

MSc Computing: Final Project Report

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How Can Technology Be Used To  
Motivate Learners In Higher  
Education?

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## Abstract

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As Petty (1998) states, "Motivation is regarded by experienced and inexperienced teachers alike as a prerequisite for effective learning." Arguably the greatest challenge any teacher faces in all levels of education is to motivate their learners and keep their learners attentive and working at their highest levels for long periods of time, Without motivated learners it is very difficult to ensure that learning takes place in each and every session.

Furthermore with greater amounts of learning taking place outside of the traditional confines of the classroom, be that in seminars, libraries and study groups, or as is more often the case in the 21st Century, using online and virtual learning environments, these self same learners need to be motivated to work as independent learners.

This research project presents the findings of a study undertaken into the use of technology within a new Higher Education establishment in Coventry, UK. The study was undertaken in Spring 2013 where 209 students across seven different subjects areas were surveyed into their use of technology and its impact on their motivation within their chosen study area.

The project looks at what types of technology are used most, with particular focus on hardware, software and web based. It looks at what types of technology the students personally prefer and what types of technology have the most preferential effects on student motivation.

The project presents findings showing how the modern learner is becoming more and more inclined to wanting interactive lessons along with video and audio recordings of lectures to watch and listen back to in their own time. The project also shows how new hardware technologies such as smartphones and tablet computers are also at the forefront of the modern student's mind when it comes to what technology they want to use and what technology can best motivate them in their learning.



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# 1 Introduction

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*This chapter will introduce the topic of this research, and outline the aims and objectives of the project.*

## **1.1 About this Research Project**

This research project will be looking at the use of technology in teaching and learning from both the learner and teacher perspectives. The specific area of interest is the motivation of learners, from a motivational research perspective and how technology can be used in the teaching process. The subsequent report will explore how technology can be used to reinforce prior learning both in classroom and remote learning scenarios, be that distance learning or additional studies, aka 'homework'.

This report will look at the ways technology can be used by the two main stakeholders in the education process, namely the teacher perspective and the learner perspective.

Teachers can use technology to add to and aid their teaching, and learners can use it in their day to day learning, often improving their learning experience as well as reinforcing further additional learning outside the classroom environment. However there can also be negative connotations to the use of technology, which also need to be researched and critiqued.

As Armitage et al (2003) write:

“Recent years have witnessed a dramatic increase in the impact of IT both in the production of teaching and learning resources and on the nature of those resources themselves. This is no doubt partly because of the potential IT possesses for improving the quality and effectiveness of learning resources as well as the obvious virtues of automation, capacity, interactivity and ‘provisionality’ (the relative ease of changing a learning resource). However, there must surely also be a case for IT being seen as a means of delivering learning to yet greater numbers of students, in a more flexible and cost-efficient manner. Preliminary research (e.g., the ‘TILT’ (Teaching with

Independent Learning Technologies) project) indicates that IT can be a valuable learning resource in particular subject areas rather than all aspects of the curriculum.”

Much of the motivation theory available today comes from a very business centred stand point with the likes of Maslow (1943), McGregor (1987), Mayo (1932) and Herzberg (1959) all working with motivational theory in practice in the workplace. In addition to this a lot of the works previously carried out have come from a transatlantic (American) standpoint. However, this report will work on the premise that ‘people are people’ and students have the same substantive needs for motivation that workers do in business environs.

Motivation itself can be seen as the desire to do something or an interest and drive to do something, therefore in education this is a crucial requirement for active learning to take place. As Petty (1998) states, “If you know how to motivate students, you can hugely increase their learning rate.”

The education specific theorists, such as Reece and Walker (2003), Armitage et al (2003), Rebolledo-Mendez et al (2010) and Petty (1998), believe that all of these business founded motivational theories (in conjunction with each other) can also apply to the motivation of learners. However the critically reflective teacher must constantly seek to learn how best to use existing theory on motivation, classroom management and learning styles for the specific needs of the learners being taught on a day-to-day basis. More and more this now includes the use of technology to support learners and learning.

This research project and subsequent report will look to address the following aim and objectives.

## 1.2 **Aim**

The aim of this project is to research and critically compare specific areas in which technology can be used to improve the motivation of students within a Higher Education setting.



### 1.3 **Objectives**

The objectives of the project are to:

- ◆ Review the current academic literature pertaining to the motivation of students
- ◆ Identify areas throughout a learner's education where technology can play an active and important role in motivation and retention of learners
- ◆ Identify technologies that can be utilised to support and enhance a learner's education
- ◆ Develop primary research tools to ascertain where and how technology can be used to support and enhance a learner's education
- ◆ Undertake primary research and evaluate the results
- ◆ Make further substantive recommendations for where and how technology can be best used to support and enhance the education of Higher Education learners.

This project intends to complete these objectives with the utilisation of both Primary and Secondary Research as shown in the following chapters.

### 1.4 **Structure of Report**

The following chapters of this report contain a literature review of motivational theory, motivation specific to education, technology to support learning and technology to motivate learners. Following this will be details of the research methodology used in this project and further details of the specific demographics of the study.

There is then a chapter presenting and analysing the data resulting from the research undertaken, followed by the final chapter detailing conclusions, recommendations and reflections on the project in its entirety.

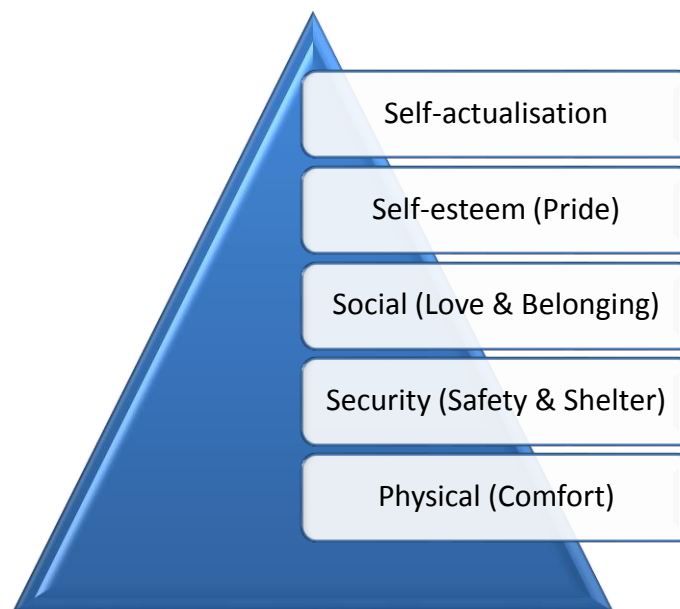


## 2 Literature Review

*This chapter will look at the existing literature in the fields of motivation, motivation specific to educational studies and technology to support learning.*

### 2.1 **Motivation Theory**

In the first half of the 20th century sociologist Maslow (1943) proposed that all humans have universal needs and that said needs could be categorised into a hierarchical structure. Maslow labelled the five categories as: physical, security, social, self-esteem and self-actualisation



**Figure 2.1: Maslow's Hierarchy of Needs**

Maslow theorised that each underlying need had to be satisfied before the subject could move onto what he saw as a more prominent need. For example it would be almost impossible to achieve success in higher education if one was not properly fed and watered in the first place.

This theory has great impact on educational structure. In order to maximise on the effectiveness of institute-wide and individual classroom teaching programmes teachers in particular must consider students' needs and their hierarchical order. Maslow's work says that this must be a top priority in the

development of any programmes so that students have the capability of reaching their highest levels of potential. For instance, if a student has not had breakfast they will be preoccupied with the need for food ahead of being able to learn anything.

McGregor (1960) identified what he saw as two theories on an individual's behaviour in the workplace: Theory X and Theory Y.

Theory X assumes that humans have an inherent dislike of work and will avoid it if at all possible. Due to this dislike of work, people must be controlled and threatened to work hard enough. Theory X also assumes that the average human dislikes responsibility, prefers to be directed and desires security above all else. Theory Y assumes that humans will direct themselves if they are committed to the goals of the organisation. It also assumes that if a job is satisfying, the result will be commitment to the organization and under the proper conditions, humans will seek responsibility.

To this end McGregor suggests that dependant on which type of employee (or in the case of education, learner) you have, this should directly determine the style of management (teaching) that should be given in order to attain the best results.

Prior to this however, Mayo (1927) performed research on human relations and motivation theory at the Hawthorne Works of the General Electric Company in Chicago in the mid 1920's. From his research, it was found that work is what he called a group activity. The need for recognition, security and a sense of belonging is a greater factor in moral than physical conditions of the workplace. Complaints are often symptomatic of disdain over an individual's status and position at work. Social demands both inside and outside the workplace, the latter being uncontrollable, contribute to the attitude, effectiveness and thus motivation of an employee.

Contrary to this, Herzberg's (1959) theory on human relations and organizational motivation includes two components: hygiene and motivation. Unlike Mayo, Herzberg believed that both approaches must be executed simultaneously to achieve the desired outcomes.

Hygiene theory refers to the work environment and includes the organization, its policies and administration, the type of supervision employees receive, working conditions, interpersonal relations, status and security, whereas, motivation refers to the actual 'on the job' activities. These include recognition, interest and opportunity for growth. The underlying theory behind this two-pronged approach is to treat employees as well as possible, minimizing dissatisfaction. When people receive recognition for achievement, it drives interest and a sense of responsibility, allowing the individual to grow and advance in their work.

## **2.2 Motivation in Education**

All of the above literature however, as previously stated, is based upon research undertaken in business within a 'working' environment, and although much of this more humanistic theory has been adapted to the education sector, most notably Maslow's work, there are other bodies of work that can be explored which have their grounding in Education initially. It can however be said that the majority of this work is grounded in the primary and secondary environments and indeed there is little if any work on motivation and 'capture' of students within a higher education environment available at the time of writing.

It does seem somewhat inappropriate only to use purely, the aforementioned, humanistic approach to motivation, as there exist further behaviouristic works, such as those of Bandura (1982) and the theory of social learning and self-efficacy. This theory looks at the learner's self-regulation, exploring how a sense of 'self' influences the choice of activities to be undertaken, how much time the learner is willing to spend on the activity and how persistent the learner will be in accomplishing the desired end product of the activity.

Another aspect of self-efficacy is attribution theory. This demonstrates that a student's internal or intrinsic sense of self belief, in working hard to achieve a goal are the determining factors in whether or not the learner will succeed. Studies have focused on goal orientation and the idea that motivation is determined jointly by the expectation that the effort will lead to the goal and that as some may say, more importantly, the goal is worth attaining. The

'goal' however can be either a tangible item or more 'extrinsic' feeling of worth or achievement such as those Maslow discusses in his hierarchy of needs, once the physical and security requirements have been attained.

Finally there is the constructivist approach to learning theory and thus learning styles. Dewey (1938) was one of the first to enunciate clearly this idea that learners 'construct' knowledge for themselves and that each learner individually constructs meaning to a subject as they learn. The key principals being amongst others, learning is an active process; the learner needs to have the feeling of doing something or they will not feel as if they are learning.

People learn to learn as they learn. Learners create patterns in their own head explaining what they've learnt and how they learnt it in order for them to repeat the exercise. Learning is a social activity being intimately connected with all the learner comes into contact with. Whereas traditional education has always been very insular it can now be seen that learners absorb more of their surroundings along with their learning, leading onto learning being contextual depending on where the learner is and why are there.

On top of all of this comes the key component of motivation. Not only is it the case that motivation helps learning, it can be said it is essential for learning to take place. This also includes an understanding of ways in which knowledge can be used, As Knowles (1983) amongst others discuss "Unless we know the reasons why, we may not be very involved in using the knowledge that may be instilled in us"; even by the most severe and direct teaching.

In summation, there are hundreds if not thousands of researched papers and books on motivation in various walks of life with the vast majority being based in the business world. The above has however looked at what many others would see as the key theories and the theories that can best be translated into the education sector. Maslow's hierarchy of needs explores the needs of the individual to gain universal needs, whereas McGregor focuses on what he believes is human nature's intrinsic dislike of work. Mayo's work believed that security and recognition are all a person needs where as Herzberg's

believed that on top of this the person needs the basics of a Maslow like hierarchy to be motivated.

The education specific theorists seem to believe that all of these approaches (in conjunction with each other) can apply to the motivation of learners. However the critically reflective teacher must constantly seek to learn how best to use existing theory on motivation and classroom management and learning styles for the specific needs of the learners being taught on a day-to-day basis.

### **2.3 Technology to Support Learning**

Selwyn (2011) states, “digital technology lies at the heart of contemporary education provision.”

Technology itself (in more analogue forms) however has always been around in teaching and learning arenas; it is not a new phenomenon. Whether that technology is pens and paper or computers and software; or even advanced robotics, Computer Aided Design (CAD) and 3D imaging it has always existed in education in one form or another.

Humans have always striven to learn. For the past 2 million years the human race has been identified by its ability to learn for the sake of survival as well as self-improvement. Humans have therefore always found new tools in order to undertake this process. The process itself has then also become fundamental to the improvement of humans as a species. All of these tools can be seen in some way as technology.

So it can be said that technology is not just machinery and material artefacts as summarised by Lievrouw and Livingstone’s (2002) description of “three distinct but interconnected aspects of what technology is:”

- *Artefacts and devices: that is the technology itself and how it is designed and made;*
- *Activities and practices: that is, what people do with technologies (including issues of human interaction, organising, identity and cultural practices);*

- *Context: that is, social arrangements and organizational forms that surround the use of technologies (including institutions, social structures and cultures).*

*(Taken from; Selwyn (2011) p.8)*

However the past 40 years have seen such vast improvements and advances in technology that now there is a whole new view of what technology is and how it can be used to support learning.

2013 marks the 40th anniversary of the first mobile telephone call being made, and 40 years later mobile telephones are ubiquitous in the western world. *Indeed the research carried out in this report shows that some 80% of the learners surveyed now own a smartphone, able to utilise the power of the Internet in their pocket.*

Indeed a simplified version of Moore's Law (1970) states that "*processor speeds, or overall processing power for computers will double every two years.*" This in itself can partially explain why the past 40 years has seen such a massive change in the use of technology to support learning. And in conjunction with this the past decade has seen the rise of social networking on the Internet, alongside and even prior to this there has been blogging, personal websites, wikis and file sharing. There have been hardware developments making personal computers cheaper and more readily available. Laptop computers in conjunction with 3rd and 4th generation Long Term Evolution (LTE) Wi-Fi make access to personal documents and the Internet available more reliably and portably. Tablet computers have taken this to a new level of portability. Virtual Learning Environments (VLEs) such as Moodle and Blackboard are bringing the classroom into every device that has access to the Internet. Cloud services such as Dropbox, Google Drive and Microsoft's SkyDrive have made storing documents, music, or even programs in the 'cloud' possible without need for physical media to hold them. And there is now a rise of Massively Open Online Courses (MOOCs) through consortia such as Coursera and FutureLearn.



To this end the discussion of digital 'technology' can be seen from three distinct viewpoints, those of hardware, software and internetworking (the Internet).

Arguably the area in which most educational changes have occurred is the latter Internet and web products; as well as services. The internet and more specifically worldwide web, has led to many beneficial changes to education, along with some less desired effects, such as (but not limited to):

- Access to scholarly articles through web searching
- The ability to share resources electronically with learners
- The ability for learners to communicate and share knowledge
- The ability for educators to easily share best practice
- Availability of remote and distance learning
- Education becoming more 'social' out of the classroom environs

It is this socialisation of education being brought about by the worldwide web that Shirky (2008) states leads to much digital technology being seen as 'a hybrid of tool and community'.

As the development of digital technology continues over the coming years it is likely to only see a further convergence of technologies bringing more people 'closer together' and able to communicate with each other more readily. The physical capabilities of devices become secondary to their ability to connect to other (and potentially more powerful) devices. This will allow users to access their education where they want to and when they want to. It could therefore appear as if the educator and traditional lesson or lecture will die out, however this is not the case. Education however will need to adapt to the new technological advances and in many cases already has (or is currently doing so).

As Luckin (2010) writes, and has previously been identified, technology describes a whole range of different devices and applications. The concern therefore becomes what is the role of technology to the learner and in the learning process. Luckin goes on to assert that there has been a trend away from theories concerned with seeing the learner as a sole entity, or lone

individual, and towards those that embrace the social aspect of learning, viewing learners as social creatures and thus achieving greater learning when they act to type and learn socially and interactively. To this end the role technology can play in the learning process is great in so much that it can break down social and geographic barriers to learning. In fact learners no longer have to be in the same class, year group, subject cohort, establishment or even country to be able to share learning with one another.

As Sharpe and Beetham (2010) state, there have been few investigations of how approaches and conceptions of learning are influenced by the online environment. However they go on to recognise that e-learning, far from being seen as a separate way of learning as the name might suggest, but is in fact in today's educational systems merely a normal part of the learning process, and thusly uses and is informed by the same cognitive and pedagogic ideas of education as any other form of learning.

#### **2.4 Technology to Motivate Learners**

It has previously been shown from the aforementioned literature how technology can be used to support learning, so the question then has to change somewhat to become, 'can technology also be used to motivate learners?'

Min Liu's paper (2005) discusses how technology can be used as a way to address some of the challenges of implementing problem based learning scenarios in education. Indeed Min Liu builds upon the recommendations of Hoffman and Richie (1997) where they recommend the use of hypermedia to help "students comprehend the situation and see the relevance of various contextual elements", as they are cognitive tools that can support learners in their studies.

Liu's own research using *Alien Rescue* a problem based learning programme / computer 'game' on sixth grade students in the US, concludes that the students involved in the study did "significantly increase their knowledge" and that their attitudes towards the subject they were learning and goal

orientation were higher, after using *Alien Rescue*. Interestingly, and perhaps counter-intuitively the “few negative responses were from boys” in this study.

Blumenthal et al (1991) had also previously discussed Problem Based Learning, and more specifically Project Bases Learning as Motivational in their paper for the Educational Psychologist. In it they state that Project Based Learning differs from traditional learning in so much as it gives the learner a driving question (or questions) to be answered and then allows the learner more freedom to pursue their own learning in finding the answer. It could be said that this freedom and element of independence along with making activities ‘fun’ for the learner are possibly driving factors in keeping the learner motivated to achieve their educational goals.

Blumenthal et al however do go on to state that the question being answered must not be “so constrained that the outcomes are predetermined, leaving the students little room to develop their own approaches to answering [it / them].” These project based learning solutions are not without their own problems however, not least the time and organisation involved in running them, or the amount of teacher intervention required to ensure those involved in such a project is engaging the correct cognitive functions of the brains to make the intended learning viable and accurate.

Blumenthal at al then go on to say that “one of the major educational developments ... that has the potential for fostering project based education in the creation and expansion of new technology tools.” Whilst this was being written in 1991, it was clear that what was being referred to is what is now know as the ubiquitous computer its associated inter-connectivity and programmes.

Moss and Honkomp (2011) wrote very similarly to Blumenthal et al that “positive feedback on technology in the classroom” was received during their own studies into ‘adventure learning’ and this led to “a strong effect of adventure learning on student motivation.” From the discussions of this research it is noteworthy to mention that, “several students went on to indicate that the Internet is a digital media that is a comfortable and expected

part of their lives.” This can be seen as a profound turning point in education as most of the learners now in the educational systems of the western world are ‘Net Native’, in so much as not only is digital technology something with which they have always grown up and they do not have any recollection of a world without digital technology, but moreover the Internet is similarly something with which they have also always grown up.

In conclusion to Moss and Honkomp’s research they do state that the Adventure Learning undertaken had shown a “positive effect on students’ feelings of competence, autonomy and relatedness,” but “the extent of these relationships is unknown.”

