. Student who behave in a self conscious way and are slow to contribute in their early weeks in college quite often come out of their shell within a few weeks. Until this happens, it is difficult to get to know them. Great care must be taken by lecturers not to form opinions on students too early in first year as their attitude and approach to the requirements of college life can change very quickly. The broad variety of responses from the interviewees about the reactions they got from students after giving them individual assignments to do, suggested to me that the responses from the students when asking them about how they react would be even broader. As the focus of this survey was to try and establish the barriers to the independent study and learning in approximately fifty students by quantitative means, I opted not to ask the students to think about how they react to being given individual assignments. The data arising from such a request would have been qualitative in nature and its volume would have been an issue. I opted to include one multiple choice question on this topic to try and gauge the students approach to doing the study required for individual assignments, focusing on whether they spread the work for the assignments over the available time or whether they left the work until near to the time was due. This would give an indication if they had an understanding that the learning at third level needs to happen on an ongoing basis and not immediately prior to the deadline for the work.
Assessment Design

In response to the question “Does the assignment design influence their response? For example if the assessment is summative or formative”. All four of the interviewees indicated that they do not give assignments which are formatively assessed to first year students. The reason being, as suggested by interviewee No 1,

“student’s are motivated by scoring points”,

Some would even ask

”how many points is it worth”.

Interviewee No 4 indicated that some

“come to me asking for formative feedback in advance of the deadline”

which he is more than willing to provide. He also indicated that some students who were less organized would not get the work done in time to get formative feedback, stating that,

“formative feedback is available to those who come looking for it in time. A lot depends on their time management”.

It could be argued that many first year students are not yet aware of the benefits of formative assessment. Although most of them have completed mock Leaving Certificate Examinations at second level, they are not usually willing to volunteer to do the additional work involved in exchange for an indication of their performance. The qualitative analysis of the data relating to this topic indicated that the inclusion of questions relating to the students opinions of summative and formative assessment would not serve to inform the research.
4.2.4 Theme 4 The student’s level of learner autonomy

As discussed in chapter three, the quantitative students survey consisted of two parts, the first section addressed the questions arising from the themes which emerged from the qualitative analysis of the interviews as detailed in the previous paragraphs, the second was an assembly of twelve questions which combine to form an already established and recognised survey, which is titled “a brief measure of learner autonomy” (MLA) Macaskill & Taylor (2010). This resource provides a numeric value for the student’s level of learner autonomy using a Likert scale. The Interviewees indicated that although they were not familiar with the MLA they all agreed there would be merit in it being used in the early stages of the first semester as an early indicator of the student’s learner autonomy which in turn would help to identify possible at risk students. Interviewee No 2 said that

“it would be very useful to know their level of learner autonomy when they come to us first”.

Interviewee No 4 suggested that

“it could be used to identify students who needed to adjust their behavior“.

The inclusion of the MLA as an independent section of the student’s survey would provide a valuable opportunity to examine the relationship between the student’s level of learner autonomy and the different aspect of their profile as well as their study habits and their approach to completing individual assessments. This exploration would form an integral part of the identification of barriers to the independent study and learning in the students surveyed which was the primary aim of this research.

As indicated earlier the selection of questions included in the student survey which was completed online by three groups of first year undergraduate engineering students were centered around the themes which emerged from the analysis of these interviews however they were also influenced by my own experiences as a lecturer, the literature around the themes and the main aims and objectives of the research study. The questions included in the online survey are detailed in Appendix (9)
4.3 Presentation and Discussion of the Findings and Analysis of the Student Survey.

In this section the findings of the student survey are presented and discussed. The methods used in the analysis of the data gathered are also detailed. As indicated earlier, the collection method used for this part of the study was a quantitative survey which was generated in an online format. The questions selected for inclusion in this survey can be found in Appendix 9. 72 students were requested to complete the online survey, of these 50 students completed the survey. All 50 surveys completed were usable. The Bristol Online Survey service used to generate the survey provides a facility within the software for conducting basic quantitative comparative analysis on the data generated. This facility was availed of to make comparisons between elements of the student’s profile, their study habits, their approach to assessments and examinations and their CAO Points level. Unfortunately the facility was not capable of calculating the MLA score for each student. This task was completed using an Excel spread sheet. The MLA score for each student was calculated using a 5 point Likert scale. The answers the students selected carried marks from 1 to 5 these were totalled resulting in an overall score with a possible maximum of 60. Findings and discussions are presented and discussed in the following order,

4.3.1 Age Related data.
- Age profile of sample.
- Age versus study skills.
- Age versus time spent studying.
- Age versus MLA score.
- Discussions around the age related data.

4.3.2 Gender related data,
- Gender profile of sample.
- Gender versus study skills.
- Gender versus awareness of study skills training available.
- Gender versus time spent studying.
- Gender versus MLA score.
- Discussions around the gender related data.
4.3.3 Living Arrangements Related Data
- Living arrangements of sample.
- Living arrangements versus time spent studying.
- Living arrangements versus MLA score.
- Discussions around the living arrangements related data.

4.3.4 Employment related Data
- Employment status of sample.
- Hours spent work by students in employment.
- Time spent working versus time spent studying.
- Employment versus MLA score.
- Discussions around the employment related data.

4.3.5 CAO Points related Data
- CAO points levels of sample.
- CAO points level versus time spent studying.
- CAO points level versus MLA score.
- Discussions around the CAO points related data.

4.3.6 Study Skills and Habits related Data
- Study skills training of sample.
- Study skills training versus time spent studying.
- Awareness of study skills training available.
- Study skills training versus MLA score.
- Do students study alone?
- Time spent studying per week by sample
- Preferred days of the week to spent time studying.
• Preferred Study location of sample.
• Perceptions of study required.
• Discussions around the study skills and habits related data.

4.3.7 Approach to Study for Individual Assignments related Data
• Approach to Study for Individual Assignments related Data
• Discussions around the approach to study for individual assignments related data.

4.3.1 Age Related Data.

Students were requested to indicate,
• if they were between 18 and 21 years or over 21 years.
• if they had ever received study skills training.
• how long they spent studying per week by selecting from three options, 0 to 2 hours, 2 to 4, or over 4 hours per week.

The average MLA score for each age group was calculated.

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<thead>
<tr>
<th></th>
<th>Age 18 – 21 years</th>
<th>Over 21 years</th>
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</thead>
<tbody>
<tr>
<td>Age profile of sample</td>
<td>90%</td>
<td>10%</td>
</tr>
<tr>
<td>Study skills trained</td>
<td>0%</td>
<td>52%</td>
</tr>
<tr>
<td>Not study skills trained</td>
<td>100%</td>
<td>48%</td>
</tr>
<tr>
<td>0 – 2 hours study per week</td>
<td>44%</td>
<td>0%</td>
</tr>
<tr>
<td>2 – 4 hours study per week</td>
<td>49%</td>
<td>60%</td>
</tr>
<tr>
<td>Over 4 hours study per week</td>
<td>10%</td>
<td>40%</td>
</tr>
<tr>
<td>Average score on the MLA scale Out of a possible max 60 marks</td>
<td>47.5</td>
<td>33.5</td>
</tr>
</tbody>
</table>

Fig 1
Younger students are more likely to have study skills training.
Younger students spend less time studying alone than older students
Younger students scored considerably lower on the MLA scale.
Discussions around the age related data.
Of significance are the findings that indicate that, despite not having any study skills training, older students spend more time studying and scored considerably higher on the MLA scale than younger students. It could be argued that these findings concur with the views of Knowles, (1980) suggesting that with maturity comes a higher degree of independence and learner autonomy. The findings also highlight the deficiency of study skills in older students.

4.3.2 Gender Related Data.
Students were requested to indicate,

- their gender
- if they had ever received study skills training.
- if they were aware of the study skills training available to them.
- how long they spent studying per week by selecting from three options, 0 to 2 hours, 2 to 4, or over 4 hours per week.

The average MLA score for each age group was calculated.