A further study based in US classrooms, similar to that of Liu and Moss and Honkomp, by Baylor and Ritchie (2001) concludes that, “simply placing technology in schools does little to increase student learning.” Baylor and Ritchie go further however in stating that there are three variables that are important in analysing the impact of technology on learning. These three variables are;

- 1) The strength of technology leadership at a school
- 2) Teacher openness to change
- 3) *Negatively influenced* by teacher non-school computer use

This latter variable is particularly interesting in so much as if the teacher does not use the provided technology then the research suggested that the content acquisition was not as high as when the teacher did use the provided technology. The same study also found that the effect on higher level thinking studies as can be applied more readily to Higher Education was similarly impacted. The study states that they “found a strong positive relationship between teacher who had higher degrees of openness to change and the impact of technology on students’ higher-order thinking skills.” With specific regards to technology integration in lessons this research goes on to conclude that “integrative lessons often provide students with greater challenge in the form of research, exploration and expression.”

Another study in a similar vein by Heafner (2004) examined the use of technology to support a previously unmotivated Social Studies class. In it she worked on two propositions; (a) *Technology improves students' motivation to learn content and (b) technology augments the development of students' work through providing students with organisational frameworks, connect students to resources and supporting students' creativity.* This research found that the same students that had been unruly, and unmotivated whilst working on an activity in small groups sat at traditional tables using paper, pencils and textbooks. When given the same task but taken to a computer lab the “students immediately sat down at their computers and promptly began their work.” Furthermore she goes on to say that the “students exuded self confidence [whilst using the computers] in their abilities not only to work with the technology but to master the content and successfully complete the task.” It was reported that the students “enjoyed working on the project with technology because they viewed technology as more engaging.” And students themselves reported that, “using technology enabled them to find more information and helped them to understand what they were talking about in class.”

Heafner observes that, “technology offers many benefits to enhance education”. Technology can empower students and allow them to engage more deeply in the educational and learning process, building on the constructivist theories of motivation. Technology can make the learner feel more capable of completing the tasks they are set, especially those that are *'Digital Native'* or *'Net Native'*. Technology allows these learners to take more pride in their own output and accomplish more to be able to work towards achieving the self-actualisation of Maslow's Hierarchy of Needs.

Technology in itself does not achieve any of these things alone however; technology is merely a tool that can be used to assist in the teacher's aim of learning taking place.



## 3 Research Methodology

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*This chapter will look at the research methodology used in the planning, conducting and writing of this research project. It will look specifically at why the research methods chosen were used, and how they were designed for specific use in this research project.*

### 3.1 **Methodology**

This research has looked at existing writings on the subjects of motivation and participation within the Higher Education sector, along with primary research undertaken at a new Higher Education establishment.

The Primary Research consisted of survey questions and was responded to by students currently learning in a Higher Education establishment, enrolled on both Foundation (Level 3) and First Year Undergraduate (Level 4) degree programmes. *The survey used can be seen in Appendix A.*

The Primary Research was undertaken at Coventry University College, West Midlands, UK. Coventry University College is one of a new breed of private universities in the UK. It offers degree programs in several disciplinary areas, namely; Accountancy, Banking, Health and Social Care, Information Technology, Legal, Management, Science and Engineering & Travel and Tourism. Coventry University College offers a very different academic structure to traditional universities in the UK, with more intensive learning, flexible learning options (including evenings and weekends), distance and online learning and professionally accredited courses. Coventry University College offers vastly reduced fees, which it is able to do due to its flexible approach and 'no frills' nature, not suffering the costs of having expensive halls of residence, canteens, fitness suites and student rest, relaxation and social facilities. To this extent it is expected that a large number of the cohort at Coventry University are from more deprived and underprivileged areas, mainly 'local' students and mainly students with a greater need for more tutor support during their studies.

The reasons why a survey was chosen for this research were several. Firstly time being an issue a survey was chosen as a fast and efficient way of getting a large number of responses in a short period of time, at low overhead cost. The survey itself could be conducted with minimal interruption and involvement of the 'interviewer' and therefore avoid interviewer bias. The survey could be tabulated into measurable statistics for quantitative analysis. As the research was focused on gaining opinion as well as a majority of facts about the subjects' use of technology in learning a survey was seen as the best method to use in this instance.

Had there been considerably more time available and overhead costs were less of an issue then it would have been worthwhile investigating deeper and more probing questioning with face-to-face interviews, however this was not deemed possible within the time and budget available.

The research survey used was presented to small groups of up to 50 students at a time over a one-week period. It was decided to do this in person on paper as opposed to one of the many online survey tools, such as survey monkey for a number of reasons.

Whilst online survey tools are easy to use and make collation of the data returned considerably easier than manual data input and sorting, the response rates are significantly lower than if the researcher is able to meet with the subjects face to face, explain the reasons for the survey and ask the subjects to complete the survey there and then.

As it was possible to do the latter option it was decided that this would be a better way of achieving a high response rate with a relatively small potential sample size (approximately 250 HE Students). Indeed the response rate in doing the surveys in this manner was over 80% with some 209 subjects completing the research survey over this period of time.

The questions were specifically chosen for various reasons. The sample being from across the entire University it was wanted to be able to separate the respondents out by subject and level of study to see if there were many discernable differences between these. The respondents socio-economic



grouping and living arrangements could determine if certain groups had less access to technology (both hardware and internet access). Age grouping and gender were also asked to see again if there were any discernable differences in responses from different groups.

It was then decided to ask questions based on their current attendance and feelings towards use of technology to see if those learners with poorer attendance or who felt they were not currently proficient in technological use had differing viewpoints. The survey then went on to ask questions based on the use of technology by their lecturers to see if those where their lecturers were using more technology had differing views to those where their teachers didn't use as much technology in classes.

The final set of Likert questions move on to ask the direct questions about the students feelings towards their own performance & motivational preferences when technology is used in their studies.

The survey finally concludes with looking at what technology the students currently use and what (if any) technology they think they would like to see used that would help improve their motivation and attainment within their studies.

### 3.2 **Research Questions**

The primary research question to be answered was;

- ✚ How can technology be used to motivate learners in higher education?

In order to explore this question, secondary questions were asked including;

- ✚ In which areas of a learner's education can technology be used?
- ✚ At what points during a learner's education can and should technology be used?
- ✚ What are the feelings of current students and teachers to the use of technology to support learning?
- ✚ What issues are there around the use and accessibility of technology during a learner's education?

It was also expected that as this research project progressed these questions were likely to change and/or be added to.

### **3.3 Ethical Consideration**

Primary research was undertaken on a voluntary participation basis, and all names and personal information has been removed before publishing any research findings. However identifiers pertaining to socio-economic groupings have remained where relevant.

All care and attention has been considered at all times so as to not bring into disrepute any establishment or persons. Any conflicts of interest have been avoided and nullified.

### **3.4 Demographics**

There were 209 students surveyed in total, of these 209 completed surveys, 205 were completed fully and correctly with 4 of these surveys being only part completed or spoiled.

There were a total of 132 male and 77 female respondents, across seven different subject areas. Banking and Accountancy from the initial survey were merged and there were unfortunately no respondents from the Travel and Tourism faculty.

These surveys were conducted with mostly Foundation and First Year Degree level students across numerous fields of study, using the survey that can be seen in Appendix A.

Tables 3.1 to 3.5 show the breakdowns of the sample group based on their age, gender, subject area, level of study, socio-economic grouping and living arrangements.

This initial table (Table 3.1) shows the entire sample group separated out by subject, gender and age profile.

		Age Profile			
		< 20	20-24	25-34	35+
Banking & Accountancy	Male	9	5	0	0
	Female	4	0	0	0
Health & Social Care	Male	0	0	0	0
	Female	9	4	0	0
Information Technology	Male	11	7	0	0
	Female	1	0	0	0
Legal	Male	5	3	0	3
	Female	17	6	0	1
Management	Male	4	7	0	0
	Female	0	1	2	0
Sales & Marketing	Male	6	11	1	0
	Female	4	4	1	0
Science & Engineering	Male	33	25	1	1
	Female	17	5	1	0
Totals		120	78	6	5

Table 3.1: Sample by Subject, Gender & Age

This table (Table 3.2) shows the age profile of the sample group by subject area. Sliding colour scales (also used later in this report) show the dominant age groups, with dark green colours being the largest amounts, and dark reds being the least.

		Age Profile			
		< 20	20-24	25-34	35+
Banking & Accountancy	Total	13	5	0	0
	%	72%	28%	0%	0%
Health & Social Care	Total	9	4	0	0
	%	69%	31%	0%	0%
Information Technology	Total	12	7	0	0
	%	63%	37%	0%	0%
Legal	Total	22	9	0	4
	%	63%	26%	0%	11%
Management	Total	4	8	2	0
	%	29%	57%	14%	0%
Sales & Marketing	Total	10	15	2	0
	%	37%	56%	7%	0%
Science & Engineering	Total	50	30	2	1
	%	60%	36%	2%	1%

Table 3.2: Age Profile by Subject

This table (Table 3.3) shows the entire sample group separated out by subject, gender and then socio-economic grouping (referred to as class).

		<b>Socio-Economic Grouping (Class)</b>			
		<b>Lower</b>	<b>Working</b>	<b>Middle</b>	<b>Upper</b>
Banking & Accountancy	Male	2	9	3	0
	Female	0	2	2	0
Health & Social Care	Male	0	0	0	0
	Female	0	5	8	0
Information Technology	Male	0	7	11	0
	Female	0	0	1	0
Legal	Male	1	7	2	1
	Female	1	22	1	0
Management	Male	0	6	5	0
	Female	0	1	2	0
Sales & Marketing	Male	1	8	8	1
	Female	0	4	5	0
Science & Engineering	Male	6	20	33	1
	Female	1	15	7	0
<b>Totals</b>		<b>12</b>	<b>106</b>	<b>88</b>	<b>3</b>

Table 3.3: Sample by Subject, Gender & Socio-Economic Group (Class)

This table (Table 3.4) shows the entire sample group separated out by subject, gender and level of study.

		<b>Level of study</b>	
		<b>Foundation Year</b>	<b>Degree</b>
Banking & Accountancy	Male	14	0
	Female	4	0
Health & Social Care	Male	0	0
	Female	13	0
Information Technology	Male	11	7
	Female	0	1
Legal	Male	8	3
	Female	18	6
Management	Male	3	8
	Female	2	1
Sales & Marketing	Male	7	11
	Female	4	5
Science & Engineering	Male	60	0
	Female	23	0
<b>Totals</b>		<b>167</b>	<b>42</b>

Table 3.4: Sample by Subject, Gender & Level of Study

This table (Table 3.5) shows the entire sample group separated out by subject, gender and living arrangements.

		Living Arrangements	
		Living with Parents	Not Living with Parents
Banking & Accountancy	Male	10	4
	Female	2	2
Health & Social Care	Male	0	0
	Female	7	6
Information Technology	Male	15	3
	Female	1	0
Legal	Male	6	5
	Female	17	7
Management	Male	6	5
	Female	0	3
Sales & Marketing	Male	4	14
	Female	4	5
Science & Engineering	Male	28	32
	Female	14	9
<b>Totals</b>		<b>114</b>	<b>95</b>

Table 3.5: Sample by Subject, Gender & Living Arrangements



## 4 Data Presentation and Analysis

*This chapter will look at the results obtained and collated from the 209 surveys conducted in a small Higher Education University College during one week of the spring term, 2013.*

### 4.1 Ownership of Technology

**Question: Which do you own?**

The following bar chart (Figure 4.5) shows the ownership of specific technology hardware, specifically computing equipment by the sample group.

It can be seen that 89% of the sample group own a laptop computer and 80% own a smartphone. However, only 34% of the sample group own a desktop computer, with an even lower 25% owning a tablet computer.

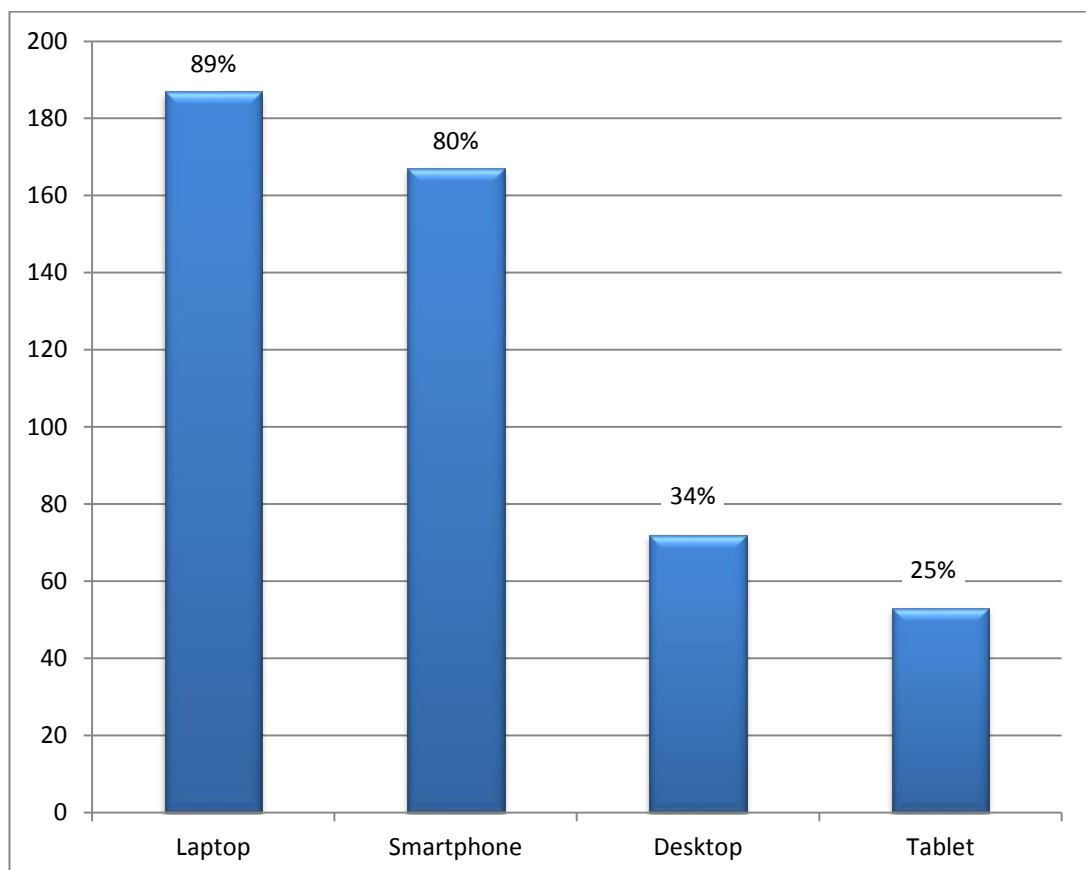


Figure 4.1: Technology Owned

The following bar chart, (Figure 4.2) shows the technology ownership of all four of these items by amount, and then broken down by the socio-economic group of the learner. This information was taken from Table 4.1 below, which shows these specific amounts.

	Desktop		Laptop		Smartphone		Tablet	
	Yes	No	Yes	No	Yes	No	Yes	No
<b>Lower Class</b>	2	10	9	3	8	4	3	9
<b>Working Class</b>	46	73	107	12	97	22	28	91
<b>Middle Class</b>	23	52	68	7	59	16	21	54
<b>Upper Class</b>	1	2	3	0	3	0	1	2

Table 4.1: Ownership of Hardware, by Socio-Economic Group (Class)

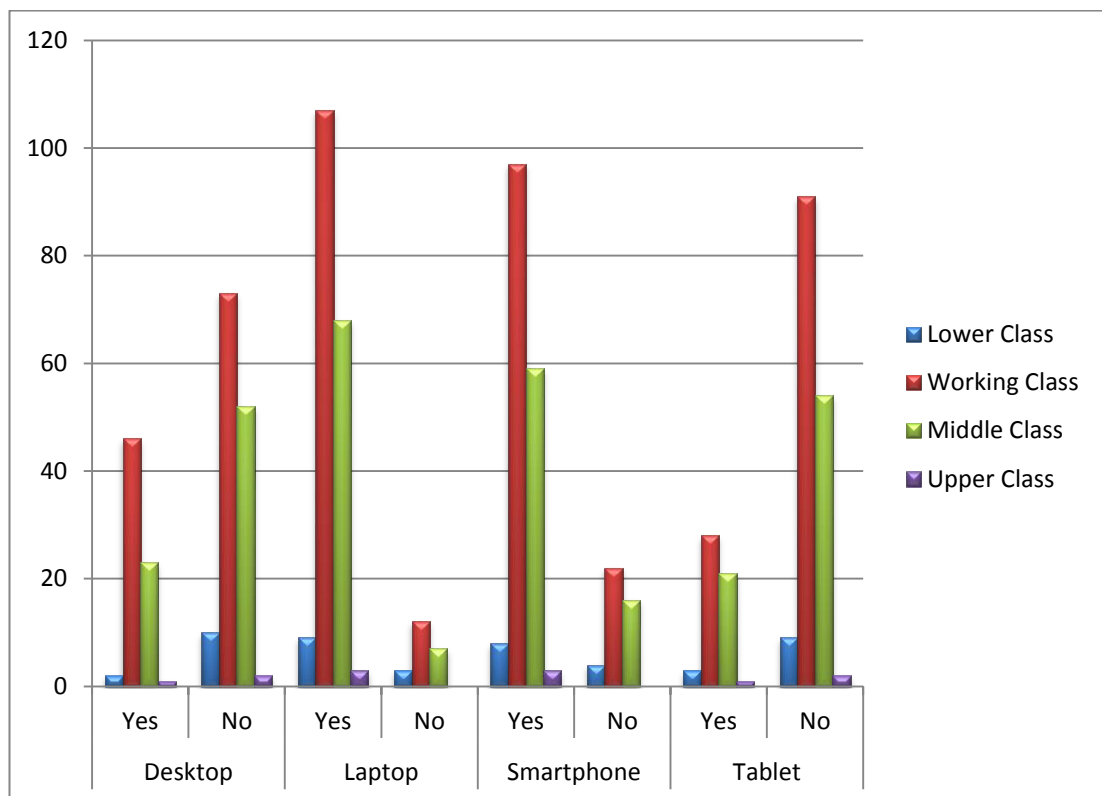


Figure 4.2: Technology Owned by Socio-Economic Grouping (Class)

The four different hardware types are shown in magnified form in the following bar charts (Figures 4.3 to 4.6). It can be seen from these bar charts that there is very little significance in a person's socio-economic grouping (or class) as to their ownership of computer hardware.



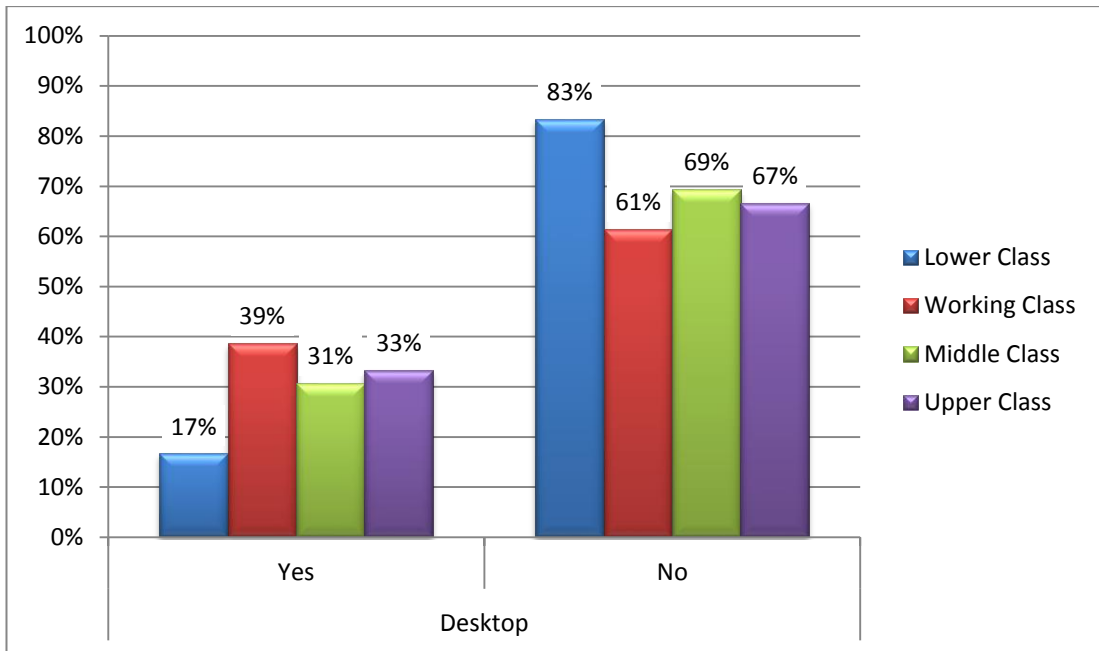


Figure 4.3: Ownership of Desktop Computers, by Class

Figure 4.3 shows that all differing socio-economic groups are more likely to not own a desktop computer, whereas Figure 4.4 shows that these same socio-economic groups are more likely to own a laptop computer. At the same time it can be seen that the lower socio-economic group, identifying themselves as 'lower class' are the most likely to not own either of these items of technology.

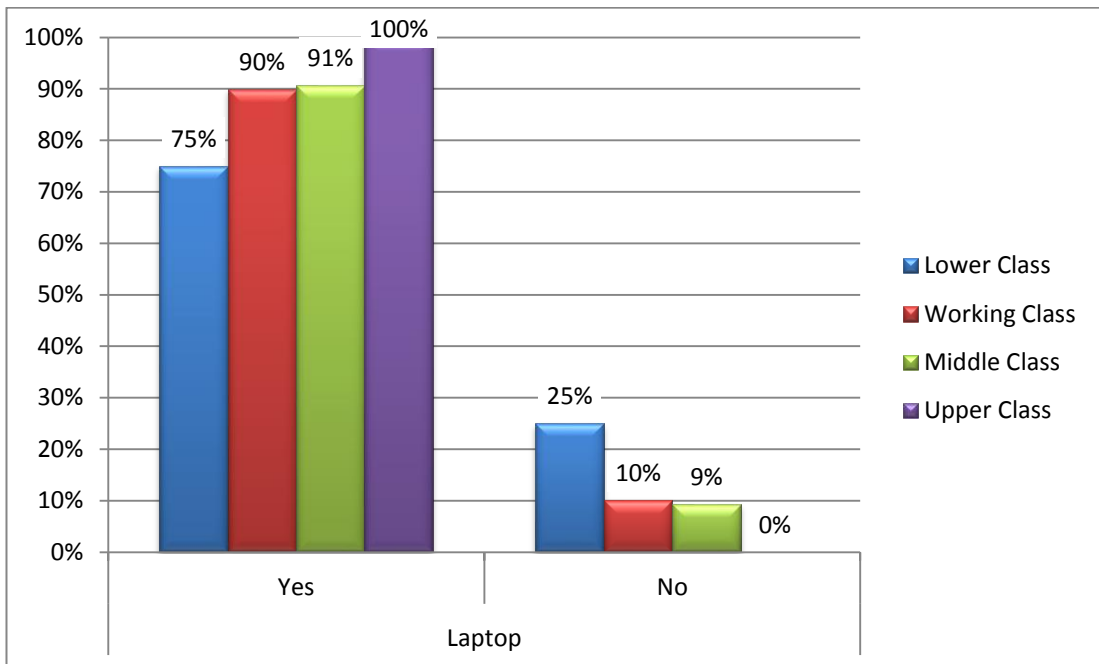


Figure 4.4: Ownership of Laptop Computers, by Class

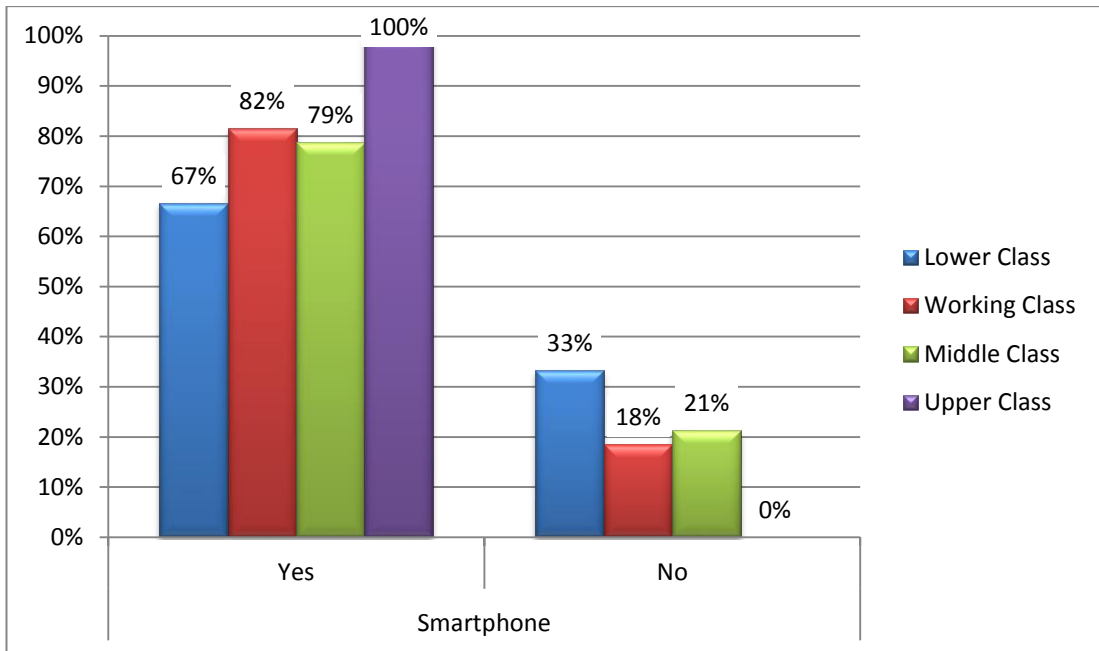


Figure 4.5: Ownership of Smartphones, by Class

Interestingly, when comparing socio-economic groupings and ownership of technology, Figure 4.5 shows that all groups are highly likely to now own smartphone technology and, whilst the numbers are still low, there are more people than expected moving into ownership of tablet computers, as shown in Figure 4.6.

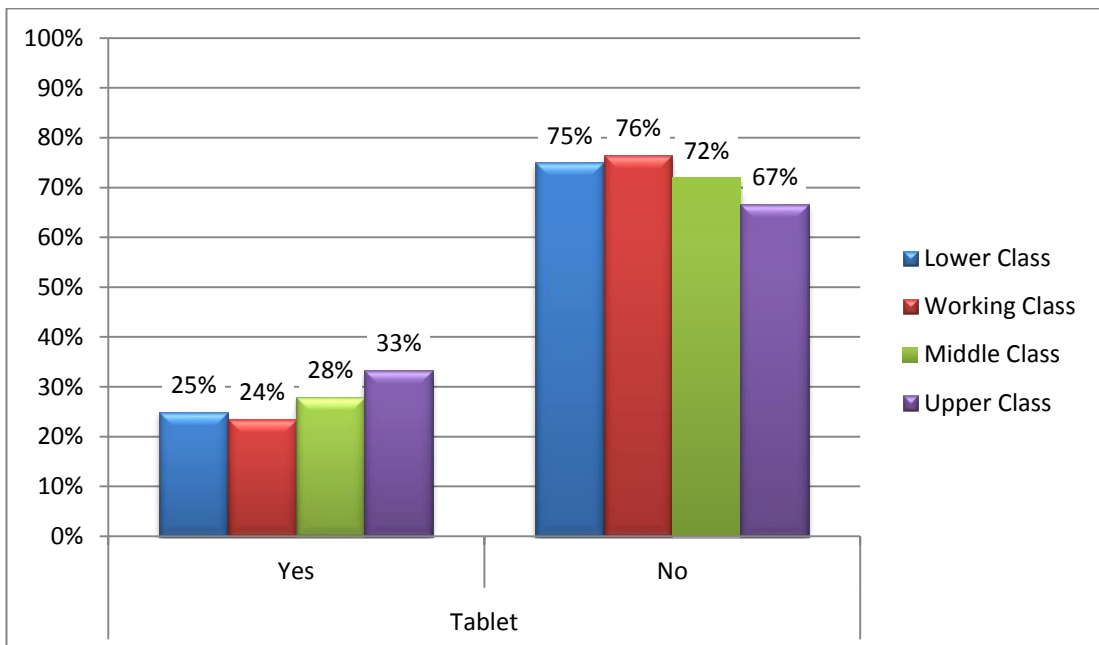


Figure 4.6: Ownership of Tablet Computers, by Class

The following bar chart, (Figure 4.7) shows the technology ownership of all four of these technological items by amount, and then broken down by the age group of the learner. This information was taken from Table 4.2 below, which shows these specific amounts.

	Desktop		Laptop		Smartphone		Tablet	
	Yes	No	Yes	No	Yes	No	Yes	No
<b>Under 20</b>	48	72	108	12	98	22	35	85
<b>20-24</b>	22	55	68	9	60	17	16	61
<b>25-34</b>	2	5	6	1	7	0	1	6
<b>Over 35</b>	0	5	5	0	2	3	1	4

Table 4.2: Ownership of Hardware by Age

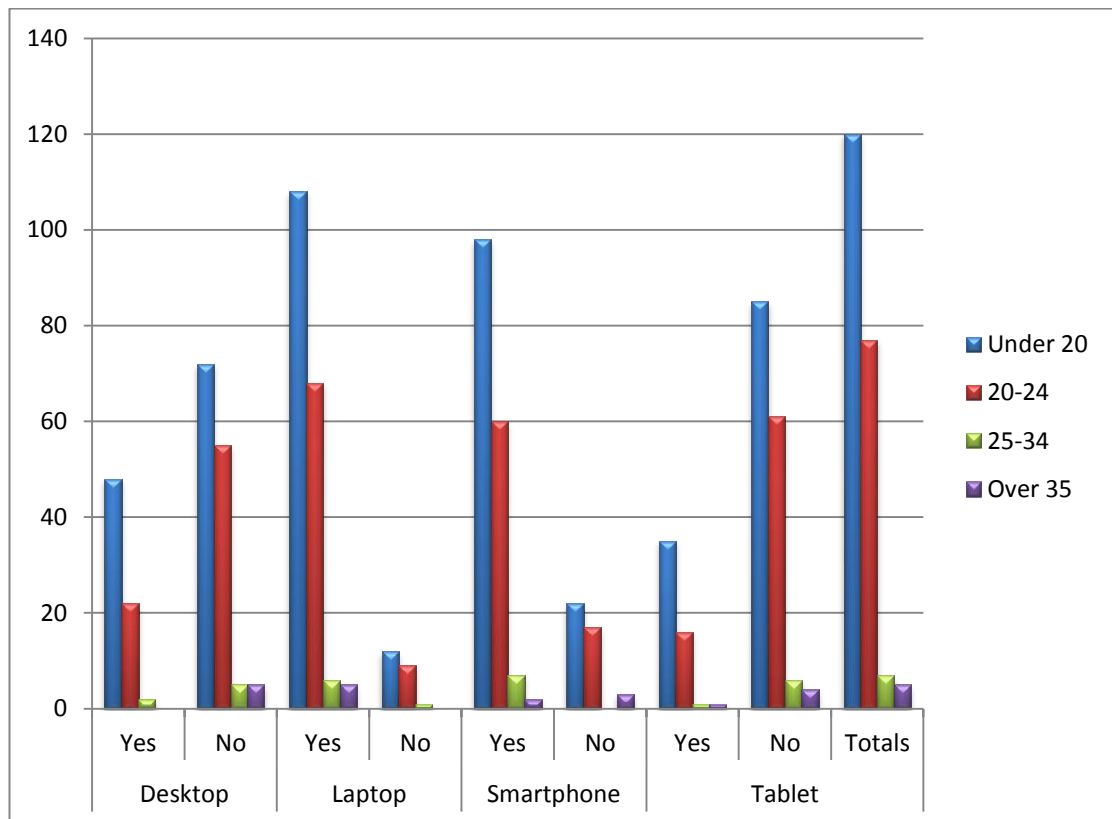


Figure 4.7: Technology Owned by Age

The four different hardware types are shown in magnified form in the following bar charts (Figures 4.8 to 4.11). It can be seen from these bar charts that there is very little significance in a person's age as to their ownership of computer hardware. However, it is worth noting that Smartphone ownership (see Figure 4.10) for the over 35s is considerably different than other younger age groups, with it being the only area where the balance of ownership or non-ownership does change. Whereas with all other

age groups more people own smartphones than do not own smartphones, in the case of the over 35s it can be seen that more of them do not own smartphones than do.