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender profile of sample</td>
<td>90%</td>
<td>10%</td>
</tr>
<tr>
<td>Study skills trained</td>
<td>55%</td>
<td>20%</td>
</tr>
<tr>
<td>Not study skills trained</td>
<td>45%</td>
<td>80%</td>
</tr>
<tr>
<td>Aware of study skills training available</td>
<td>45%</td>
<td>40%</td>
</tr>
<tr>
<td>Not Aware of study skills training available</td>
<td>55%</td>
<td>60%</td>
</tr>
<tr>
<td>0 – 2 hours study per week</td>
<td>42%</td>
<td>40%</td>
</tr>
<tr>
<td>2 – 4 hours study per week</td>
<td>47%</td>
<td>40%</td>
</tr>
<tr>
<td>Over 4 hours study per week</td>
<td>11%</td>
<td>20%</td>
</tr>
<tr>
<td>Average score on the MLA scale Out of a possible max 60 marks</td>
<td>45.2</td>
<td>41.5</td>
</tr>
</tbody>
</table>

Fig2
More males were aware of study skills training than female students.
More male students had study skills training than female students.
Female students spent slightly more time studying than males.
Female students scored slightly higher on the MLA scale.

**Discussions around the gender related data.**
Of significance here are the findings which indicate that fewer females have study skills training than males, yet they spend slightly more time studying. Females scored slightly higher on the MLA scale than males. Many psychologists suggest that young females behave in a more mature and independent manner than males of the same age. Knowles (1980) theory of andragogy could also be argued here. The findings also highlight the deficiency of study skills and awareness of the training available in both genders.

4.3.3 Living Arrangements Related Data
Students were requested to indicate,
- if they were living at home or away from while attending college
- how long they spent studying per week by selecting from three options, 0 to 2 hours, 2 to 4, or over 4 hours per week.

The average MLA score for each age group was calculated.

<table>
<thead>
<tr>
<th>Living Arrangements</th>
<th>Living at home</th>
<th>Living away from home</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – 2 hours study per week</td>
<td>46%</td>
<td>32%</td>
</tr>
<tr>
<td>2 – 4 hours study per week</td>
<td>47%</td>
<td>50%</td>
</tr>
<tr>
<td>Over 4 hours study per week</td>
<td>7%</td>
<td>18%</td>
</tr>
<tr>
<td>Average score on the MLA scale</td>
<td>40.9</td>
<td>42.95</td>
</tr>
</tbody>
</table>

**Fig3**
Students living away from home spend considerably more time studying alone.
Students living away from home scored slightly higher on the MLA scale

**Discussions around the living arrangements related data.**
The findings here which indicate students living away from home spend more time studying alone concur with the views (Harvey et al, 2006) and also of one of the interviewees. When
asked if he thought, students’ living away from home was a barrier to their learning, he indicated,

“Students tell me they have a lot of time on their hands in the evenings, I’d imagine that they would use this to do a bit of study or to do assignments”.

Harvey et al (2006) p17 agrees with this position,

“Living on campus is presumed to be an important factor in social integration but there is ambiguous evidence about whether living in residence actually enhances grades. Some research shows students living at home perform better in the first year”.

It could be argued that living away from home takes a considerable degree of maturity and independence. This maturity is reflected in the amount of time spent studying and the slightly higher score on the MLA scale.

4.3.4 Employment related Data

Students were requested to indicate,

- if they were in paid employment
- if in employment, how long they spent working per week, 0 to 10 hours, 10 to 20 hours, or over 20 hours per week.
- how long they spent studying per week by selecting from three options, 0 to 2 hours, 2 to 4, or over 4 hours per week.

The average MLA score for each age group was calculated.

<table>
<thead>
<tr>
<th>Employment status</th>
<th>In paid employment</th>
<th>Not in paid employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working 0 to 10 hours per week</td>
<td>47% (18% of the sample)</td>
<td></td>
</tr>
<tr>
<td>Working 10 to 20 hours per week</td>
<td>36% (15% of the sample)</td>
<td></td>
</tr>
</tbody>
</table>
Students in employment spend slightly less time studying alone than those not in employment. Students in employment scored slightly higher on the MLA scale than those, not in employment.

**Discussions around the employment related data.**

The interviewees were divided on whether or not students, being in employment was a barrier to their independent study and learning. Harvey et al, (2006 p17) took the position that,

> “There is little evidence to suggest that, moderate amounts of part time work adversely affects performance”.

However the findings indicate that some of the students were working 20 and more hours per week.

Yorke & Longden (2008) indicated that working up to 19 hours per had a negligible impact on attrition in first year students however if the number of hours went any higher there was a significant influence on attrition.

Surveying first year students on their employment status and the hours they work might help to identify at risk students. Three of the four interviewees suggested that it was likely that these students would not be able to come to college if they weren’t in employment. They also indicated that in their experience, many students in employment value the opportunity to come to college more than the students not in employment and they put in the extra effort to succeed. The findings also indicate that although some of the students were working 20 and more hours per week, they spent only slightly less time studying alone than those students not in employment.

<table>
<thead>
<tr>
<th>Working over 20 hours per week</th>
<th>17% (5% of the sample)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – 2 hours study per week</td>
<td>42%</td>
</tr>
<tr>
<td>2 – 4 hours study per week</td>
<td>47%</td>
</tr>
<tr>
<td>Over 4 hours study per week</td>
<td>11%</td>
</tr>
<tr>
<td>Average score on the MLA scale Out of a possible max 60 marks</td>
<td>42.6</td>
</tr>
</tbody>
</table>

**Fig4**

Students in employment spend slightly less time studying alone than those not in employment. Students in employment scored slightly higher on the MLA scale than those, not in employment.
4.3.5 CAO Points related Data

Students were requested to indicate,

- if they had completed the LCE
- if they did, what points they got, from 0 to 250 CAO points, from 250 to 400 CAO points or over 400 CAO points
- how long they spent studying per week by selecting from three options, 0 to 2 hours, 2 to 4, or over 4 hours per week.

The average MLA score for each age group was calculated.

<table>
<thead>
<tr>
<th>Profile of sample</th>
<th>Completed LCE</th>
<th>Did not completed LCE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>96%</td>
<td>4%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAO points level of Those who took LCE</th>
<th>CAO points sore 0 - 250</th>
<th>CAO points sore 250 - 400</th>
<th>CAO points sore over 400</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – 2 hours study per week</td>
<td>8%</td>
<td>65%</td>
<td>27%</td>
</tr>
<tr>
<td>2 – 4 hours study per week</td>
<td>80%</td>
<td>28%</td>
<td>40%</td>
</tr>
<tr>
<td>Over 4 hours study per week</td>
<td>20%</td>
<td>44%</td>
<td>50%</td>
</tr>
<tr>
<td>Average score on the MLA scale</td>
<td>38.4</td>
<td>40.2</td>
<td>42.3</td>
</tr>
</tbody>
</table>

Fig5

Students with lower CAO Points on entry spend less time studying alone.
Students with higher CAO point scored higher the MLA scale

Discussions around the CAO points related data.
The findings indicate that higher CAO points on entry to college are an indicator of higher learner autonomy. Although the assessment designs in second and third level for the most part are completely different, it is generally recognised that a significant amount of independent study and learning is required to achieve over 400 CAO points. This would suggest that students who scored 400 CAO points are likely to have developed good study habits before doing the LCE.

One of the interviewees was very keen to see the CAO level question included in the student survey. Being a course co-ordinator he was very interested in the relationship between CAO point’s levels and students levels of learners autonomy.

4.3.6 Study Skills and Habits related Data

Students were requested to indicate,

- if they had ever received study skills training.
- if they were aware of the study skills training available to them.
- If they studies alone
- how long they spent studying per week by selecting from three options, 0 to 2 hours, 2 to 4, or over 4 hours per week.
- preferred days of the week for study, weekdays, weekends or both.
- preferred location for study, in college, at home, Both.
- If they think they spent enough time studying.

The average MLA score for each age group was calculated.