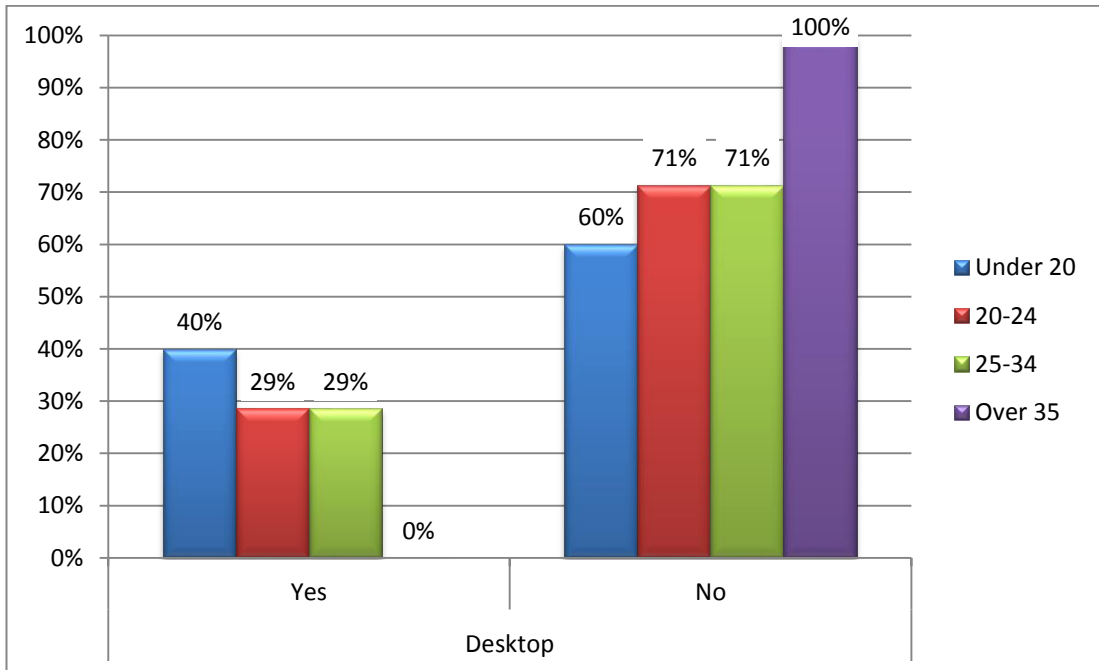


Figure 4.8: Ownership of Desktop Computers, by Age

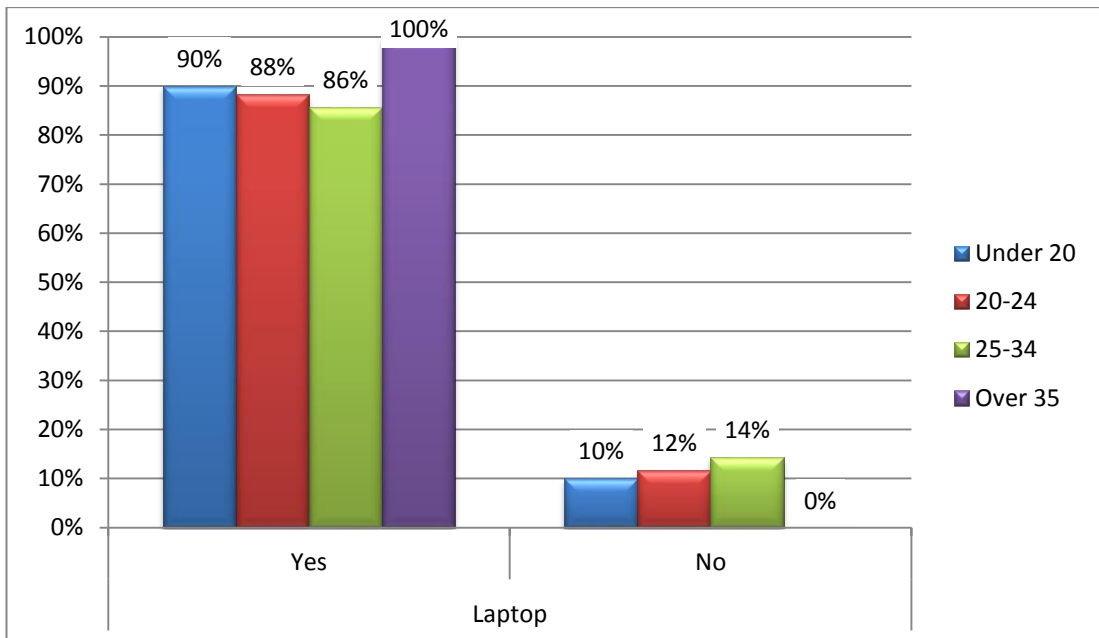


Figure 4.9: Ownership of Laptop Computers, by Age

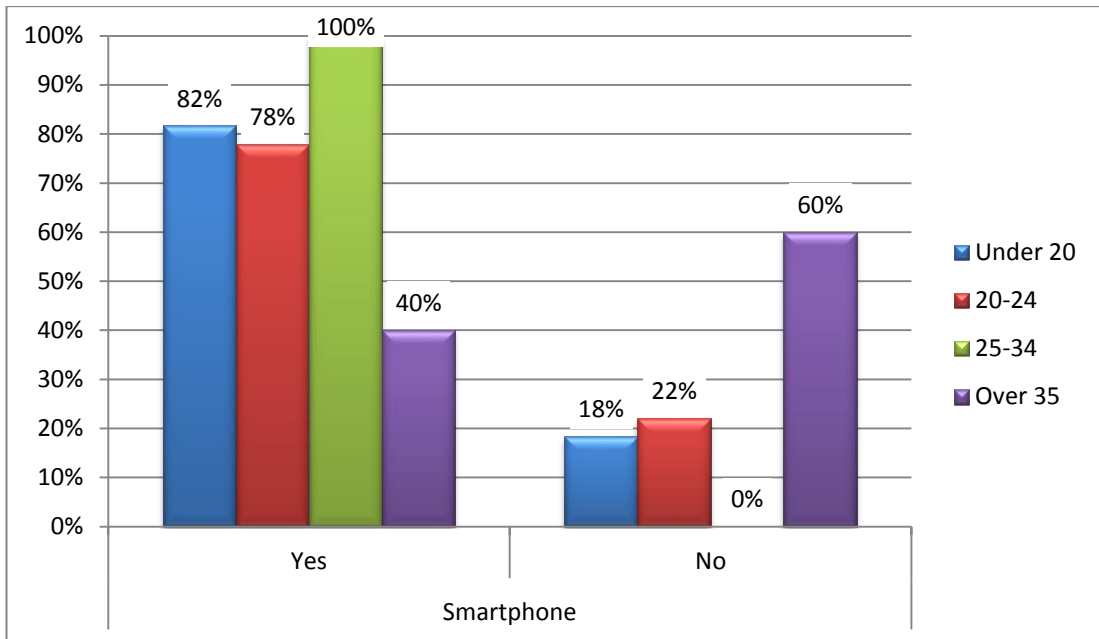


Figure 4.10: Ownership of Smartphones, by Age

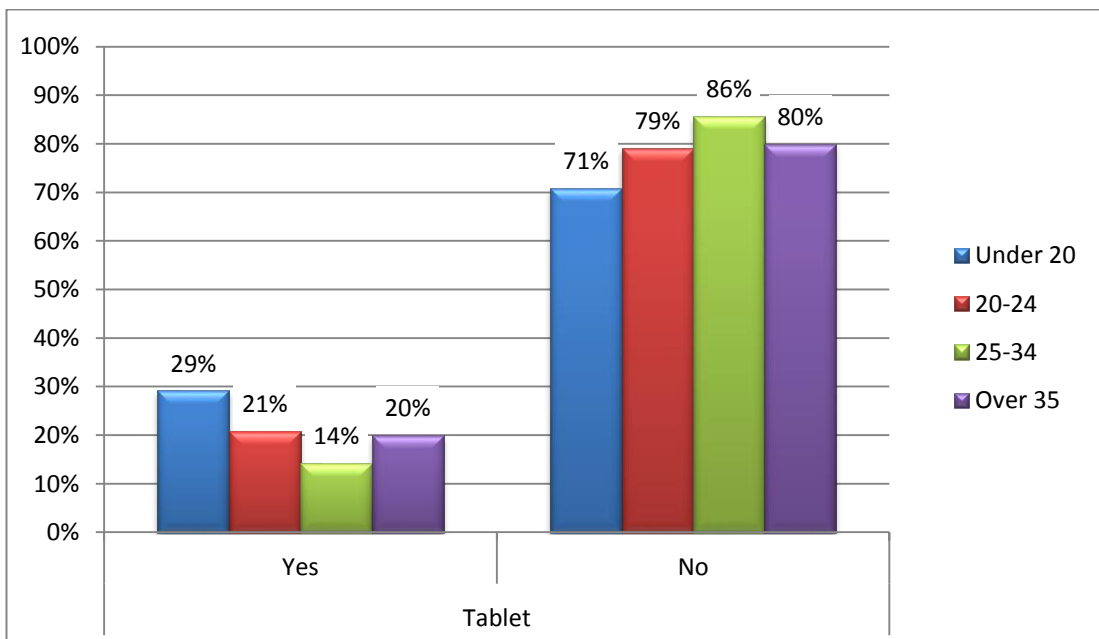


Figure 4.11: Ownership of Tablet Computers, by Age

## 4.2 Access to the Internet

### ***Question: Where do you access the Internet?***

The following bar chart (Figure 4.12) shows where the learners access the Internet. With no respondents saying they had no access to the Internet (which was expected due to University being an option) it can be seen that a very large 95% of respondents use Internet access at home for their studies. Perhaps surprisingly, 83% of respondents now use mobile Internet on a phone to access the Internet for study-based use.

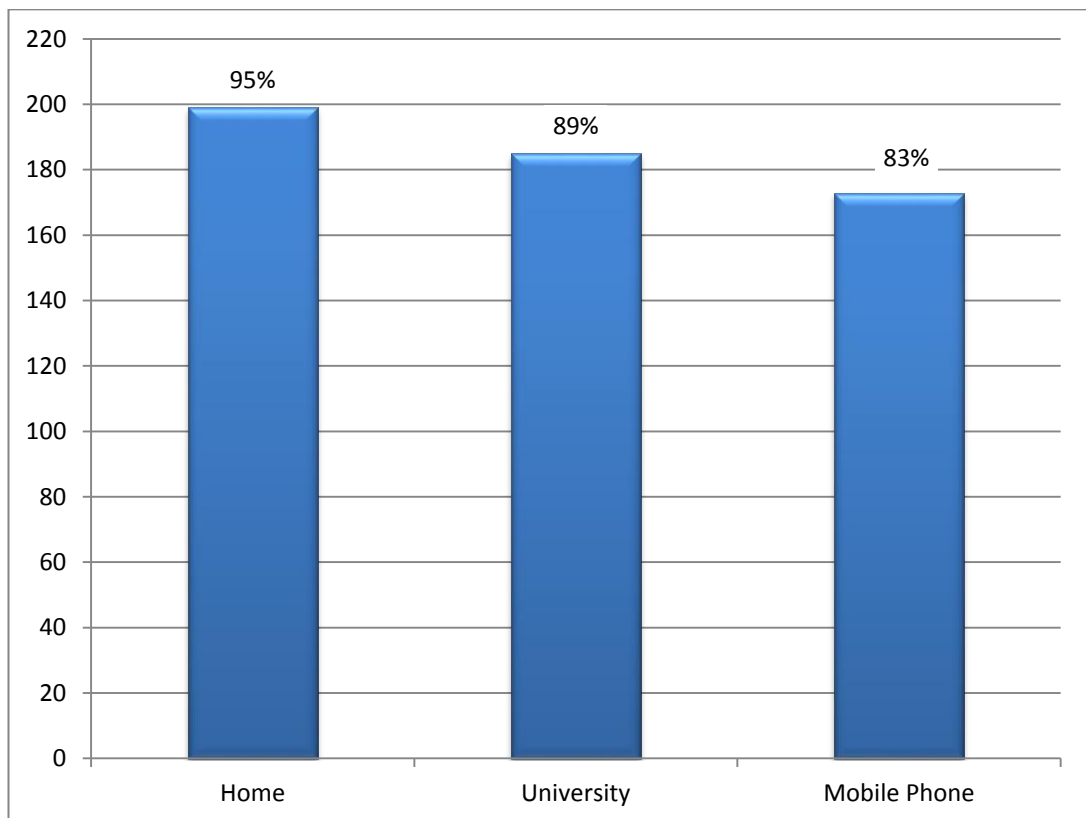


Figure 4.12: Access to the Internet

### 4.3 Usage of Technology

**Question: What types of technology, if any, do you use for your studies?**

The following bar charts show the different technologies used for studies by the sample group. In Figure 4.13 we can see the combined responses for all of the offered options offered.

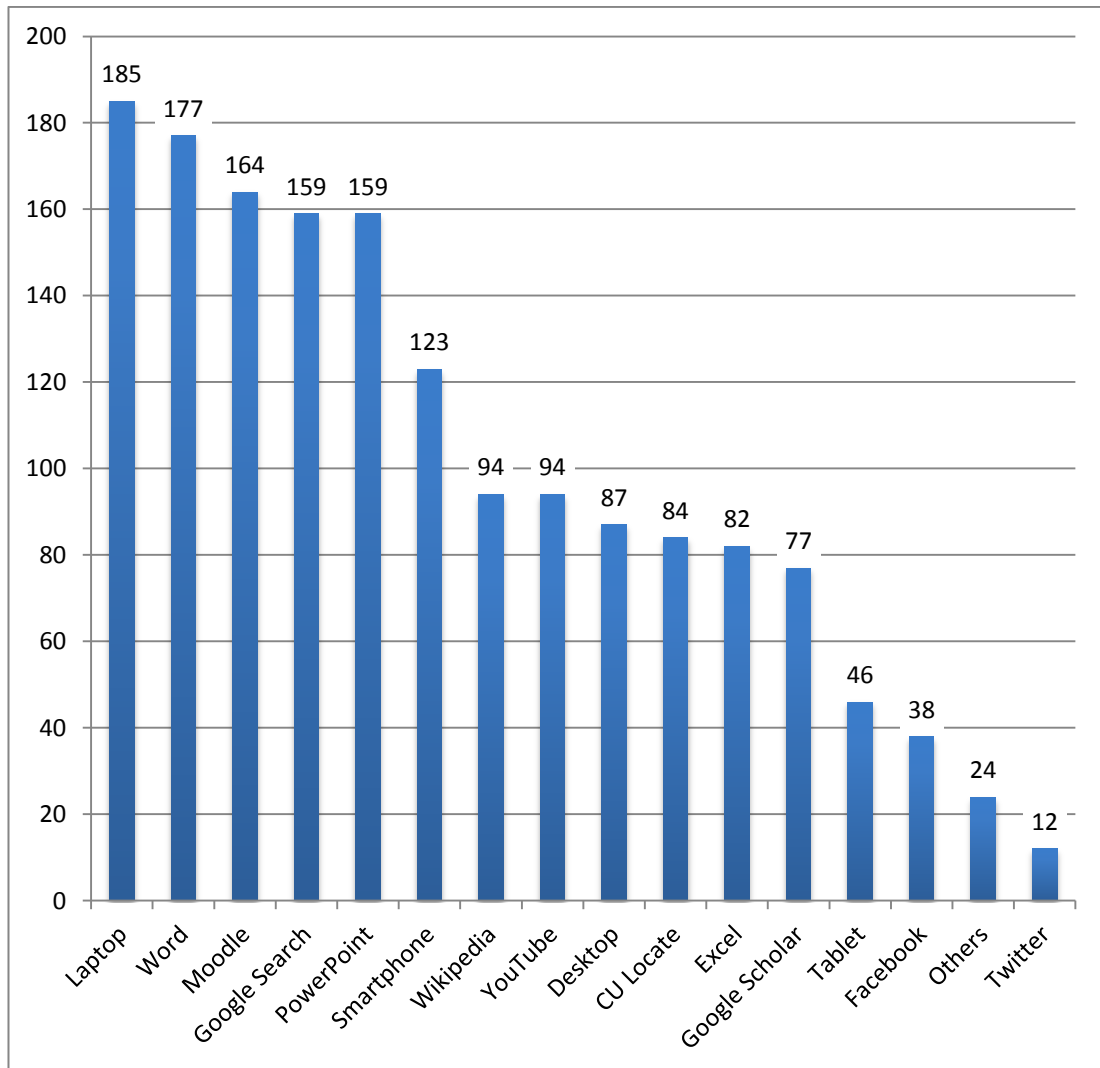


Figure 4.13: Technology Used in Studies (Combined)

Table 4.3 shows the raw data from the surveys on this question. It can be seen that the most popular technologies are laptop computers, standard (off the shelf) software, a VLE and Internet sites. This is shown in the fact that 90% of respondents own and use a laptop computer, with 86% using Microsoft Word. 80% of the respondents use Moodle regularly to help with their studies and 78% Google’s search engine.

At the bottom of this list, the least popular technologies being used to aid students in their studies are Facebook and Twitter; *an area where a lot of research work is currently being undertaken in the educational realm in order to utilise the power of social media in education.*

Laptop	Desktop	Smartphone	Tablet
185	87	123	46
90%	42%	60%	22%
CU Locate	Moodle	Google Scholar	Wikipedia
84	164	77	94
41%	80%	38%	46%
Facebook	Twitter	Google Search	YouTube
38	12	159	94
19%	6%	78%	46%
Word	Excel	PowerPoint	Others
177	82	159	24
86%	40%	78%	12%

Table 4.3: Types of Technology Used (Raw Data)

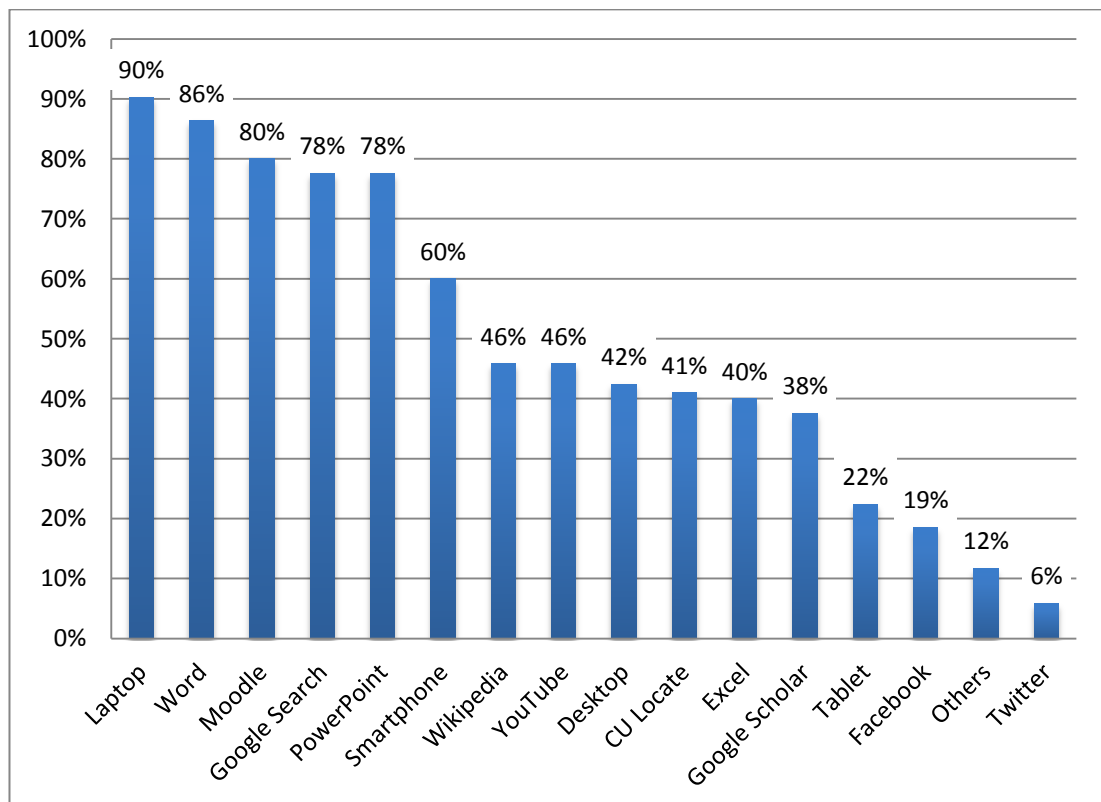


Figure 4.14: Technology Used in Studies (% Format)

Figure 4.14 shows the same data on technology used for students' studies, in a percentage format.



These items are broken down further and so can be seen in a more magnified form in the following bar charts (Figures 4.14 to 4.16). They group these items into Hardware, Software and Web services products that can be used to aid studies.

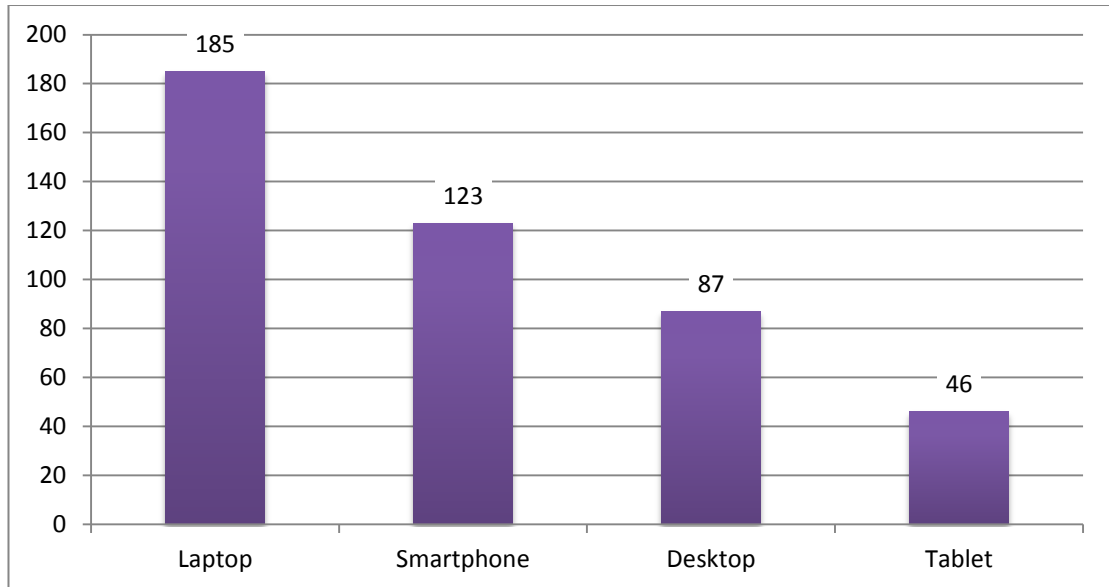


Figure 4.15: Hardware Used in Studies

It can clearly be seen again, in Figure 4.15 that laptop computers are the predominant items of hardware used by students in their studies, with a relatively low number using traditional desktop computers. It can also be seen that nearly as many students use smartphones than both desktop or tablet computers combined.

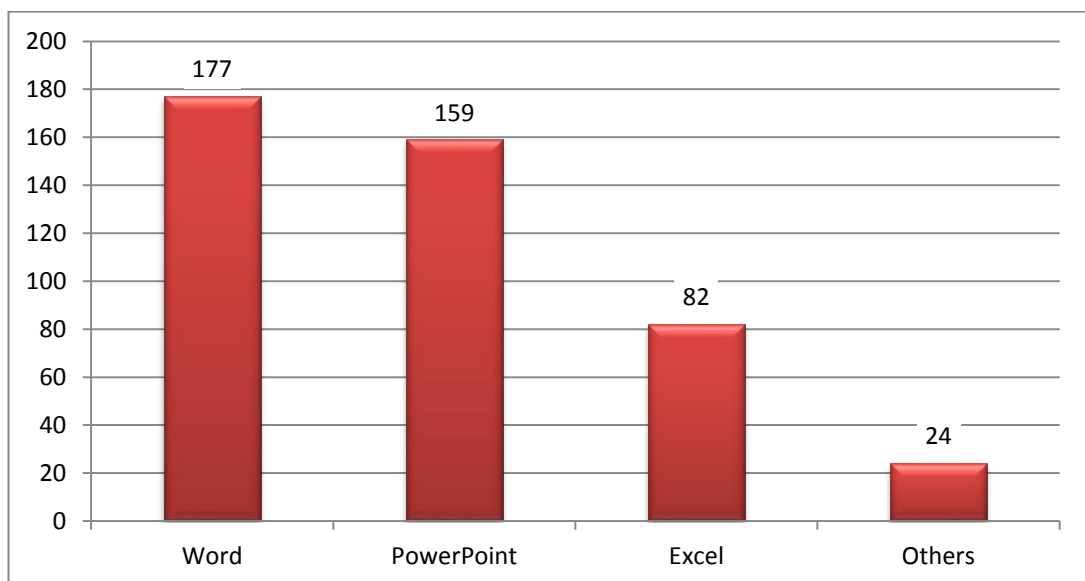


Figure 4.16: Software Used in Studies

It is evident from the bar chart relating use of web based resources within the students' studies (Figure 4.17) that the most popular of these are Moodle and Google's Search Engine; Google being the most popular of the wealth of search engines in use at the time of this research (eBizMBA, 2013) and Moodle being the University's default VLE make this unsurprising. However there is very little use of social networking, such as Facebook and Twitter, and, more surprisingly both Google's Academic Search Engine (Google Scholar) and the University's own library resources location tool (CU Locate) also score low in the list of web based resources used by students in their studies. Perhaps even more enlightening is the fact that Wikipedia, a collaborative encyclopaedia website that anyone with internet access can write and edit, scores higher than both of these latter resources, with 94 students (46%) compared to 77 students (38% - Google Scholar) and 84 students (41% - CU Locate) respectively.