<table>
<thead>
<tr>
<th>Study habits of sample</th>
<th>Studies alone</th>
<th>Does not study alone</th>
</tr>
</thead>
<tbody>
<tr>
<td>96%</td>
<td>4%</td>
<td></td>
</tr>
</tbody>
</table>
### Study habits of sample

<table>
<thead>
<tr>
<th>Study habits of sample</th>
<th>Study skills trained</th>
<th>Not study skills trained</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – 2 hours study per week</td>
<td>38%</td>
<td>42%</td>
</tr>
<tr>
<td>2 – 4 hours study per week</td>
<td>43%</td>
<td>54%</td>
</tr>
<tr>
<td>Over 4 hours study per week</td>
<td>19%</td>
<td>4%</td>
</tr>
</tbody>
</table>

### Awareness of study training of sample

<table>
<thead>
<tr>
<th>Awareness of study training available</th>
<th>Study skills trained</th>
<th>Not study skills trained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aware of study skills training available</td>
<td>44%</td>
<td>56%</td>
</tr>
</tbody>
</table>

### Perceptions of enough study of sample

<table>
<thead>
<tr>
<th>Perceptions of enough study of sample</th>
<th>Study skills trained</th>
<th>Not study skills trained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students who think they don’t spend enough time studying</td>
<td>77%</td>
<td></td>
</tr>
<tr>
<td>Students who think they do spend enough time studying</td>
<td>23%</td>
<td></td>
</tr>
</tbody>
</table>

### Preferred study location of sample

<table>
<thead>
<tr>
<th>Preferred study location of sample</th>
<th>Study skills trained</th>
<th>Not study skills trained</th>
</tr>
</thead>
<tbody>
<tr>
<td>At home</td>
<td>63%</td>
<td></td>
</tr>
<tr>
<td>In college</td>
<td>33%</td>
<td></td>
</tr>
<tr>
<td>Both at home and in college</td>
<td>4%</td>
<td></td>
</tr>
</tbody>
</table>

### Preferred time of the week to study

<table>
<thead>
<tr>
<th>Preferred time of the week to study</th>
<th>Study skills trained</th>
<th>Not study skills trained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekdays</td>
<td>64%</td>
<td></td>
</tr>
<tr>
<td>Weekends</td>
<td>32%</td>
<td></td>
</tr>
<tr>
<td>Both weekdays and weekends</td>
<td>4%</td>
<td></td>
</tr>
</tbody>
</table>

**Fig6**

Students with study skills training spend more time studying alone.
Students without study skills scored slightly higher on the MLA scale.
Most students prefer to study at home on weekdays.
Most students are aware that they don’t study enough.

**Discussions around the study skills and habits related data.**
The findings several significant issues here, despite being told at induction that they will need to study about 15 hours per week most of the students are only studying for a fraction of the time they need to. 4% percent of students do not study alone at all. Only 12% study for more than 4 hours per week. 48% have never had any study skills training. As mentioned earlier these surveys were completed in the early part of the second semester which is past the time that most attrition occurs. Students with study skills training do not necessarily reflect a higher score on the MLA scale. Approximately half of the students are not aware of the study skill training that available to them. The findings do provide the positive news that students with study skill training spend more time studying than those without. The finding indicate that most student prefer to study on weekdays at home. This might suggest that the college facilities are not conducive to study and that the students like to keep the weekends free for socialising and resting. The overall findings of this section highlight issues of major significance to the overall study by providing an interesting picture of the study habits of first year students.

**4.3.7 Approach to Study for Individual Assignments and related Data**
The students were asked to indicate when they carried out the independent study and learning required for the completion of individual assignments, did they

- spread the work over the available time,
- wait until close to the time is due or did they
- ask their classmates when they were going to do it first.

<table>
<thead>
<tr>
<th>Sample response</th>
<th>spread the work over the available time,</th>
<th>wait until close to the time is due</th>
<th>ask their classmates when they were going to do it first</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>30%</td>
<td>68%</td>
<td>2%</td>
</tr>
</tbody>
</table>

Fig7

**Discussions around the approach to study for individual assignments related data.**
This question was designed to establish if the students in the scheduling and planning of their study. The findings indicate that a small number do plan ahead and spread the work for assignments over the time available.

Graphical representation of key elements of the data can be found in Appendix 10.
Chapter Five

Conclusions and Recommendations

5.1 Introduction
In this chapter the final conclusions of the research for this thesis are presented. The recommendations which have emerged from the research undertaken are detailed and possible further research is suggested.

5.2 Conclusions of the research.
The conclusion of this project is that the aims and objective of the research project have been met in full. The aim of this research was to identify some of the factors which constitute barriers to the independent study and learning of a group of first year engineering students studying at the DIT through the use of sequential mixed method research design which was underpinned by the Pragmatist theoretical perspective. The case study strategy of enquiry was employed with data being collected from two sources, starting with a series of four qualitative exploratory interviews with experienced lecturers of engineering, followed by an online student survey. The interviews were successfully completed and the emerging data combined with a study of the literature served to guide and inform questions which were included in the second stage of the study; the quantitative student survey. The review of the literature uncovered a very useful research tool entitled, A brief Measure of Learner Autonomy (MLA) this provided a numeric value for of the students learning autonomy, this tool was successfully incorporated into the online students survey. Fifty online surveys were successfully completed by first year undergraduate engineering students and the data was analysed and discussed.

An overview of the findings

Identified by the research as being factors which constitute barriers to the independent study and learning of first year engineering students were,
• Lack of real commitment to study by the students. Findings indicated that 4% percent of students do not study alone at all. Only 12% study for more than 4 hours per week. 77% of students felt that they did not spend enough time studying.

• Lack of sound study skills such as note taking, organisation and time management and reflective thinking, 48% have never had any study skills training. Approximately half of the students are not aware of the study skill training that available to them. Study skills training is difficult to access for many students and is not given the sufficient priority by the college.

• students prefer to study at home; this might suggest that the college facilities are not conducive to study.

• 38% of the students were in paid employment. (19 of the 50)

  17% of the students in employment spend over 20 hours working per week; the research tells us that working more than 19 hours per week significantly increases the risk of attrition in first year students.

• Younger students and students with low CAO points are highly prone to attrition and need to be provided with additional support and guidance in they are to stay in college.

• The findings indicate that over 3% of the sample work more than 20 hours per week

The majority of the findings confirm much of the existing the literature on the topic. The findings which indicate that students with study skills training spend more time studying than those without concur with (Gibbs et al 1994) where the suggesting is that study skills training is of great value to students. The findings indicate that younger students spend less time studying and scored considerably lower on the MLA scale, this, it could be argued concurs with the views of Knowles (1980) suggesting that, with maturity comes a higher degree of independence and learner autonomy.

The findings that indicate that 48% of the sample had not had study skills training on entering college, suggests that academic unpreparedness could be a contributory factor to non engagement in study and attrition. The findings concur with (Mc Innes et al, 2000) where it is suggested that the paths between second and third level at times are not well matched.
The importance of academic and emotional preparedness for the transition to higher education is highlighted in the research (Rickinson & Rutherford 1995). Students in this sample with low CAO point were recorded as engaging in very little independent study and marked lowest on the MLA scale. It could be argued that, as the Yorke & Longden (2008) study suggests the lower the entry marks of a student, the more likely they will not finish first year. This is reflected in a HEA (2010) study which focused specifically on the performance in mathematics of the student in the LCE. It is recorded here in historical data that the lower the CAO points in maths the higher the chance of attrition.

Of concern are the findings which indicate that over 5% of the sample work more than 20 hours per week, Choy (2002) shows that students who worked more than fifteen hours per week, had a lower persistence rates. Yorke & Longden (2008) suggests that the pivotal amount of hours is nineteen.

**Reflection on the research project.**

There are some things I would do differently if I were to conduct this piece of research again. Had the group been surveyed the students earlier, for example midway through the first semester the group may have been more representative of a typical incoming first year cohort (rather than the group surveyed for this project which had survived to the second semester). The study would be strengthened by a comparison between the study habits and learner autonomy of two sample groups, one which had taken a study skills module early in the first semester as part of their program, and one which had not. The findings would provide valuable insight into how study skills training influences the study habits and learner autonomy of the students. Another possible improvement to this research would be to seek an international collaboration with researchers working in a country where the average age of students entering college is higher than here in Ireland. The study would provide the opportunity to make comparisons between the study habits and learner autonomy of two groups of first year students of with different age profiles. The inclusion of questions relating to the college oriented social activity of the students would explore the impact of social integration or the lack of it on the study habits of students.
End Note;
One of the participants of this study approached me as he exited the computer laboratory having completed the online survey, he said that the process of completing the survey forced him to think about his study habits and his approach to doing assignments it wasn’t until he began to think about the answers that realised how little attention he was giving to studying. He described the process as being “a real eye opener”. Perhaps there was a message here for the research. Perhaps the way to get the students to change their ways is to get then to answer questions which force them to think deeply about what they are doing and what they should be doing.