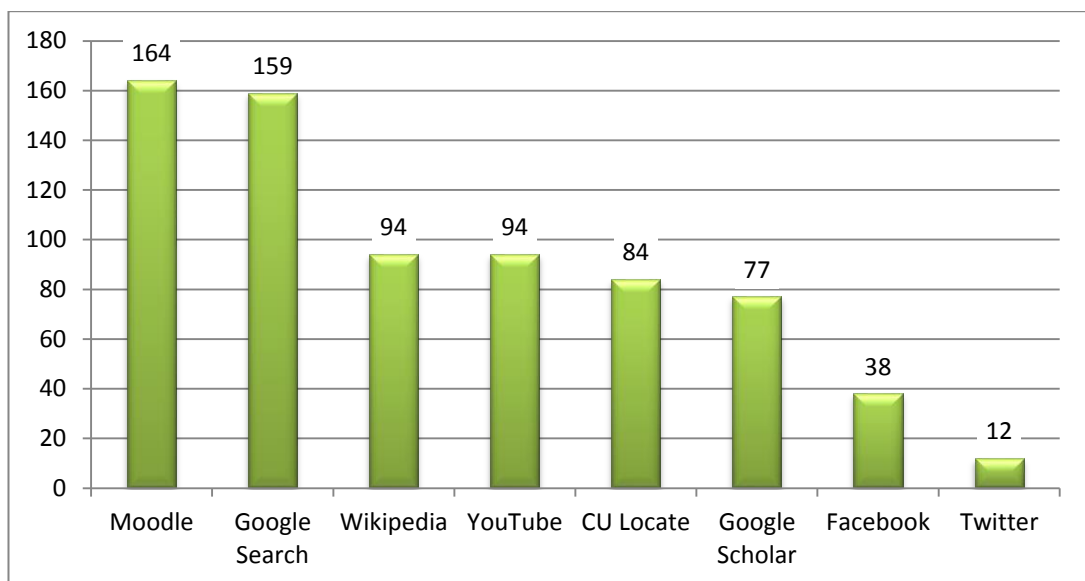


Figure 4.17: Web Based Media Used in Studies

#### 4.4 Class Attendance

**Statement: I regularly attend all classes**

The following pie chart (Figure 4.17 from Table 4.4) shows the attendance for all students surveyed. It can be seen that nearly three quarters of those surveyed believe themselves to regularly attend all classes, with less than 10% of those surveyed thinking they do not regularly attend all classes.

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
60	91	38	17	3
29%	44%	18%	8%	1%

Table 4.4: On Attendance in Class

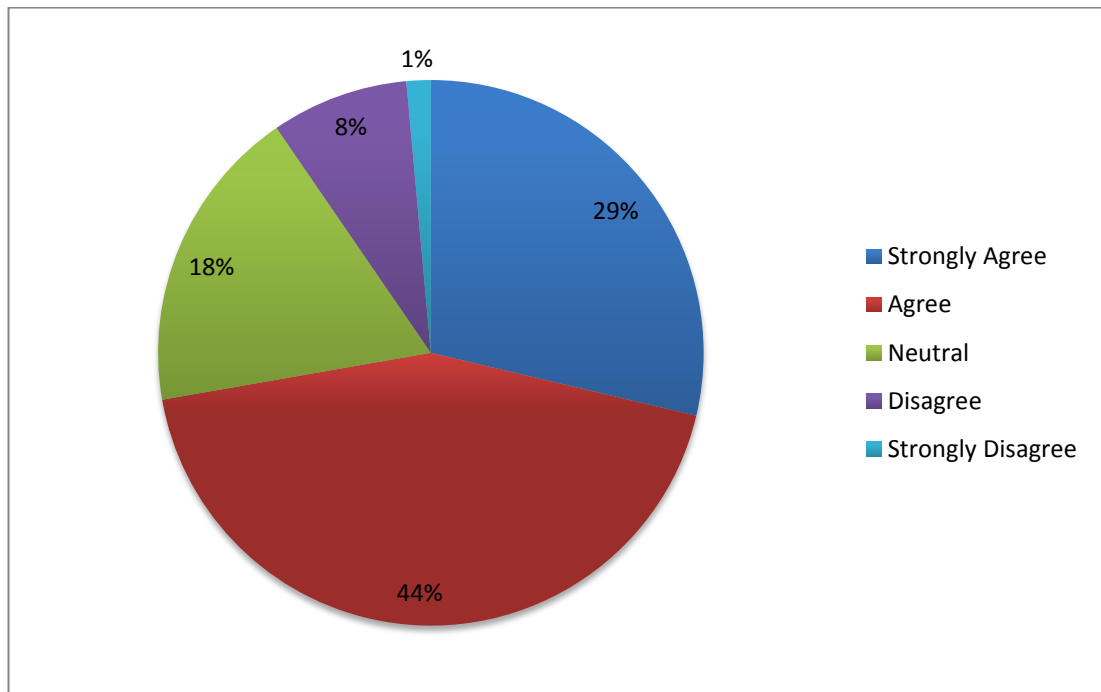


Figure 4.18: Attendance in Class

## 4.5 Technological ability

### **Statement: I am good at using technology**

Figure 4.19 (taken from Table 4.5) shows that over 90% of those surveyed consider themselves 'good at using technology'. The fact that the majority of those surveyed are under the age of 35 and 198 of the 209 surveyed were under the age of 25 is very telling in this. The vast majority of those learners surveyed in the sample group would be in the 'net-native' category and so have grown up not only with technology but with the Internet as part of their lives; as discussed in Chapter 2.4.

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
84	106	19	0	0
40%	51%	9%	0%	0%

Table 4.5: On Technological Ability

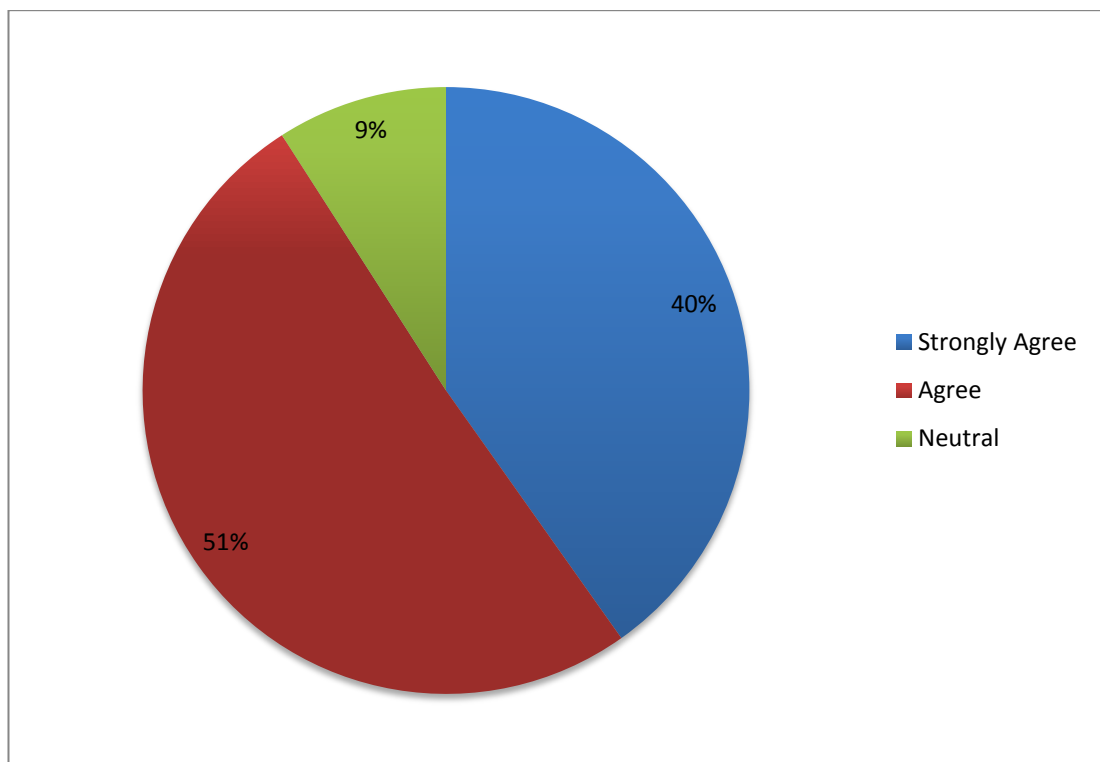


Figure 4.19: Technological Ability

#### 4.6 Enjoyment of Technology

**Statement: I enjoy using technology**

It can be seen in Figure 4.20 (taken from Table 4.6) that 93% of respondents enjoy using technology be that in their studies or general life. Only one of the respondents either disagreed or strongly disagreed with this statement.

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
107	87	14	1	0
51%	42%	7%	0%	0%

Table 4.6: On Enjoyment of Using Technologies

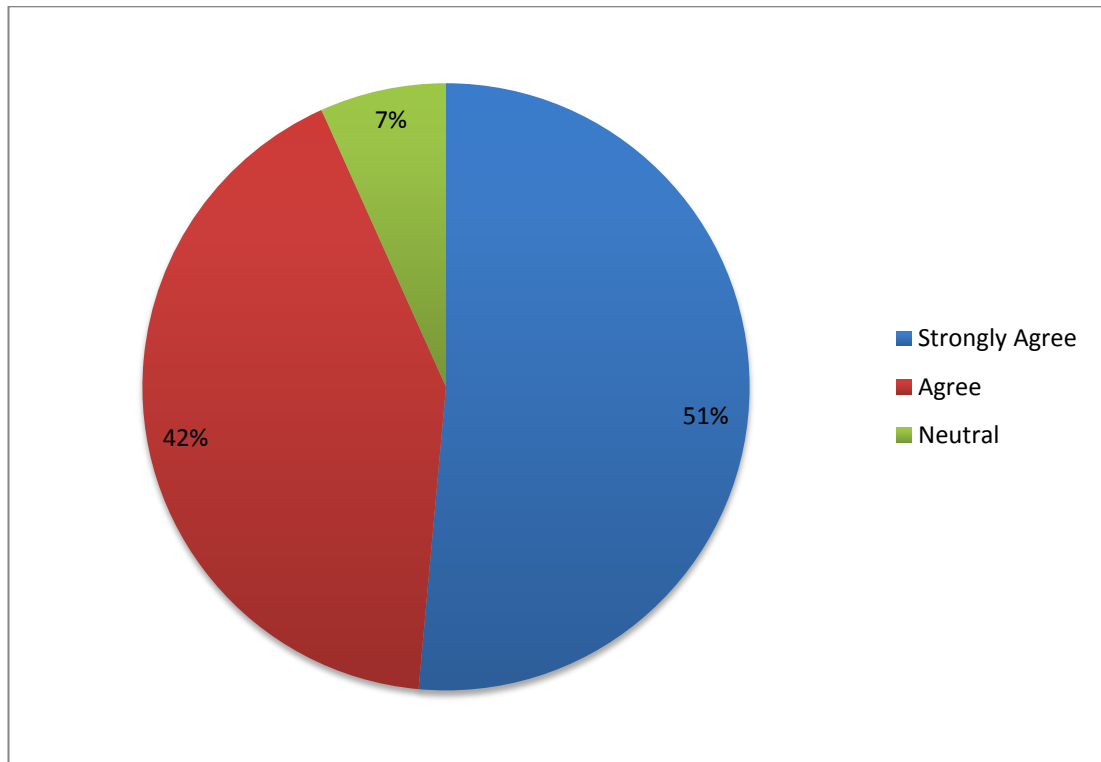


Figure 4.20: Technological Enjoyment

#### 4.7 Teachers' use of Technology

**Statement: My teachers use technology in lessons**

Figure 4.21 (taken from Table 4.7) shows that 89% of the respondents agreed that their teachers use technology regularly in lessons, with - again - only one respondent disagreeing with this statement.

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
74	113	21	1	0
35%	54%	10%	0%	0%

Table 4.7: On Teachers' Use of Technology

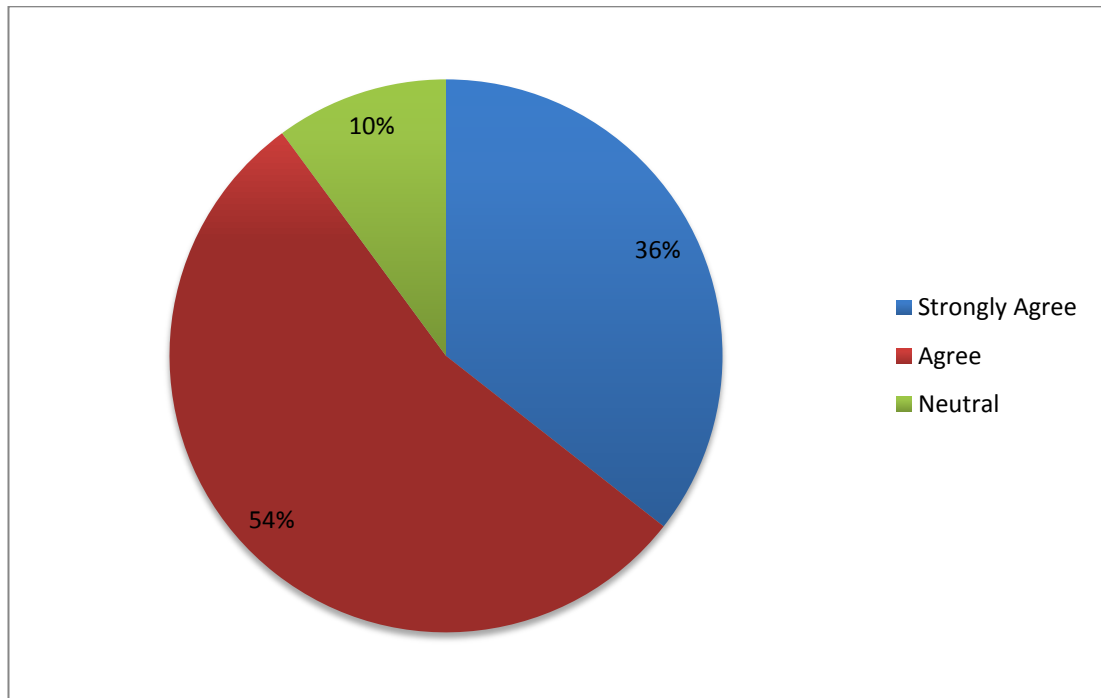


Figure 4.21: Teachers' Use of Technology

## 4.8 Teachers' use of Moodle

**Statement: My teachers use Moodle and keep it up to date**

It can be seen in Figure 4.22 (taken from Table 4.8) that 89% of the respondents agreed with the statement that their teachers use Moodle, the University's default virtual learning environment (VLE). Three of the respondents disagreed with this statement.

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
80	106	20	2	1
38%	51%	10%	1%	0%

Table 4.8: On Teachers' Use of Moodle (VLE)

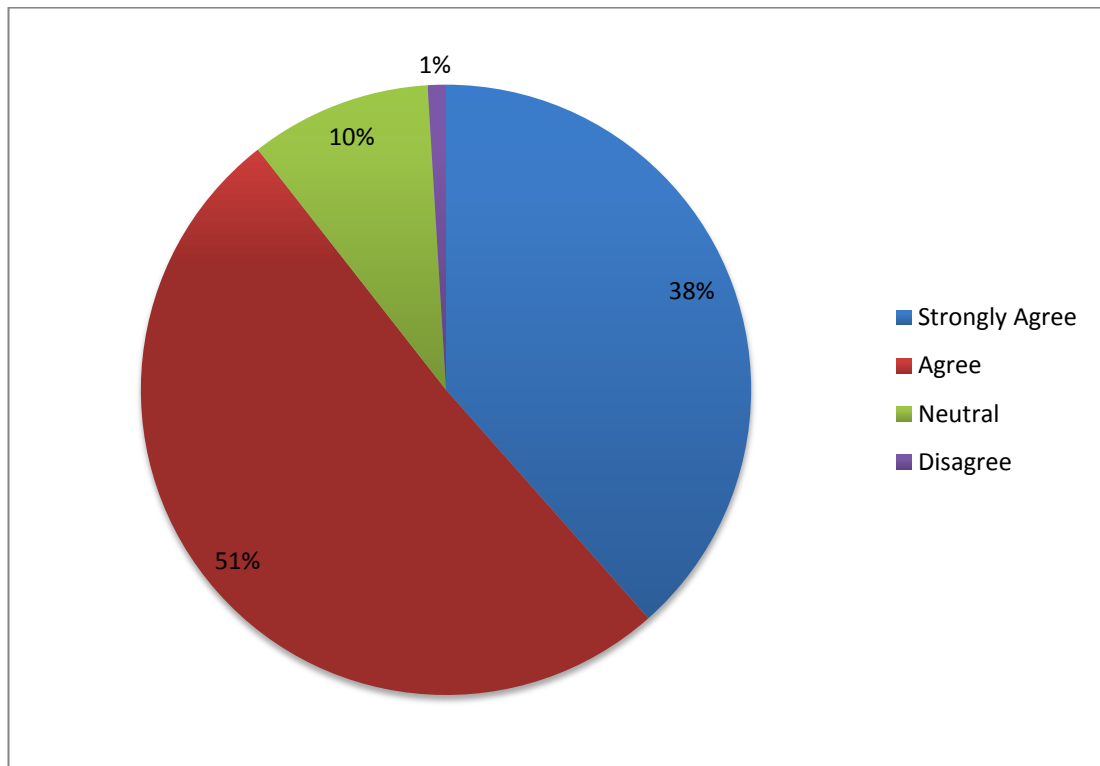


Figure 4.22: Teachers' Use of Moodle

#### 4.9 Use of Online Sources for Research

**Statement: I use online sources for my research and my studies**

As expected with predominantly 'net-native' learners, 92% of the learners sampled state that they do use online sources for their research and studies with only two respondents disagreeing with this statement, inferring they do not use online sources in their research and studies, as shown in Figure 4.23 (taken from Table 4.9).