5.3 Recommendations and further research

Recommendations
The following are some recommendations which emerged from the research which would benefit first year engineering students, third level lecturing and administration staff and higher education in general.

• Of benefit would be the early identification of at risk first year students. This possibly could be achieved with the aid of a student survey enquiring about their study habits and skills. This could include the Measure of Learner Autonomy (MLA).

• First year Students need more structure, they need to be helped to find a suitable balance of social and academic activity. They may benefit from a structured weekly study timetable with dedicated time slots for each subject or assignment, perhaps with a proportion of the time to be spent studying in college for which attendance is recorded.

• Third level institutes need to recognize how crucial sound study skills training is to the success of first year students by making it a compulsory element of the induction process.

• Study Skills training centers similar to those which have been set up address the problems students have with Mathematics need to be set up in all of the DIT campuses to support the needs of incoming students, and,
• Staff need to be helped to develop greater awareness of the needs of first year students.

Further Research
A two stage research project similar in design to this project which follows the students to the second year allowing their learner autonomy development to be recorded and examined would be of considerable interesting and would contribute to the body of knowledge on the subject.

As mentioned in the conclusions section. There would be merit in conducting similar research to this one with amendments, such as the inclusion of a comparison between two study sample groups, one which had taken a study skills module early in first year as part of their program and one which had not. The findings would have provided in valuable insight into how study skills training influences the study habits and learner autonomy of the students.
References.


British Educational Research Association  *Revised Ethical Guidelines for Education Research will inform this research.* Retrieved from  
http://www.bera.ac.uk/files/guidelines/ethical.pdf September 22
d, 2010

British Sociological Association, Ethical Guidelines Retrieved from,  
http://www.britsoc.co.uk/equality/Statement+Ethical+Practice.htm September 29th, 2010


College Applications Office,  http://www.cao.ie/CAO,

Dublin Institute of Technology.

Creswell, J. (2007). *Qualitative enquiry and research design. Choosing among the approaches.* (3


Engineers Ireland, http://www.engineersireland.ie/


Tinto, V. (2010) *Enhancing Student Retention: Lessons Learned in the United States* 


Appendices
Appendix 1

Participant Information Sheet

Research Project Title: “What are the barriers to independent study and learning in first year undergraduate engineering students?”

I am currently undertaking an MA in Higher Education in DIT Learning Teaching and Technology Centre and I would like to research the reasons why some first year engineering students don’t engage in the independent study and learning required for the individual assignments.

Please take time to read the following information and contact me if there is anything you would like clarified or if you would like more information.

About the study

It has been my personal experience that some first year engineering students do not complete their independent assignments. I decided, following discussions with colleagues, that there would be merit in the selection of this topic for my Master’s thesis research.

The research design requires an initial qualitative research element, which will involve the interviewing of three experienced lecturers of engineering. I will use these interviews for exploratory purposes, utilising the findings to guide and inform my selection of the questions used in a quantitative survey, which will be completed by a group of first year undergraduate engineering students.

Should you decide to take part you will be asked to sign a consent form which is attached for your information. If you do decide to take part but subsequently change your mind you are free to withdraw at any time without giving a reason.
If you experience any problems with the research, then please bring this to my attention immediately. If it is not appropriate to address your concerns to me, then you can contact my supervisor, Ms Martina Crehan, whose contact details are available at the end of this document. Again, all information collected during the course of the research will be kept strictly confidential and all data will be anonymised so that individuals or the College/ School cannot be recognized in it. Should you require copies of our conversation and subsequent transcripts, you are welcome to request same. The results of the research will be used to write my MA thesis which will be submitted in early July 2011. After the thesis is examined it will be stored in DIT’s Learning and Teaching Library where it will be accessible to its students.

**Contact for further information**

Robert Morris  
Sheetmetal Section  
Department of Fabrication and Welding  
Linenhall  
Dublin Institute of Technology  
Bolton Street  
Dublin 1  
Tel: 01 4024040  
E-Mail: Robert.Morris@DIT.ie

Ms Martina Crehan, email: martina.crehan@dit.ie

Thank you for reading this and for taking the time to consider participating.
Appendix 2 Interview consent form.

<table>
<thead>
<tr>
<th>PARTICIPANT CONSENT FORM</th>
</tr>
</thead>
</table>

**Title of Research Project:** “An *exploration of the barriers to independent study and learning in first year undergraduate engineering students?*”

**Name of Researcher:** Robert Morris

Participant Identification Number for this project: 

Please initial box

1. I confirm that I have read and understand the information sheet for the above project and have had the opportunity to ask questions. 

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason.

3. I understand that my responses will be anonymised before analysis. I give permission for the researcher and the Supervisor to have access to my anonymised responses.

4. I agree to take part in the above project.

<table>
<thead>
<tr>
<th>__________________________</th>
<th>__________________________</th>
<th>__________________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of Participant</td>
<td>Date</td>
<td>Signature</td>
</tr>
<tr>
<td>__________________________</td>
<td>__________________________</td>
<td>__________________________</td>
</tr>
<tr>
<td>__________________________</td>
<td>__________________________</td>
<td>__________________________</td>
</tr>
</tbody>
</table>

| __________________________ | __________________________ | __________________________ |
| Researcher                 | Date                       | Signature                  |
Appendix 3

Measure of Learner Autonomy

Autonomous learning (Macaskill, & Taylor, 2010)

Which of the following best describes you;

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all</td>
<td>quite</td>
<td>Neither like</td>
<td>quite</td>
<td>Very</td>
</tr>
<tr>
<td></td>
<td>like me</td>
<td>unlike me</td>
<td>or unlike me</td>
<td>like me</td>
<td>like me</td>
</tr>
</tbody>
</table>

Independence of learning

1. I enjoy finding information about new topics on my own. 1 2 3 4 5
6. Even when tasks are difficult I try to stick with them. 1 2 3 4 5
7. I am open to new ways of doing familiar things. 1 2 3 4 5
8. I enjoy being set a challenge. 1 2 3 4 5
10. I tend to be motivated to work by assessment deadlines. 1 2 3 4 5
11. I take responsibility for my learning experiences. 1 2 3 4 5
12. I enjoy new learning experiences. 1 2 3 4 5

Study habits

2. I frequently find excuses for not getting down to work. 1 2 3 4 5
3. I am good at meeting deadlines. 1 2 3 4 5
4. My time management is good. 1 2 3 4 5
5. I am happy working on my own. 1 2 3 4 5
9. I plan my time for study effectively. 1 2 3 4 5

Scoring: Questions 2 & 10 are reverse scored
**Autonomous learning**

*Which of the following best describes you;*

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all</td>
<td>quite</td>
<td>Neither like</td>
<td>quite</td>
<td>very</td>
</tr>
<tr>
<td></td>
<td>like me</td>
<td>unlike me</td>
<td>or unlike me</td>
<td>like me</td>
<td>like me</td>
</tr>
</tbody>
</table>

1. I enjoy finding information about new topics on my own 1 2 3 4 5
2. I frequently find excuses for not getting down to work. 1 2 3 4 5
3. I am good at meeting deadlines. 1 2 3 4 5
4. My time management is good. 1 2 3 4 5
5. I am happy working on my own. 1 2 3 4 5
6. Even when tasks are difficult I try to stick with them. 1 2 3 4 5
7. I am open to new ways of doing familiar things. 1 2 3 4 5
8. I enjoy being set a challenge. 1 2 3 4 5
9. I plan my time for study effectively. 1 2 3 4 5
10. I tend to be motivated to work by assessment deadlines. 1 2 3 4 5
11. I take responsibility for my learning experiences. 1 2 3 4 5
12. I enjoy new learning experiences. 1 2 3 4 5