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
105	87	15	2	0
50%	42%	7%	1%	0%

Table 4.9: On the use of Online Sources for Studying

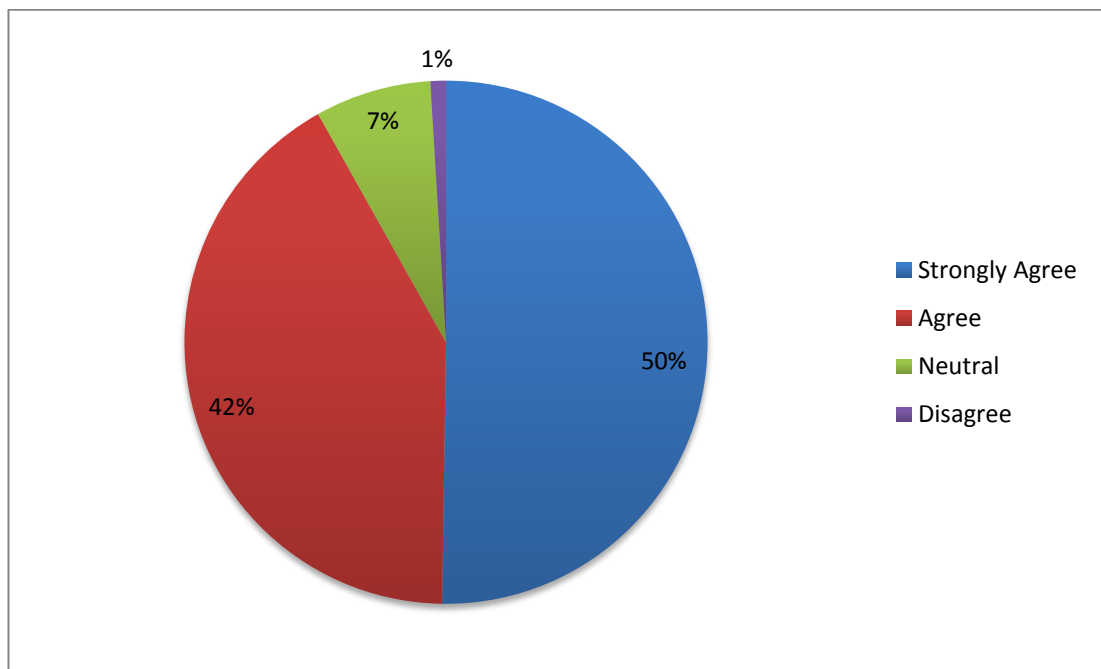


Figure 4.23: Use of Online Sources in Studies



#### 4.10 Student's use of Moodle

**Statement: I use Moodle regularly to help with my studies**

It can be seen in Figure 4.24 (taken from Table 4.10) that 73% of the respondents agreed that they use Moodle regularly to help with their studies, whilst 7% of the respondents disagreed. It can be reasonably assumed that due to the University's compulsory use of Moodle for certain aspects, such as submission of all coursework and all lectures being available for future reference on Moodle, that even those that state they do not *regularly* use Moodle, they must still make some use of it for these reasons at the bare minimum.

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
61	91	42	13	2
29%	44%	20%	6%	1%

Table 4.10: On the Student's Use of Moodle for Studying

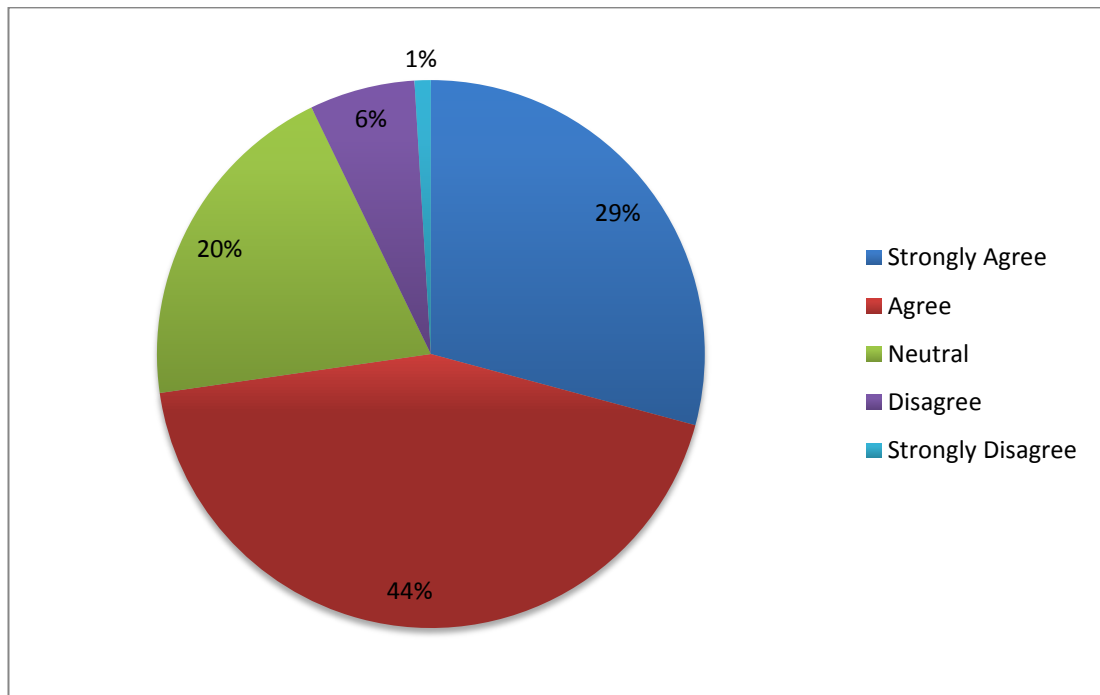


Figure 4.24: Use of Moodle in Studies

#### 4.11 Student's use of Social Networking for Study Purposes

**Statement: I use social networking media to help with my studies**

Figure 4.25 (taken from Table 4.11) shows that some 40% of respondents disagree with the statement that they use social networking media to help with their studies. Conversely only 34% of those surveyed do admit to using social networking media to help with their studies.

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
20	51	55	58	25
10%	24%	26%	28%	12%

Table 4.11: On the Use of Social Networking to Help Studying.

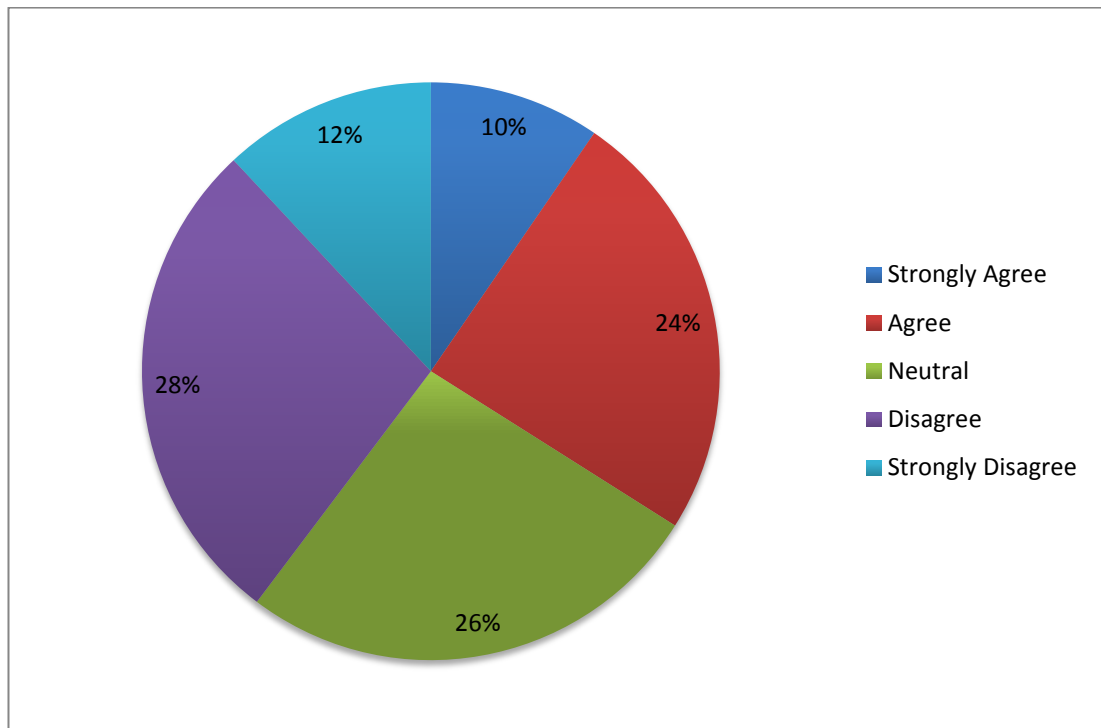


Figure 4.25: Use of Social Media in Studies

#### 4.12 Enjoyment of Study when using Technology

**Statement: I enjoy my classes more when technology is used**

Figure 4.26 (taken from Table 4.12) illustrates that 4% of those surveyed do not enjoy classes more when technology is used, and 67% of respondents state that they do enjoy classes more when technology is used. Almost a third (30%) of respondents responded neutrally to this statement.

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
56	83	62	6	2
27%	40%	30%	3%	1%

Table 4.12: On Enjoyment in Class Using Technology

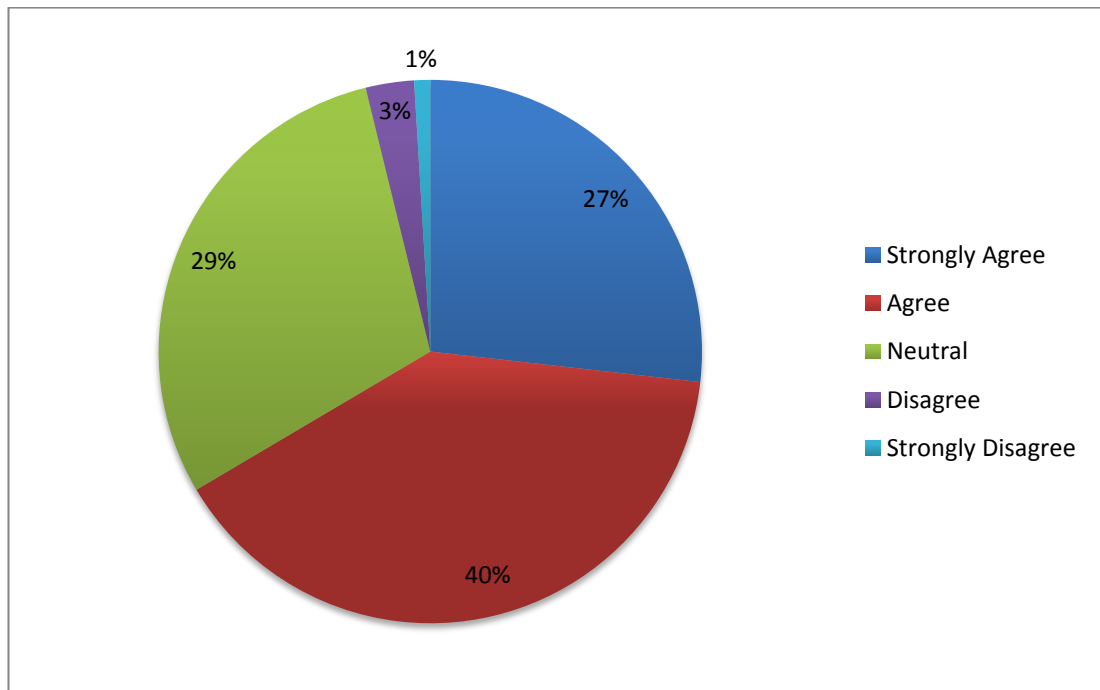


Figure 4.26: Enjoyment of Studies When Technology is Used

### 4.13 Feeling Motivated when using Technology

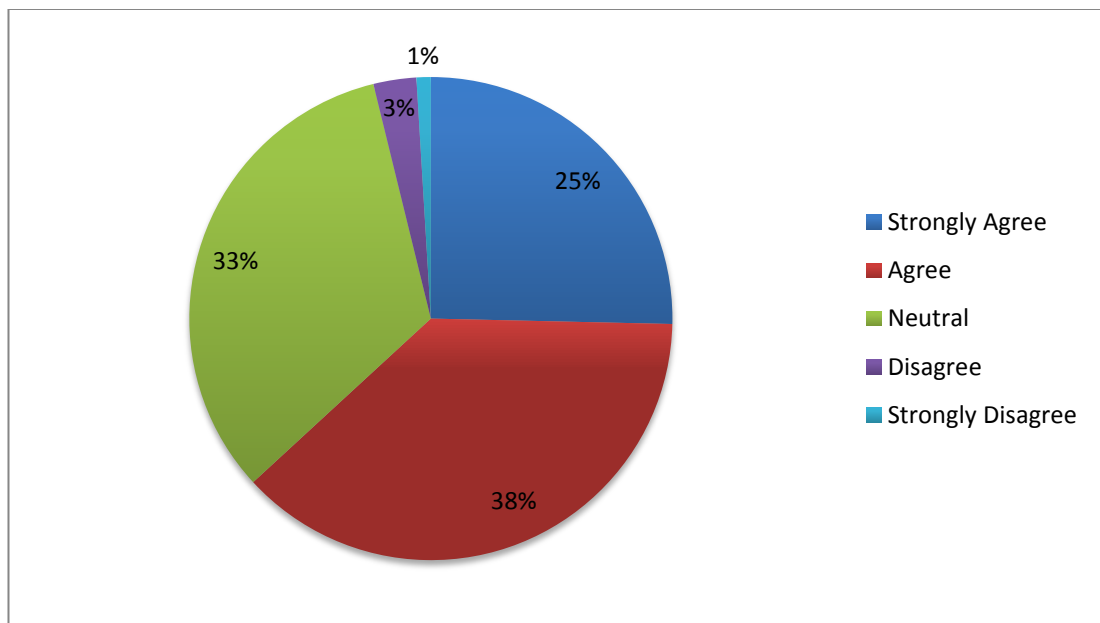
**Statement: I feel more motivated to study when using technology**

Figure 4.27 (taken from Table 4.13) shows that 63% of those surveyed agreed that they feel more motivated to study when using technology, with only 4% (eight respondents) stating that they do not feel more motivated.

*This information is broken down into more detail in further representations in this chapter with particular focus on gender and subject area of those surveyed.*

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
53	79	69	6	2
25%	38%	33%	3%	1%

**Table 4.13: On Feeling More Motivated When Using Technology**



**Figure 4.27: Motivational Views of Technology**

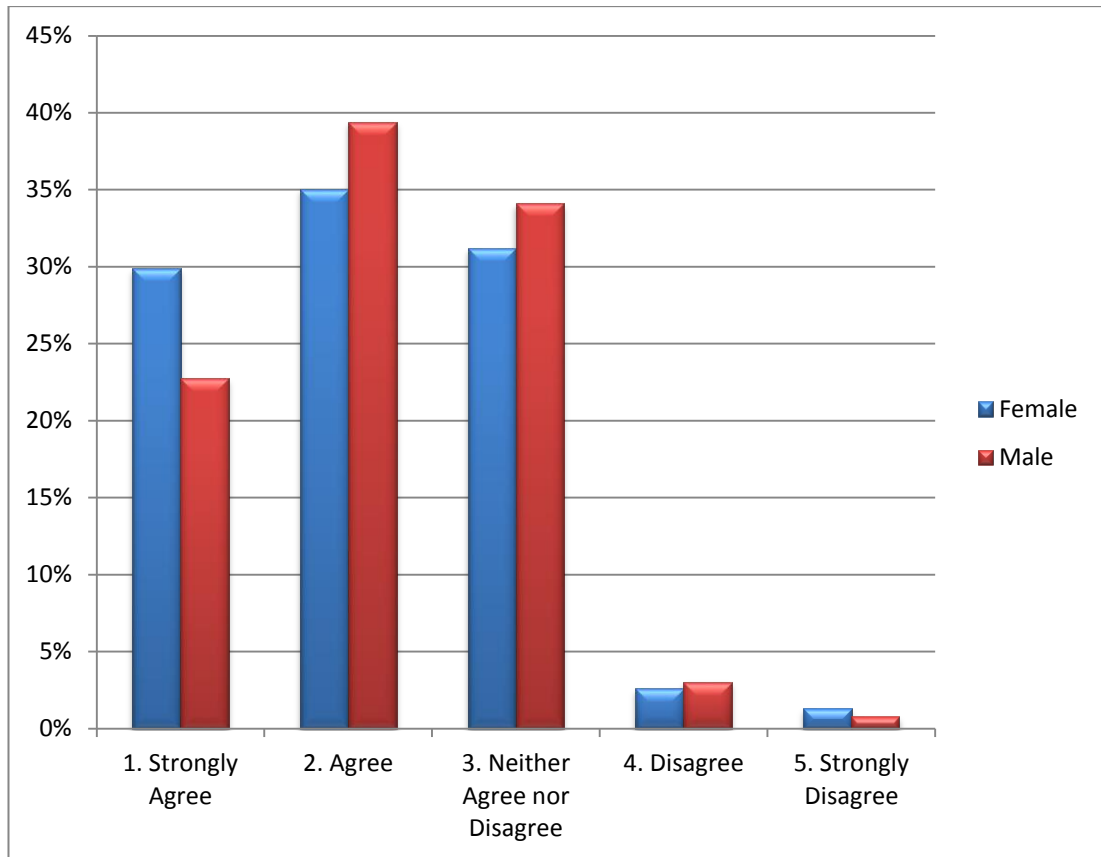


Figure 4.28: Motivational Views of Technology by Gender

Figure 4.28 shows the percentages of each gender and their views on how motivational they find the use of technology in their studies. It can be seen that whilst there is a larger proportion of females with a strong positive opinion on the motivational benefits of technology in the first instance this is evened out when added to the agree and neutral feelings towards the use of technology to motivate learners.

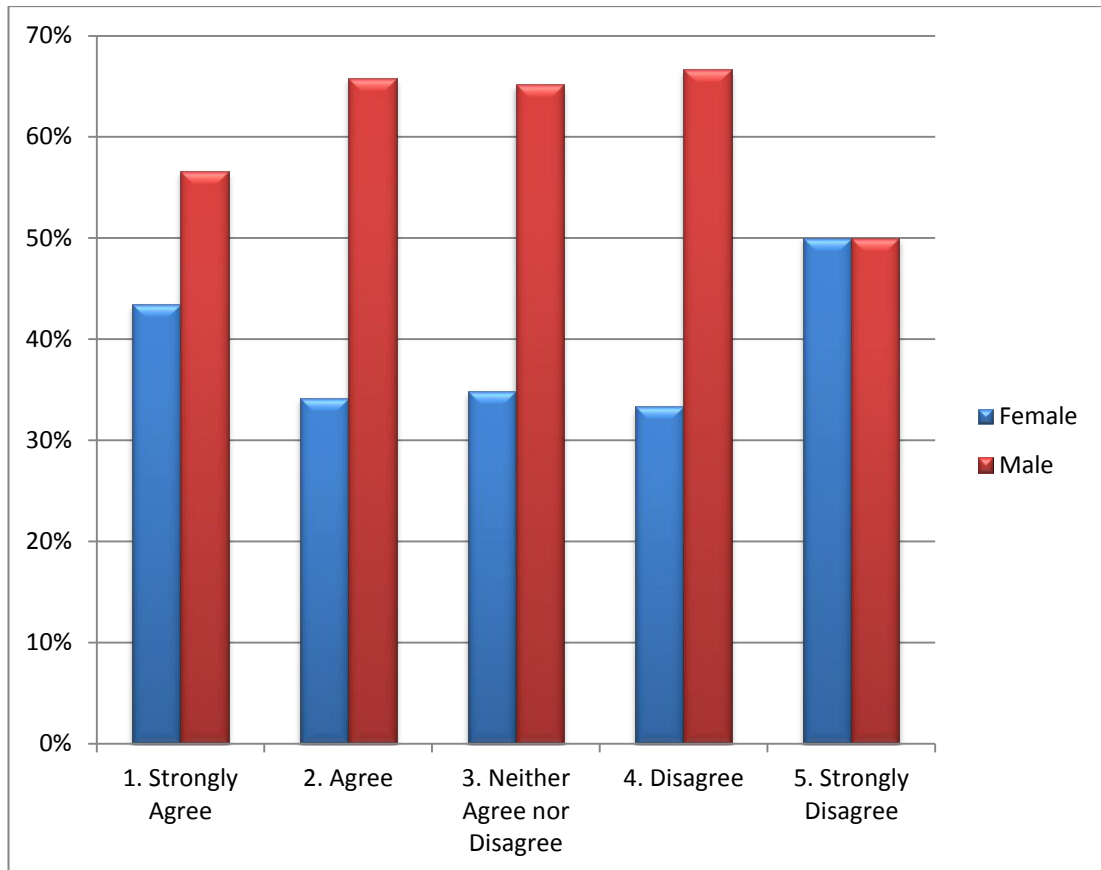


Figure 4.29: Motivational Views of Technology by Gender

Figure 4.29 shows the percentages of each gender that chose a specific option. In this bar chart an interesting, albeit mathematically insignificant, trend can be seen. It appears that the differing views of male and female respondents diverge through the options however this can be explained by the fact that there were more males in the sample data.