**Scoring:** *Questions 2 & 10 are reverse scored*
Appendix 4
Interview Questions

Interview Date…………. Interview location…………………………….
May I start by saying, thankyou for agreeing to take part in this interview.
I would like to inform you that our identity will not be revealed and that this interview is being recorded for transcription purposes.
The title of my research thesis is “what are the barriers to independent study and learning in first year engineering students”
I plan to use this interview to draw on your considerable experience for guidance in the selection of questions which will be part of a quantitative survey to be completed by first year undergraduate engineering students.
At the end of the interview you will have the opportunity to make any suggestions you feel might contribute to this research.
The first question is,
Q. Have you, as part of your duties as a lecturer had occasion to issued first year engineering student assessments to be completed on an individual basis?
A.
Q. How do students respond to being given individual assignments to complete.
A.
Q. Does whether the assignment is summatively or formatively assessed influence their response.
A.
Q. What proportion of these students don’t meet the deadline for the completion of assignments?
A.
Q. Have students who have not completed assignments provided reasons why, if yes please elaborate?
A.
Q. In your experience do first year engineering students know the difference between teaching and learning?
A.
Q. Have students approached you seeking help with study skills?
A.
Q. Do you think that there would be merit in the measurement of each student’s autonomy in at an early stage in the first semester?
A.
Q. Which of the following present greater barriers to independent study and learning in first year engineering students most? If in your opinion you believe there are other factors please elaborate.

1. The lack of the students study skills.
2. The students lack of self motivation.
3. The distractions which occur during the onset of adulthood.
4. The student being in paid employment.
5. The student living away from home.

A.
The last question is,
Q. Do you have any suggestions for survey questions the answers to which would contribute to my research?
A.
Thanks again for taking time out of your busy schedule to take part in this interview.
Appendix 5

Interview No 1 Transcription

Interview No.1

Interview Date 25 November 2010, Interview location, D.I.T. Bolton Street

May I start by saying, thank you for agreeing to take part in this interview?

I would like to confirm that your identity will not be revealed and that this interview is being recorded for transcription purposes.

The title of my research thesis is “what are the barriers to independent study and learning in first year engineering students”

I plan to use this interview to draw on your considerable experience for guidance in the selection of questions which will be part of a quantitative survey to be completed by first year undergraduate engineering students.

At the end of the interview you will have the opportunity to make any suggestions you feel might contribute to this research.

The first question is,

Q. Have you, as part of your duties as a lecturer had occasion to issue first year engineering student assessments to be completed on an individual basis?

A. Yes I have.

Q. How do students respond to being given individual assignments to complete?

A. Well if you are talking about first year students the thing I find is that if you give them the assessments early on they are taken aback or astonished and it suddenly dawns on them that they had to start working from day one and not just having exams at the end of the year where they delay any form of research or study.

Q. So it’s a case that they are surprised that they have to get started working on their own so early?

A. Correct.

Q. Does the assignment design influence their response? For example if the assessment is summative or formative.

A. Absolutely, students are motivated by scoring points unfortunately, but if it is formative they are not so motivated where if it is summative it means they are going to gain points and therefore
they measure, they will ask you how many points it is worth, so therefore the amount of energy they prefer to give the assignment is directly proportionate to the marks been given.

Q. What proportion of students do not meet the deadline for the completion of assignments?
A. Well it will vary according to the Course and it seems to vary also in accordance to the points level they entered the Course at and their previous background, they way they have been motivated. I’d say on one Course I have it could be from the initial cohort coming into the College it could be as high as 15% but on another Course it could be as low as 10%.
Q. Have students who have not completed assignments provided reasons why, if yes please elaborate?
A. Well normally the students who don’t complete assignments are those who tend to disappear and don’t attend lectures and don’t come to see you. It would be a low number who have genuine reasons for not completing assignments and they would be the ones who tend to come to you and say look I really don’t understand what I have to do here and I won’t have this in time or there are other factors outside the class affecting my ability to have this.
Q. Have they ever informed you of what they might be?
A. Well yes, sometimes you wouldn’t be too sure that the information they were giving you would be correct but all you can do is take them at their word. Sometimes there would be occasions when there might be say medical factors coming into play or maybe personal issues in their lives. Usually they are the issues. Also in first year probably in the first semester you would find there would be a proportion of students who wouldn’t be too sure they really wanted to be here on this Course and they are feeling their way through and they may not produce the assignments that you’ve given them because they are still not quite sure. They kind of use the non handing-in of them as a kind of decision as saying I’m not going to pursue the Course any further.
Q. Do you feel students are familiar with studying independently, are they aware of the need to study outside of class?
A. I think their previous experience with leaving certificate and junior certificate they kind of think towards the end of the year and they say, okay, I don’t really have to worry about this and they won’t unless they think they can get a lot of exam papers and say I need to know this, that
and the other and I'm going to pass the exam then, but I think that's a flaw in secondary schools in general. There are some subjects like technical subjects they tend to have assignments to be completed during the year which is a good idea I think. So it depends on what kind of subjects they may have taken in secondary school especially if they are given assignment work. Whereas some subjects like mathematics may not traditional have assignment work.

Q. So if there is only one summative exam at the end they may not be inclined to carry out independent

A. Well it would be alien for them it would be their first experience of it.

Q. Have students approached you seeking help with study skills?

A. Yes they have. In general they are the students who tend to do well because they are the ones who are thinking early on about how can I survive this; how can I get through this; A lot of students are teenagers and they are thinking maybe about Friday night and Thursday night going out, sometimes the study is not the first thing on their minds. Whereas it would be earnest students who need to develop study skills and they will come to you and say they are having problems and I think they tend to be valuable students cause usually when they are showed where to go and where the assistance is they thrive on it.

Q. Autonomous learning is described as the learner’s ability to acquire knowledge or skills of value by processes that he or she determines. A measure of learner’s autonomy was developed in May of this year in the United Kingdom. Do you think that there would be merit in the measurement of each student’s autonomy at an early stage in the first semester?

A. Yes, there would be. I imagine it is quite difficult to measure. I haven’t heard of this method of measuring. I think it is a very important skill for people to learn, ultimately no matter what it is in life. I think all the great humans beings are those who are naturally autonomous learners and they do autonomous research, so I think it should nearly be a subject in College no matter what people are studying, how to study and research, how to find information. I know it is given some lip service by some lecturers, but it would be a good idea if students, in the first week at college were given little assignments, not necessarily relating to their area of study, which required them to seek out information, this would help them to learn how to learn.

Q. Which of the following do you feel present greater barriers to independent study and learning in first year engineering students most?
1. The lack of the students study skills.
2. The students lack of self motivation.
3. The distractions which occur during the onset of adulthood.
4. The student being in paid employment.
5. The student living away from home.
6. If in your opinion you believe there are other factors please elaborate.

A. All of these are barriers. The Student living away from home may not be much of a barrier. Students tell me that they have a lot of time on their hands in the evenings. I’d imagine that they would use this to do a bit of study or do assignments. Lack of student study skills would be a significant barrier. Self motivation is possibly the biggest barrier. Students need to be self motivated; all the great musicians for example, are highly motivated because the love for what they are doing. They become engrossed in what they are doing. It’s important that when people are selecting an area of study that it’s something that they really like doing and something that they won’t see as a burden. Regarding paid employment, unfortunately quite a lot of students need to work so that they can afford to study and also to augment their lifestyle, so yes, a student having a job does present a barrier as it takes up a lot of their time. We have to be realistic; some mature students may have no choice but to work as they may have children to support. Also from my own experience although I studied at night for many years being from the social economic background I am from. I would not have been able to study if I hadn’t had a fulltime job. I can recall often studying until 3 or 4 in the morning to meet assignment deadlines. I was highly motivated. I suppose that highlights even more the importance of self motivation in students.

The last question is,
Q. Do you have any suggestions for survey questions relating to Barriers to independent study and learning that have we have not covered already in this interview and that would contribute to my research?

A. I think we have covered all the issues which would constitute barriers to student’s individual learning during the interview, so I have nothing further to add.

Thanks again for taking time out of your busy schedule to take part in this interview.
Appendix 6
Interview No 2 Transcription

Interview No.2

Interview Date 25 November 2010, Interview location, D.I.T. Bolton Street

May I start by saying, thank you for agreeing to take part in this interview?

I would like to confirm that your identity will not be revealed and that this interview is being recorded for transcription purposes.

The title of my research thesis is “what are the barriers to independent study and learning in first year engineering students”

I plan to use this interview to draw on your considerable experience for guidance in the selection of questions which will be part of a quantitative survey to be completed by first year undergraduate engineering students.

At the end of the interview you will have the opportunity to make any suggestions you feel might contribute to this research.

The first question is,

Q. Have you, as part of your duties as a lecturer had occasion to issue first year engineering student assessments to be completed on an individual basis?

A. Yes. Individual assessment is one of a variety of assessments I have had occasion to issue. Independent learning would form part of the requirement of an overall project.

Q. How do students respond to being given individual assignments to complete?

A. Ah. That’s a difficult one; you know some will give a positive response. In my opinion these would be the good students. One of the things that effects how they respond is the amount of work they may have ongoing for other modules and the amount of work required for the assignment you are giving them. If the student knows the assignment is summative, they tend to react reasonably positively to it. I find that young first year students don’t always respond well to formative assessments. They kind of look at you as if to say ‘why do I have to do this’; if I am not going to get any marks for it. They only want to do assessment for the purpose of getting marks. I find its important to explain to the student that the purpose of the assignments is to satisfy their learning need, not just so they can get the marks. If this is not done there can be issues with the students motivation.

Interviewer: Actually you already answered my next question.

Q. Does the assignment design influence their response? For example if the assessment is summative or formative.

A. In terms of that question there are also other assignment designs to be considered. The type of assignment will affect their response to it.
Q. What proportion of students do not meet the deadline for the completion of assignments?
A. That varies; most students will meet the deadline particularly if they are made aware that there are marks being given for the work. Mind you, I am of the view that if an assignment is due on a certain date I see submitting it on time as being an important part of the overall learning process, because if you go out into industry you have to get reports in on time. I would often highlight this for them and would threaten to deduct five percent of the marks if they didn’t have it in on time. In general, students are pretty good at getting assignments in on time.

Q. Have students who have not completed assignments provided reasons why, if yes please elaborate?
A. Excuses vary. Common excuses would be I lost it or I lost the USB it was on or my computer failed. The thing is you kind of know from experience whether or not the reason they give is genuine. If a student comes to me in advance to ask for more time and can give me a genuine reason why, then I would be lenient and give the extra time. However, if a student comes to me two days after the due date and says I forget about the deadline that is different. To be fair to the students the members of course boards need to timetable assignments due dates so they are spread out across the year, so that the students don’t get overloaded with assignments at any one time.

Q. Do you feel students are familiar with studying independently, are they aware of the need to study outside of class?
A. I think that when they leave secondary school they forget they need to study outside the class and they feel that what they do in class is enough to get them through examinations. What possibly is required here is some form of introduction to third level and how to work and study in third level on their own, because the students coming in don’t know each other. There is very little communication with one another and what communication is going, is about things other than study and learning. In general the students are not aware of their need to study on their own.

Q. Have students approached you seeking help with study skills?
A. No, however, I have offered guidance to students without being asked. Not every student is open to guidance when they come in first. They are very reluctant to ask any questions much less ask for help with study skills. There is an issue here, study skills modules need to be delivered early on in the programs.

Q. Autonomous learning is described as the learner’s ability to acquire knowledge or skills of value by processes that he or she determines. A measure of learner’s autonomy was developed in May of this year in the United Kingdom. Do you think that there would be merit in the measurement of each student’s autonomy at an early stage in the first semester?
A. Yes, and even based on the description you give, if a student is able to take control of their own learning than that’s an important part of going to university. So, I think that if we are going to be able to provide students with the ability to work on their own out in Industry then it would be very useful to know their level of learning autonomy when they come to us first. It would also be useful if we could find out from them how they themselves learn best, be it on their own or as a part of a group. That would be useful as part of the overall process.

Q. Which of the following do you feel present greater barriers to independent study and learning in first year engineering students most?

1. The lack of the students study skills.
2. The students lack of self motivation.
3. The distractions which occur during the onset of adulthood.
4. The student being in paid employment.
5. The student living away from home.
6. If in your opinion you believe there are other factors please elaborate.

A. It is very hard to pick out one of these Bob. One of the things that I found is that if you give an assignment to first years that they have to do out of class then the student being in paid employment is a problem. However, if the assignment is given in class at the end of a lecture and the student performs poorly then that’s a lack of study skills issue. In my experience the three main issues are lack of study skills, being in paid employment and the distractions of the onset of adulthood.

The last question is,

Q. Do you have any suggestions for survey questions relating to Barriers to independent study and learning that have we have not covered already in this interview and that would contribute to my research?

A. I have a couple of ideas most of which arose already. One was that you could ask students what kinds of study or if any they had been previously engaged in. It would be useful to ask them their age so that you could compare the data provided by the more mature students with the younger ones.

I know that its outside the scope of your research project but it would be useful perhaps as a follow up project to use that student learning autonomy measure to track the levels of autonomy learning through say one group of students over the three or four years of their program. I think the results would be very interesting. You could compare two groups, one which had taken a study skill module and one which hadn’t.

Thanks again for taking time out of your busy schedule to take part in this interview.
Appendix 7

Interview No 3 Transcription

Interview No. 3

Interview Date: 13th December, 2010, Interview location, D.I.T. Bolton Street

May I start by saying, thank you for agreeing to take part in this interview?

I would like to confirm that your identity will not be revealed and that this interview is being recorded for transcription purposes.

The title of my research thesis is “what are the barriers to independent study and learning in first year engineering students”

I plan to use this interview to draw on your considerable experience for guidance in the selection of questions which will be part of a quantitative survey to be completed by first year undergraduate engineering students.

At the end of the interview you will have the opportunity to make any suggestions you feel might contribute to this research.

The first question is,

Q. Have you, as part of your duties as a lecturer had occasion to issue first year engineering student assessments to be completed on an individual basis?

A. Yes.

Q. How do students respond to being given individual assignments to complete?

A. I think they seem to be used to it, they don’t see it as unusual. They don’t respond very much at all. One of the characteristics of first year students is that they are unresponsive.

Q. Does the assignment design influence their response? For example if the assessment is summative or formative.

A. I don’t give formative assessments. I would imagine that if I gave them assessments that they weren’t getting marks for they wouldn’t do them.

Q. What proportion of students do not meet the deadline for the completion of assignments?

A. Well, the assessments I give to first years I give under controlled conditions for the first semester. I get them to complete the assessments during a two hour period in the lecture room during scheduled teaching time. The reason for this is in my experience if I give new first year students an individual assessment and tell them it has to be in a week, the response is really poor.
I wait until the second semester before trusting them to do assessments on their own to a deadline. I find it works better giving them some time to get used to the way things work at third level.

Q. Have students who have not completed assignments provided reasons why, if yes please elaborate?
A. They never volunteer reasons. If I chase them and put them on the spot they might claim to have been ill, or to have forgotten the deadline. Students who come to me early on with genuine reasons for needing more time I generally will give them an extra week.

Q. Do you feel students are familiar with studying independently, are they aware of the need to study outside of class?
A. No. they are not familiar with doing it, because it’s not a feature of the second level environment they have come from and I think it’s one of the biggest problems with first years really. I make sure to tell them that they need to study independently. I try and get that message across. How I deal with first years is I try and give them a half way house between second level and third level just for the first semester. The majority of them don’t automatically go off and study on their own. As time passes over the last ten years I’ve noticed they need closer and closer guidance and supervision.

Q. Have students approached you seeking help with study skills?
A. Yes, but very few. There would probably be only about two or three out of a group of forty that would admit to you and themselves that they need help. In fact they turn out to be among the better students.