Figures 4.30 and 4.31 show the views of the sample separated out into subject area. This bar chart shows each subject areas' combined responses as a percentage of their own whole. It can be seen therefore that Health & Social Care is the subject area where the largest proportion of respondents strongly agree that they are more motivated when using technology. It also therefore shows that the Legal Studies students gave the smallest proportion of strongly agree responses to being motivated when using technology.

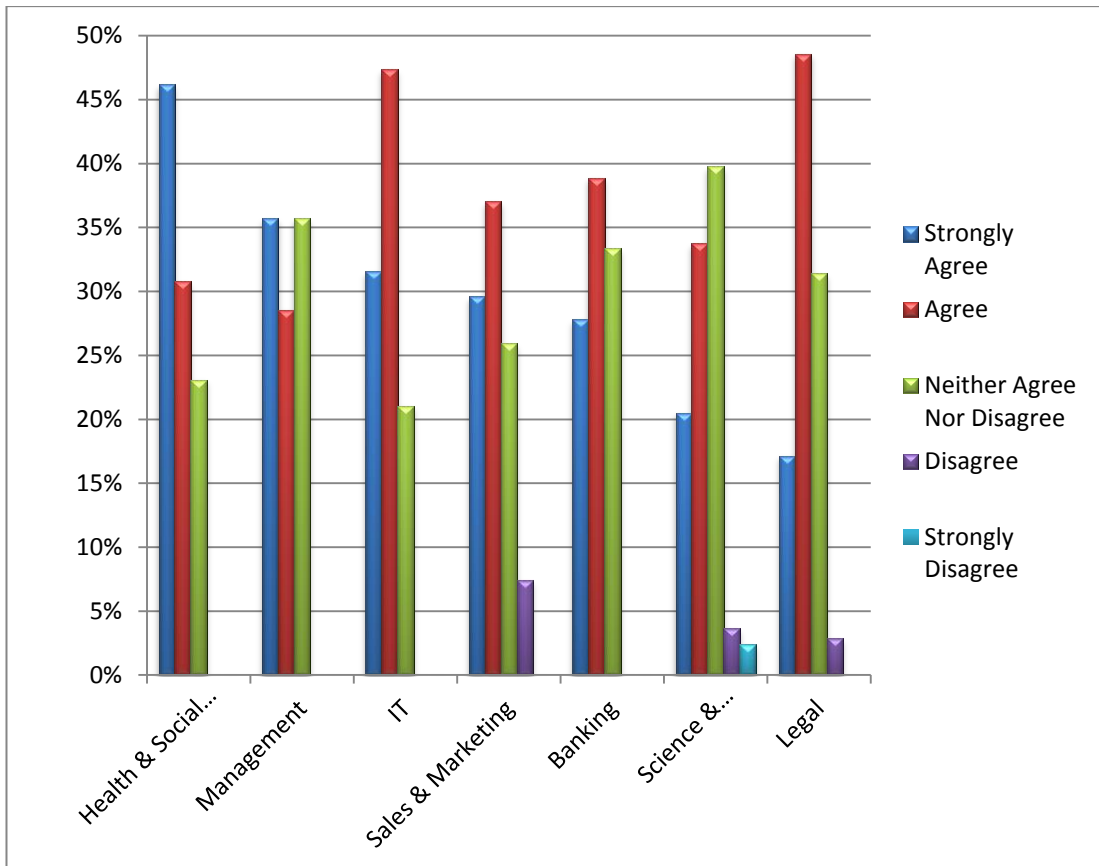


Figure 4.30: Motivational Views of Technology by Subject

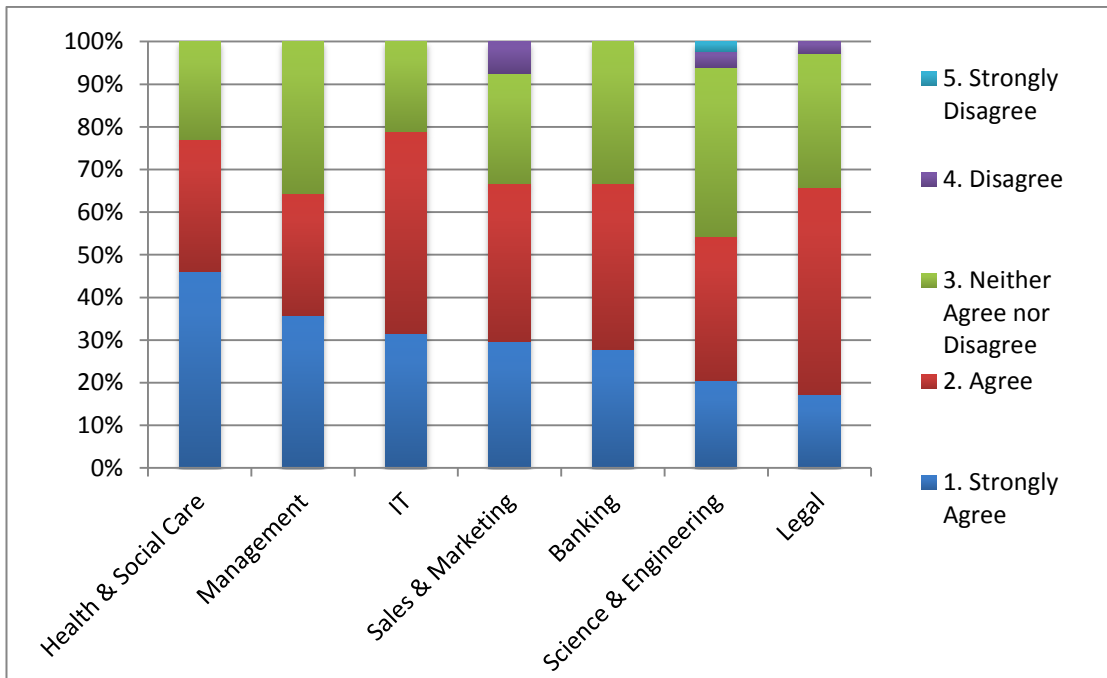


Figure 4.31: Motivational Views of Technology (Stacked)

This information is broken down further in Figures 4.32 to 4.36, showing a magnified view by response and subject area.

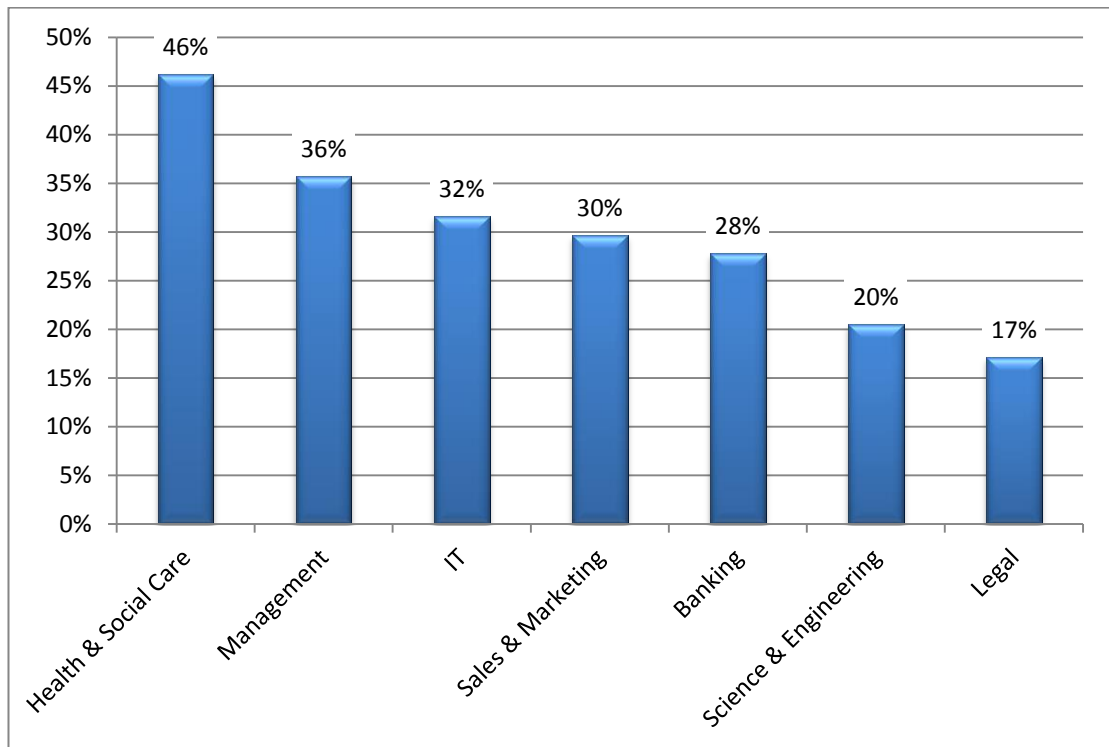


Figure 4.32: Likert Q10. Strongly Agree by Subject

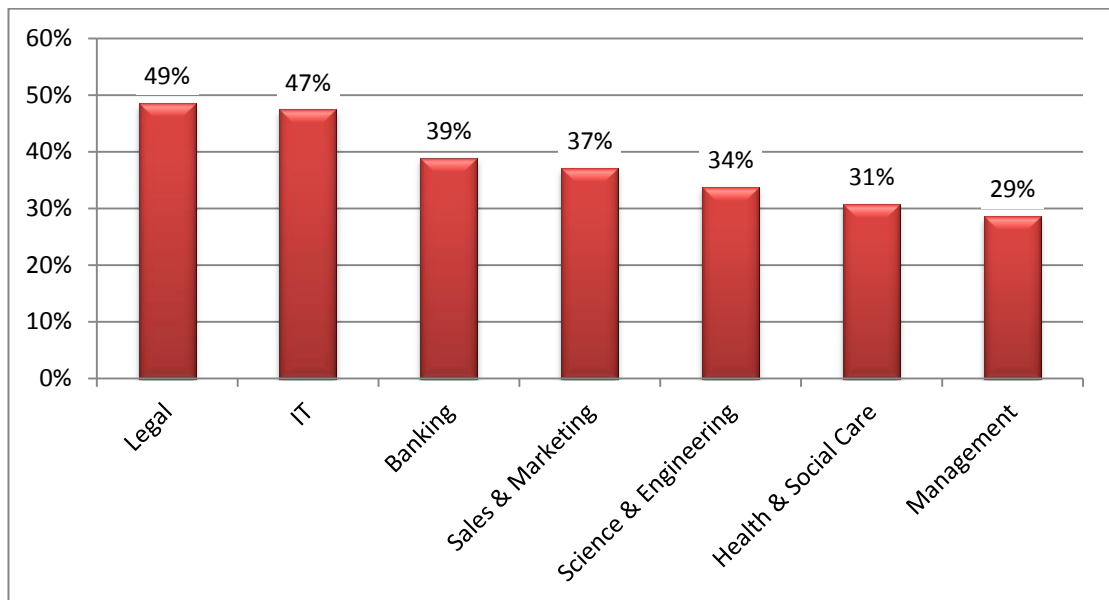


Figure 4.33: Likert Q10. Agree by Subject



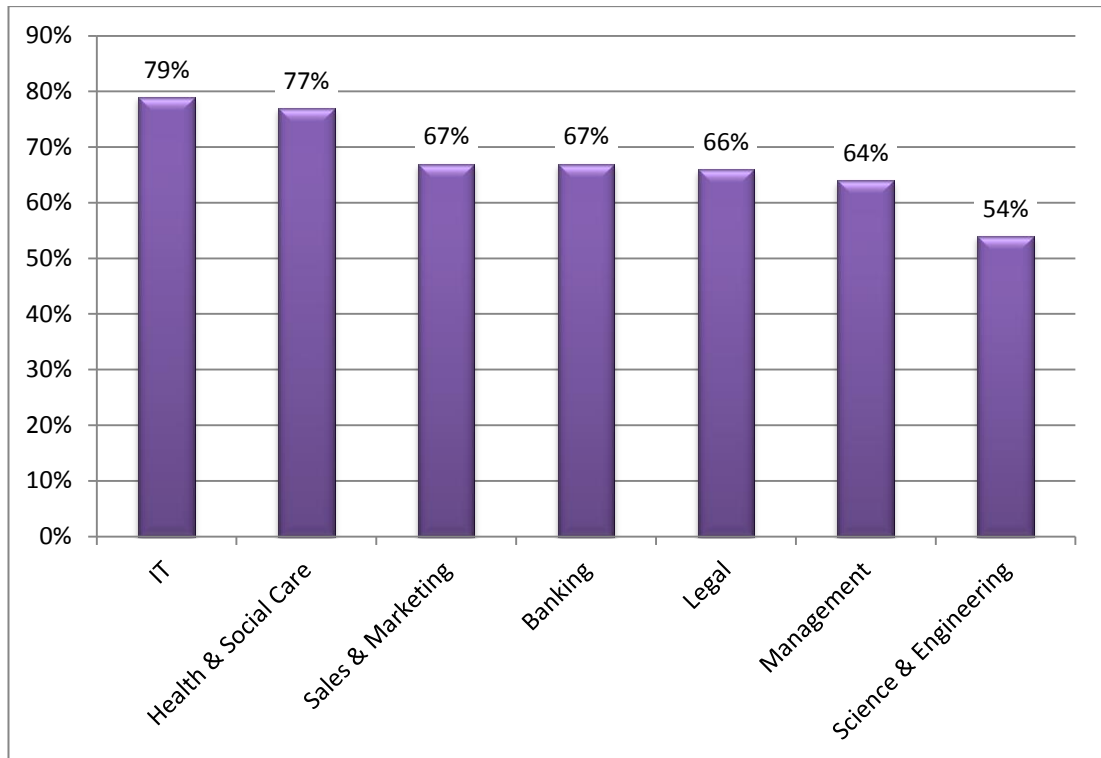


Figure 4.34: Likert Q10. Strongly Agree & Agree (combined)

The bar chart above (Figure 4.34) shows the combined results for all students that said they either strongly agreed or agreed, i.e. positive responses, to the statement that they felt more motivated when technology was used in their studies.

It can be seen that whilst more than 50% of all subject area cohorts responded that they feel more motivated when using technology, the subjects with the greatest responses and therefore stronger motivational feelings when using technology are the IT and Health & Social Care students.

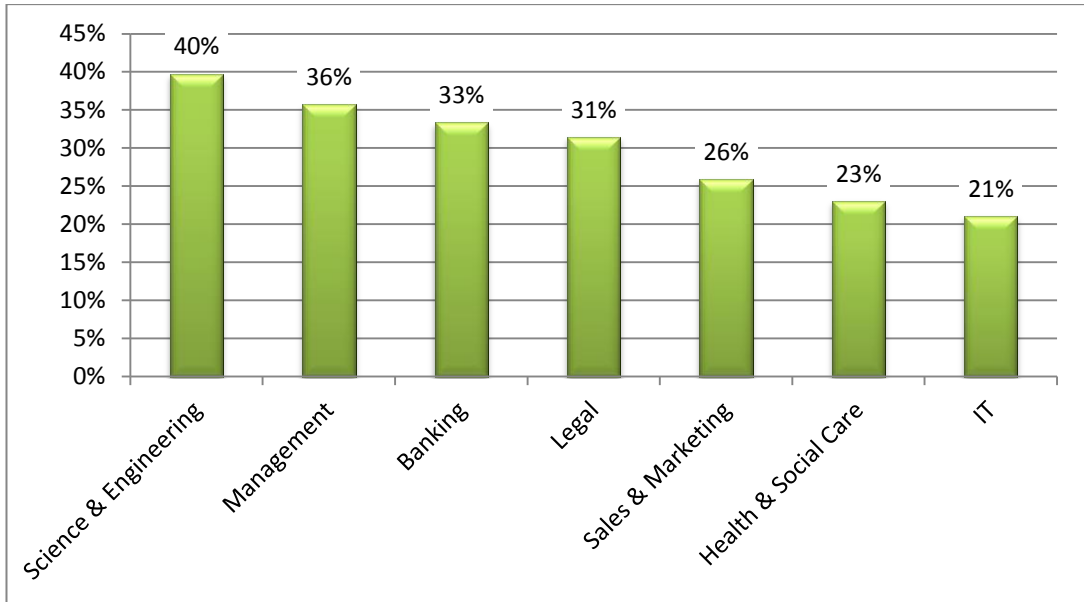


Figure 4.35: Likert Q10. Neutral by Subject

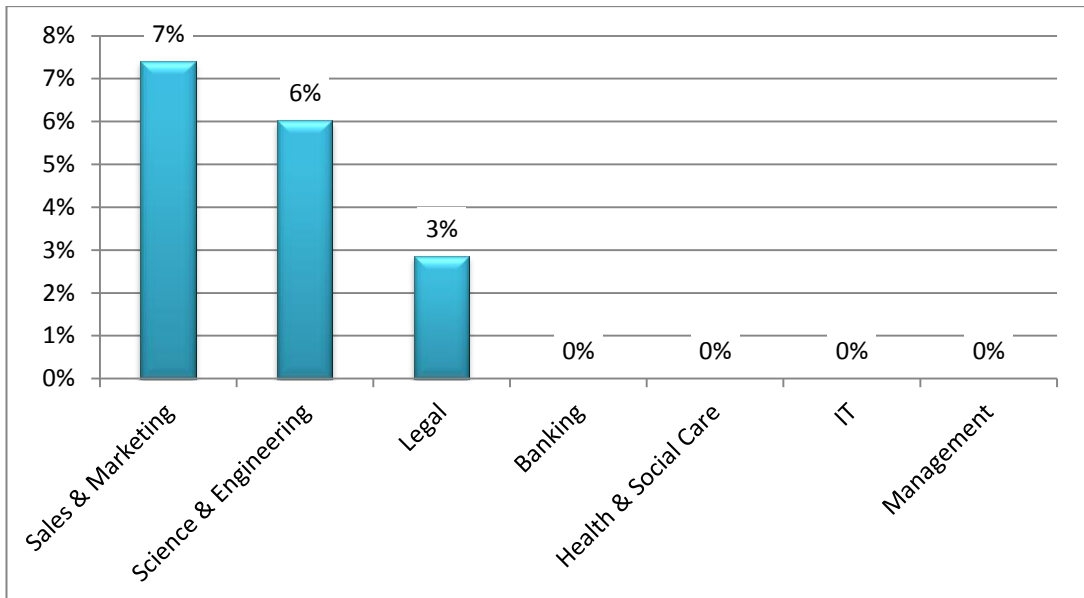


Figure 4.36: Likert Q10. Disagree & Strongly Disagree by Subject

#### 4.14 Performance when using Technology

**Statement: I feel I perform better in class when technology is used**

It can be seen in Figure 4.37 (taken from Table 4.14) that 60% of those surveyed agreed that they feel they perform better when using technology, with only 4% (nine respondents) stating that they do not feel they perform better when using technology.