Q. Autonomous learning is described as the learner’s ability to acquire knowledge or skills of value by processes that he or she determines. A measure of learner’s autonomy was developed in May of this year in the United Kingdom. Do you think that there would be merit in the measurement of each student’s autonomy at an early stage in the first semester?
A. Yes. I think there would. I have a suspicion that the measure would identify they haven’t yet developed that ability. As I say, the students that demonstrate that ability to go off and learn by themselves are generally the older ones, like mature students or even those who have worked for a few years before deciding to come to College. I think the majority of school leavers going straight to College would measure low on the scale. It would help to highlight the need to
change the second level assessment designs towards a more project based continuous approach which would help to better prepare the kids for world of study and later for world of work.

Q. Which of the following do you feel present greater barriers to independent study and learning in first year engineering students most?

1. The lack of the students study skills.
2. The students lack of self motivation.
3. The distractions which occur during the onset of adulthood.
4. The student being in paid employment.
5. The student living away from home.
6. If in your opinion you believe there are other factors please elaborate.

A. I don’t think students’ living away from home is a factor. I think probably the more significant ones would be lack of motivation, lack of study skills and having jobs are all equally significant barriers. They miss lectures when they are in paid employment. I’ve found that the ones with jobs miss a lot of Friday afternoon lectures, their weekend work starts at lunchtime on Fridays. They might work is pubs or supermarkets. However, some have to do it but their work does suffer. If they didn’t work, some of them would be able to come to college.

The last question is,

Q. Do you have any suggestions for survey questions relating to Barriers to independent study and learning that have we have not covered already in this interview and that would contribute to my research?

A. I can’t think of any other significant issues which prevent students from studying on their own, however, it would be very worthwhile to examine first years performance statistics over the last 10 years. While filling out questionnaire forms I have noticed the performance statistics of first years has disimproved considerably over the past 10 years. The entry point on courses is certainly a factor. A few years ago we were taking in students to our engineering course with 350 points. Then over a period of 2 years the points went down as low as 150 points. This year it went back up to about 230 points. I think they should take fewer students with more ability so that we can give them more time. I am finding that dealing with first years is becoming a real battle. They just seem to be less able to deal with the demands on them than they used to be. A lot of work needs to be done to improve the way we prepare kids for college. They need to be
taught more about studying and learning and seeking out information on their own. It all stems from how they are assessed in the Leaving Cert.

Thanks again for taking time out of your busy schedule to take part in this interview.
Appendix 8

Interview No 4 Transcription

Interview No.4

Interview Date 13TH January 2011. Interview location D.I.T. Bolton Street, Dublin 8

May I start by saying, thank you for agreeing to take part in this interview?
I would like to confirm that your identity will not be revealed and that this interview is being recorded for transcription purposes.

The title of my research thesis is “what are the barriers to independent study and learning in first year engineering students”
I plan to use this interview to draw on your considerable experience for guidance in the selection of questions which will be part of a quantitative survey to be completed by first year undergraduate engineering students.
At the end of the interview you will have the opportunity to make any suggestions you feel might contribute to this research.
The first question is,

Q. Have you, as part of your duties as a lecturer had occasion to issue first year engineering student assessments to be completed on an individual basis?
A. Yes.

Q. How do students respond to being given individual assignments to complete?
A. They seem to be happy enough. The stronger ones see it as an opportunity to demonstrate that they know what they are doing. The weaker ones would prefer if it was a group activity, that way the onus would not be on them to individually perform. But generally speaking they are happy enough to do individual assessments. They see it as a means of letting me and them see what they are capable of doing.

Q. Does the assignment design influence their response? For example if the assessment is summative or formative.
A. Ok, well of all of the assignments that I would give out if first year, there would be five or six that are all summative, they carry marks. However, some of the better students and non-national students come to me asking for formative feedback in advance of the deadline. Other students who are less organised would be driven by the deadline with the result they don’t get any formative feedback. They just hand up what they have and they are marked on that, so there is
no official formative assessment, but formative feedback is available to those who come looking for it in time. A lot depends on their time management. The deadline is the deadline.

Interviewer: The next question is about deadlines.

Q. What proportion of students do not meet the deadline for the completion of assignments?
A. On my first deadline, 15 to 20% might have a difficulty, however by the second that would be eliminated because I have a very strict policy on it. If they are late they get no marks. A lot of students don’t believe this until it’s implemented. I view it as preparation for second year as then you could lose one third of your marks for the year if you miss a deadline. Sometimes I would make exceptions on the first assessments, but never on the second, unless the student is genuinely sick or has a genuine reason for not getting it done on time. I actually let them set their own deadlines within a certain period, and then I enforce them. I do this because they usually complain if say for example, if the deadline is two weeks, I say that if I give them five weeks, you are only going to do the assignment in the last two weeks of the five. So I let them pick the deadlines and I enforce them.

Q. Have students who have not completed assignments provided reasons why, if yes please elaborate?
A. Yes, of course they have but having been a student myself for a long time I know nothing has changed.

Q. Have they ever informed you of what they might be?
A. Excuses given include the printer or the computer broke down the night before and is being repaired. I couldn’t finish it because my parents were coming back from holidays and I had to tidy up the house. There is rarely a genuine reason that affects them working on the assignment. It is usually an excuse that offsets the fact that the assignment just wasn’t done, but again if the deadline is enforced you don’t get any excuses. Obviously if there was sickness or some major difficult of course I’ll consider it, but I’ll have to have a reason in writing to be fair to the other students. In terms of excuses there is nothing new. I never get a plausible excuse why an assignment is not done. However, I can’t even think of one myself.

Q. Do you feel students are familiar with studying independently, are they aware of the need to study outside of class?
A. The difficulty is that under the current system students believe that if they turn up they are almost entitled to a qualification. The general attitude is that it’s a process; you’re going to get the marks you’re going to get. However, some students might be proactive and ask questions and if you say “If you’re interested in that you should look it up” quite often they will and come back to you to discuss what they found. These students have an automatic ability to do their own study. The problem is it’s very difficult to change their tendencies by the time they reach third level, so there is a wide range. Again I would have to say in my experience non-national and mature students seem to be very applied. They would ask you a question in class and after going away and researching the topic they would come back looking to discuss it further, so you have to be on the ball. I don’t know why that difference exists; the remainder of the students just feel that they are going to get sufficient information from the notes and the lectures to get a pass. That’s why as part of the assignments I require them to seek out information by looking up the text books. The marks then directly reflect how much they are able to glean. If they just repeat my notes that is not sufficient. The students that have supplemented my notes with relevant research and references they are the students who get the high marks. This is highlighted in the instructions for the assignments.

Q. Have students approached you seeking help with study skills?
A. Yes, they have indeed. Again it is usually the students that need it the least who come and ask. Those who need help would rarely ask for it. I don’t think they realise the benefit of study. They seem to have trouble relating independent study with the marks they can get if they do it. They are trained from second level that if they sit in the class and absorb the material they will get a direct mark on what they are able to repeat. It’s a new thing for them when they come in to college to be expected to provide information in assignment which they have not been. It takes them until second year to kip on that extra marks are available for providing this extra information that hasn’t been given to them by the lecturer.

Q. Autonomous learning is described as the learner’s ability to acquire knowledge or skills of value by processes that he or she determines. Do you think that there would be merit in the measurement of each student’s autonomy at an early stage in the first semester?
A. Definitely yes. Although I have no idea of the accuracy of the measure or its effectiveness. That would have to be proven.

Interviewer: It has been.
Has it? I would say that if you asked most lecturers after getting to know the students for about four weeks to give a guess at how they would perform in a test at the end of first year, they would be able to give you a good idea. If this measure is a scientific more structured way of assessing that kind of thing it would be very useful, particularly if it was used to be able to identify the students so that they could be told they needed to adjust their behaviour or you will actually be wasting your time here. However measure would need to be proven.

Interviewer: The researchers who developed this measure used the experience and expertise of a number of experience lecturers to confirm the accuracy of the measure by means of comparison. I have had experience of some systems and I would say that they were very questionable. I have to point out that in the past, after making an early judgement on a student I have been pleasantly surprised to have been proven wrong. It has happened that after marking an exam paper anonymously where the result was a very good mark, I discovered later that the exam paper was done by someone you didn’t expect. Then yes, if I was satisfied the measure was accurate I believe there would be merit in using it.

Q. Which of the following do you feel present greater barriers to independent study and learning in first year engineering students most?

1. The lack of the students study skills.
2. The students lack of self motivation.
3. The distractions which occur during the onset of adulthood.
4. The student being in paid employment.
5. The student living away from home.
6. If in your opinion you believe there are other factors please elaborate.

A. I’ll go down along them and tell you as I go.

The first one there, the lack of student study skills, in my experience, students who score highly in the leaving certificate already have some sound study skills. However, students who don’t score very high lack these skills. Often time these people are quite intelligent they just don’t know how to put it to good use.

The lack of students motivation is of course a big issue, everybody who has ever studied has had times when they sat down with the books to study and thought to themselves “I do not want to do
this” so that’s always difficult but the interesting thing is it’s at this time that your motivation level dictates whether you get on with the study or not.

Distractions will always be present regardless of if you are young or old. What I say to students is how dedicated are you on what you want, how focused are you on what you want and that’s what makes the difference if you are not focused you will be open to distractions. I suppose it goes back to motivation.

Students being in paid employment I don’t see that as being a major problem. The proof of that is clear to see with part time programmes that have whole time parallel courses running during the day and I have personal experience of this. The higher marks in the whole time programme will correspond with the lower marks of the part-time programme. Part-time students in full-time employment often score higher than whole-time students who are not in employment.

Students living away from home; depends on the personality. Some people perform much better when they get out of the home. They’ve got something to prove. When I was in my early twenties I moved away from home but the place I went to live in didn’t suit me, I found it easier to study at home. So I suppose living away from home was a barrier to my study and learning, however that was just my experience.

Other factors, yes, one of the most significant influences on a student study is who they select to pal around with. If they decide to become friends with people with a low motivational level the influence will be a negative one on them. If they pick out people with high motivation levels to be friends with you are less likely to be thinking about the guys who are out partying. In my experience Group Dynamics can get built up where people get an interest in doing very effective studying. It has a massive effect where people tend to perform beyond their normal abilities.

The last question is,

Q. Do you have any suggestions for survey questions relating to Barriers to independent study and learning that have we have not covered already in this interview and that would contribute to my research?

A. One thing is, is there any way we could get students to give more thought to the long term goal. They seem to do things in a linear fashion focusing on the end of first year for example. The first week all I have to do is get inducted. The second week all I have to do is get this assignment in, and so on. Where as in actual fact if we could get them to focus on the aim of graduating with high mark. Unfortunately, by the time the student with the ability realises he or
she should have been thinking long term it is often too late. If they were focused on the long
term goal they would appreciate that self directed learning is essential to get them that goal. It
would be of great benefit to them if they could start self directed learning early it would benefit
them long into their working careers. I would like to see some research into what motivates first
year students.
Thanks again for taking time out of your busy schedule to take part in this interview.
Appendix 9 The Student Survey.
### Questionnaire

#### 3. Age

<table>
<thead>
<tr>
<th>Between 18 and 21 Years</th>
<th>Over 21 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**a. Please state your age.**

#### 4. Origin

<table>
<thead>
<tr>
<th>From the Republic of Ireland</th>
<th>From another country</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**a. Are You?**

#### 5. Gender

<table>
<thead>
<tr>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**a. Are you male or female?**

#### 6. Additional Questions

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**a. Are you living away from home while attending college?**

**b. Have you ever been taught any study skills or attended a study skills class?**

**c. Are you aware that there is a study skills class available to you?**

**d. Are you in paid or unpaid employment?**

---

[https://www.survey.briss.ac.uk/?manifestid=69042&op=preview](https://www.survey.briss.ac.uk/?manifestid=69042&op=preview)  
01/07/2011
7. If you answered “Yes” to the last question please select the number of hours you work each week:
   - 0 to 10 Hours
   - 10 to 20 Hours
   - Over 20 Hours per week

8. Do you study on your own?
   - Yes
   - No

If you answered “No” to the last question please skip to Section 13. If you answered “Yes” please continue.

9. Please state where you study most on your own? i.e. at home, in college, or in another location.
   ____________________________
   Which days of the week do you study on your own?
   - On weekdays
   - At weekends
   - Both

10. How much time do you spend each week studying on your own?
    - 0 to 2 Hrs
    - 2 to 4 Hrs
    - More than 4 Hrs

11. Do you think you spend enough time studying on your own?
    - Yes
    - No

12. Does the time you spend studying increase the closer it gets to exam time?
    - Yes
    - No

13. When given an individual assignment do you
    - Spread the work for it evenly over the time available
    - Leave the work until near to the time it is due
    - Check with your classmates before deciding when you will start it

14. Did you do the Leaving Certificate Examination?
    - Yes
    - No

15. If you did the Leaving Certificate Examination, how many CAO points did you get?
    - 0 to 250 CAO points
    - 250 to 400 CAO points
    - Above 400 CAO points

https://www.survey.bris.ac.uk?manifestid=62042&op=preview
01/07/2011
16. Which of the following best describes you?

<table>
<thead>
<tr>
<th></th>
<th>1. Not at all like me.</th>
<th>2. Quite unlike me.</th>
<th>3. Neither like me or unlike me.</th>
<th>4. Quite like me.</th>
<th>5. Very like me</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>I enjoy finding information about new topics on my own.</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>b</td>
<td>I frequently find excuses for not getting down to work.</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>c</td>
<td>I am good at meeting deadlines.</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>d</td>
<td>My time management is good.</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>e</td>
<td>I am happy to work on my own.</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>f</td>
<td>Even when tasks are difficult I try to stick to them.</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>g</td>
<td>I am open to new ways of doing familiar things.</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>h</td>
<td>I enjoy being set a challenge.</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>i</td>
<td>I plan my time for study effectively.</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>j</td>
<td>I tend to be motivated to work by assessment deadlines.</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>k</td>
<td>I take responsibility for my learning experiences.</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>l</td>
<td>I enjoy new learning experiences.</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
</tbody>
</table>

To complete the survey please click on the "Check Answers and Continue" button

Continue >

Survey testing only

Check Answers & Continue >
Appendix 10
Analysis of the Student Survey Data

Age Profile of the Students Surveyed.

- Aged between 18 and 21 years, 90%
- Over 21 years of age, 10%

Gender of the students surveyed.

- Male, 90%
- Female, 10%
Employment status of the Students Surveyed.

- Students in employment, 38%
- Students not in employment, 62%

Number of hours per week worked by students in employment.

- 0 to 10 Hours, 9 of the 19 students in employment.
- 10 to 20 Hours, 7 of the 19 students in employment.
- Over 20 Hours, 3 of the 19 students in employment.
Living arrangements of the students surveyed.

Students living away from home while attending college, 44%
Students living at home while attending college, 56%

Students CAO Points level

0 -250 Points 8.3%
250 - 400 points 64.6%
Above 400 points 27.1%
Study Skill Training.

- Students who had received some study skills training, 52%
- Students who had never received study skills training, 48%

Students studying alone.

- Students who study alone, 96%
- Students who do not study alone, 4%
Study location.

- Students who study alone at home, 63%
- Students who study alone in college, 33%
- Students who study alone both at home and in college, 4%

Days of week students study.

- On weekdays, 64%
- At weekends, 32%
- Both on weekdays and at the weekend, 4%

Note: Chart is representative of the 96% of students surveyed who spend time studying alone.
Time students spend studying alone per week.

- 0-2 Hrs, 37% those who don't study are included in this group.
- 2-4 Hrs, 51%
- Over 4 Hrs, 12%

Students perceptions of whether they spend enough time studying alone.

- Students who don't think they spend enough time studying alone, 77%
- Students who think they spend enough time studying alone, 23%
Students aproaches to studying for individual assignments.

- Students who spread the work over the time available, 30%
- Students who leave the work until close to the time it is due for submission, 68%
- Students who ask classmates before deciding when to do the work require for the assignment, 2%