*This information is again broken down into more detail in further representations in this chapter with particular focus on gender and subject area of those surveyed.*

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
54	71	75	7	2
26%	34%	36%	3%	1%

Table 4.14: On Performing Better When Using Technology

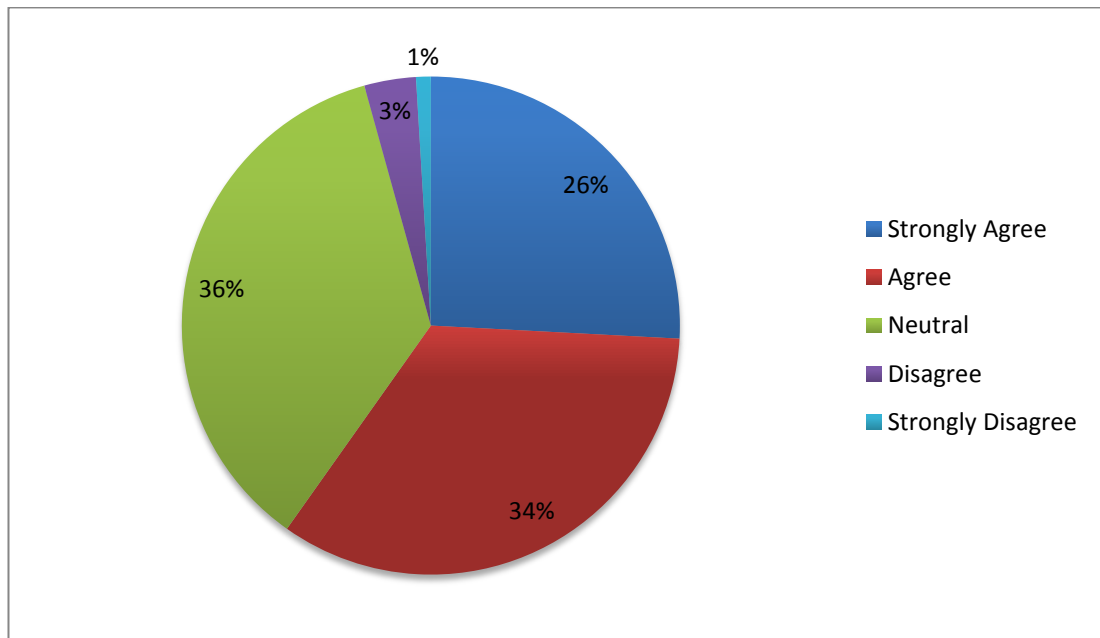


Figure 4.37: Performance When Technology is Used

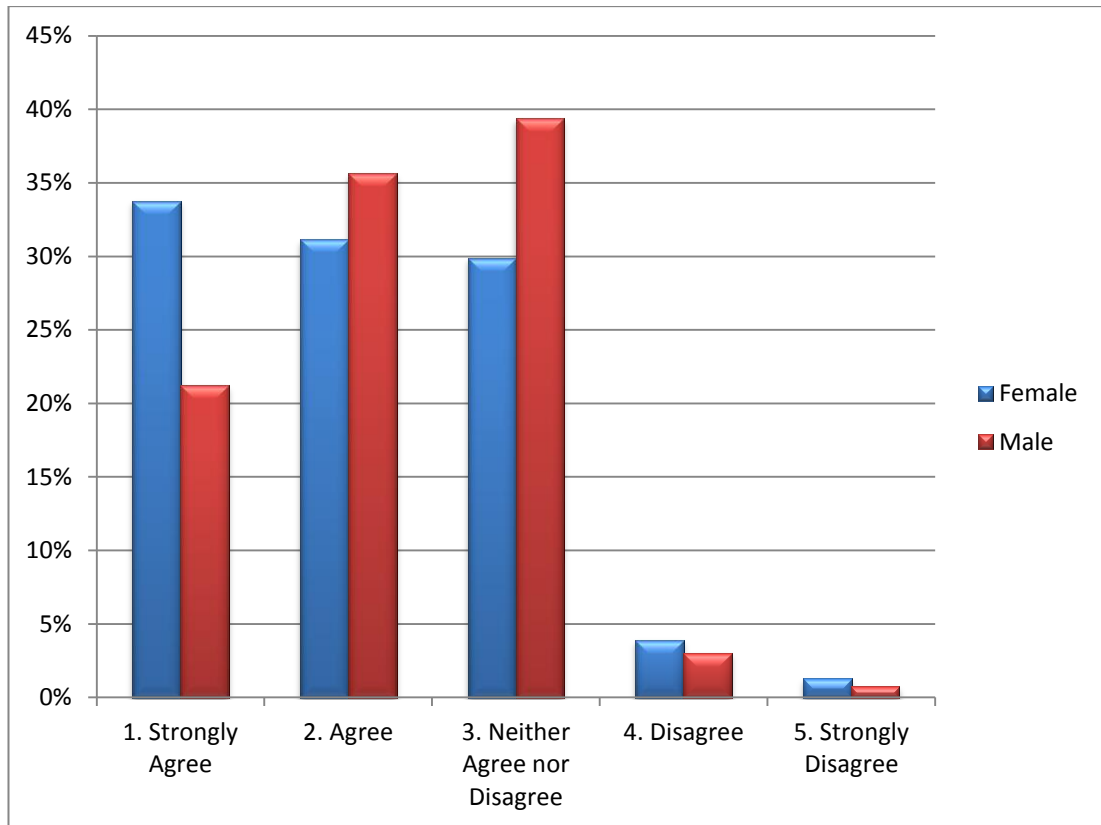


Figure 4.38: Performance When Technology is Used by Gender

Figure 4.38 shows the percentages of each gender and their views on how motivational they find they perform when using technology in their studies. It can be seen that there is a large proportion of females with a strong positive opinion on their performance benefits of technology. However, this is evened out when added to the agree and neutral feelings towards their increased performance when using technology in their studies.

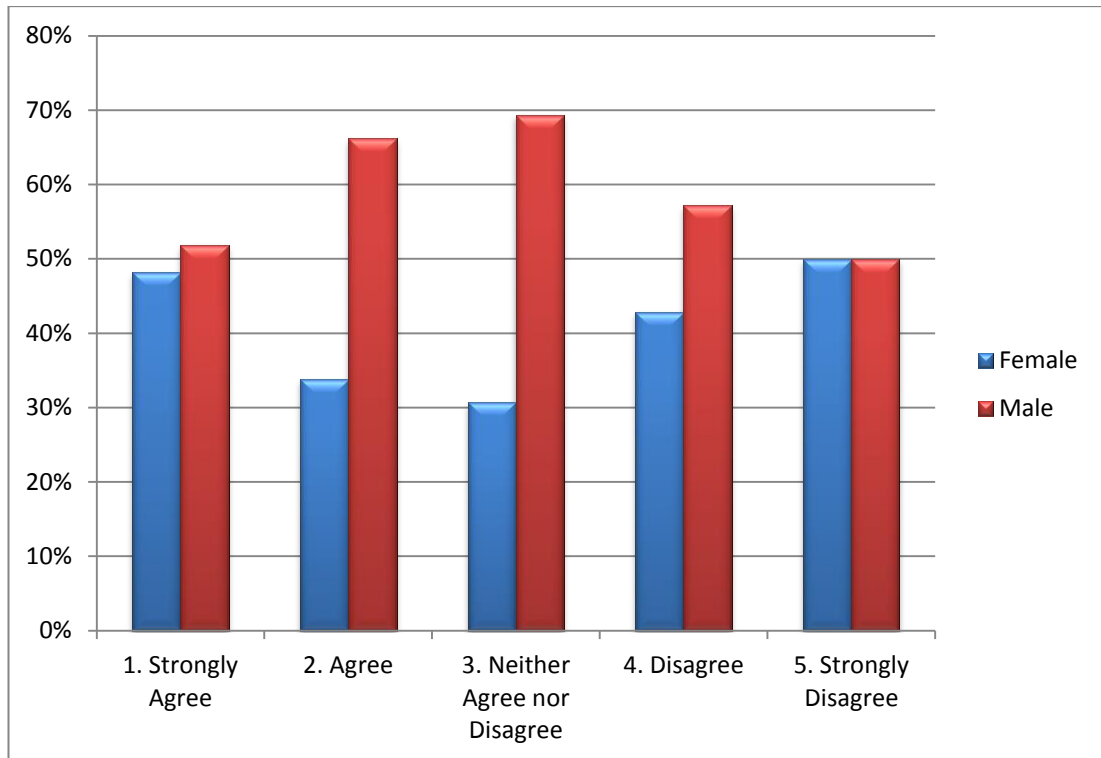


Figure 4.39: Performance When Technology Is Used by Gender

Figure 4.39 shows the percentage of each response separated by gender. As with Figure 4.29 previously it appears that there is a gender disparity moving towards the more neutral responses. Again this can be explained away mathematically by the disparity in response numbers by gender, but also that female respondents appear have stronger views, particularly at the positive end of the Likert scale spectrum.

Figures 4.40 and 4.41 shows the views of the sample separated out into subject area. This bar chart shows each subject areas' combined responses as a percentage of their own whole. It can be seen therefore that Health & Social Care is the subject area where the largest proportion of respondents strongly agree that they feel they perform better when using technology. It also shows that the Science and Engineering students gave the smallest proportion of strongly agree responses to feeling they perform better when using technology.

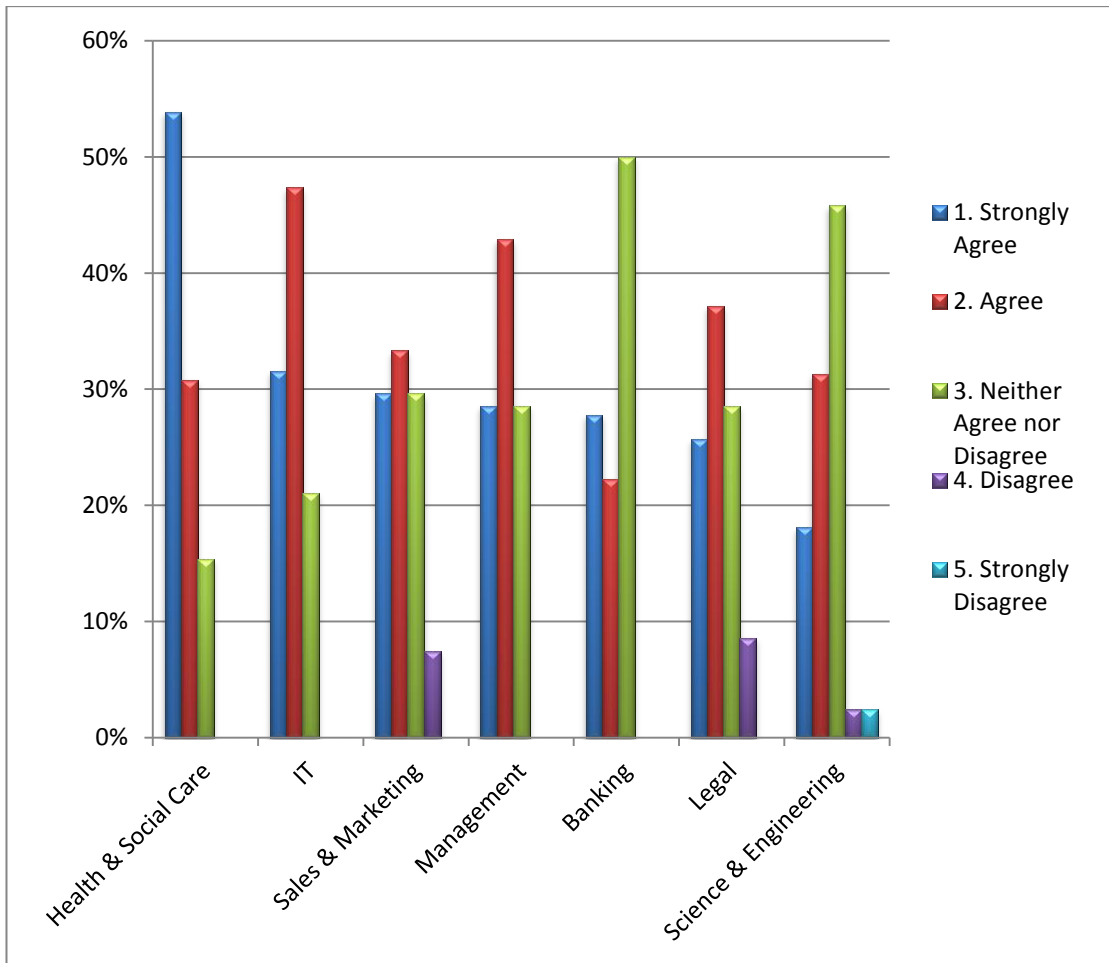


Figure 4.40: Performance When Technology is Used by Subject

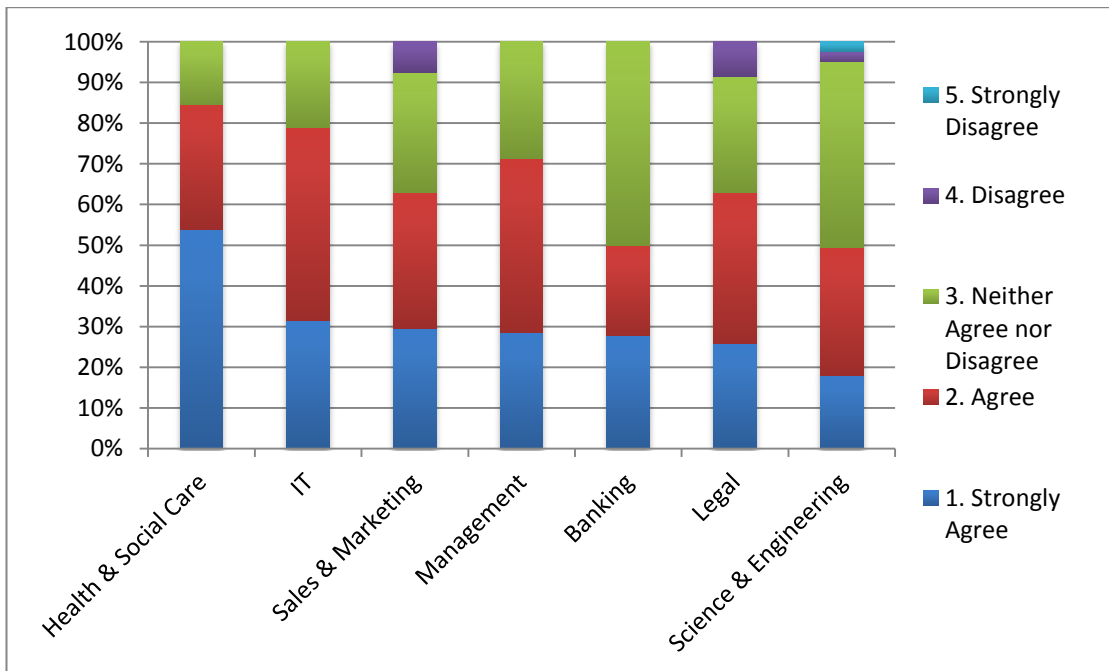


Figure 4.41: Performance When Technology is Used (Stacked)

This information is broken down further in Figures 4.42 to 4.46, showing a magnified view by response and subject area.

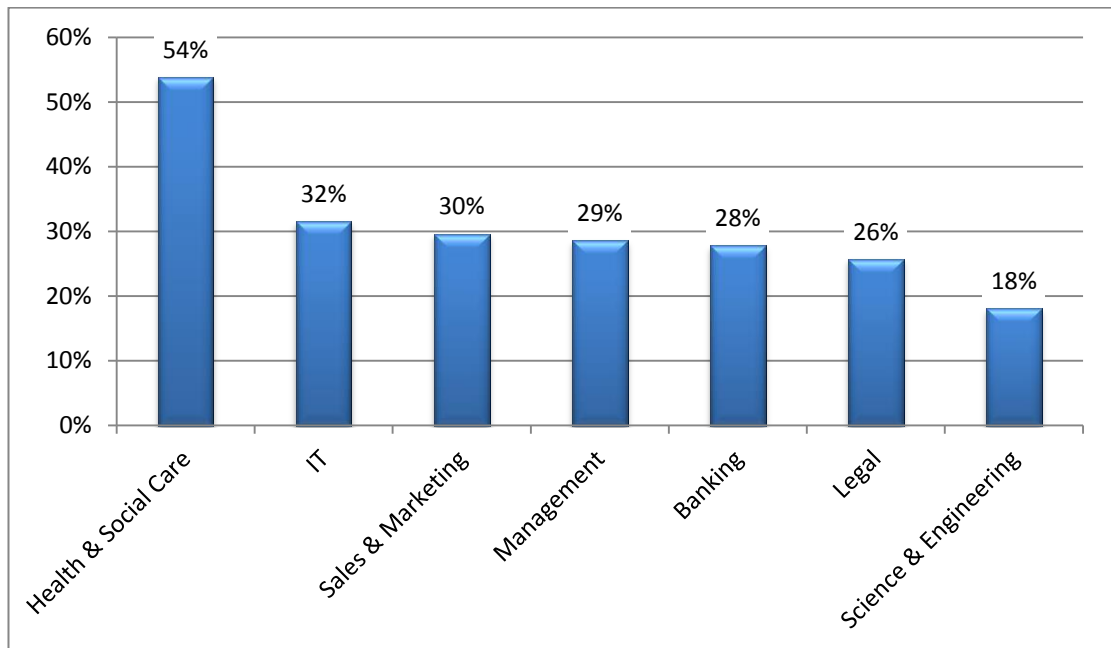


Figure 4.42: Likert Q11. Strongly Agree by Subject

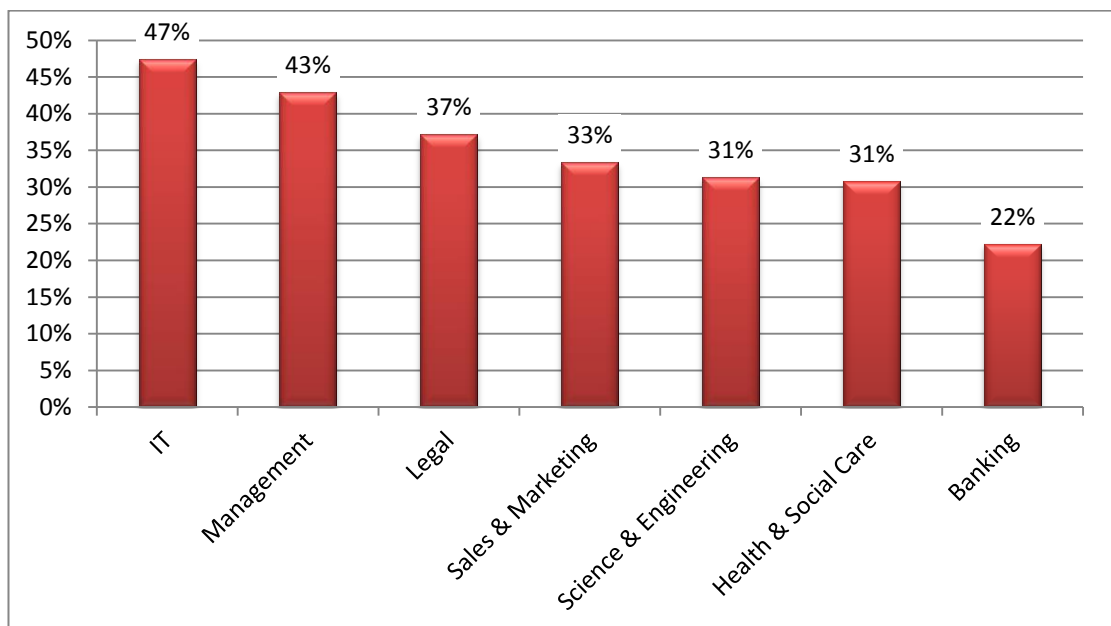


Figure 4.43: Likert Q11. Agree by Subject

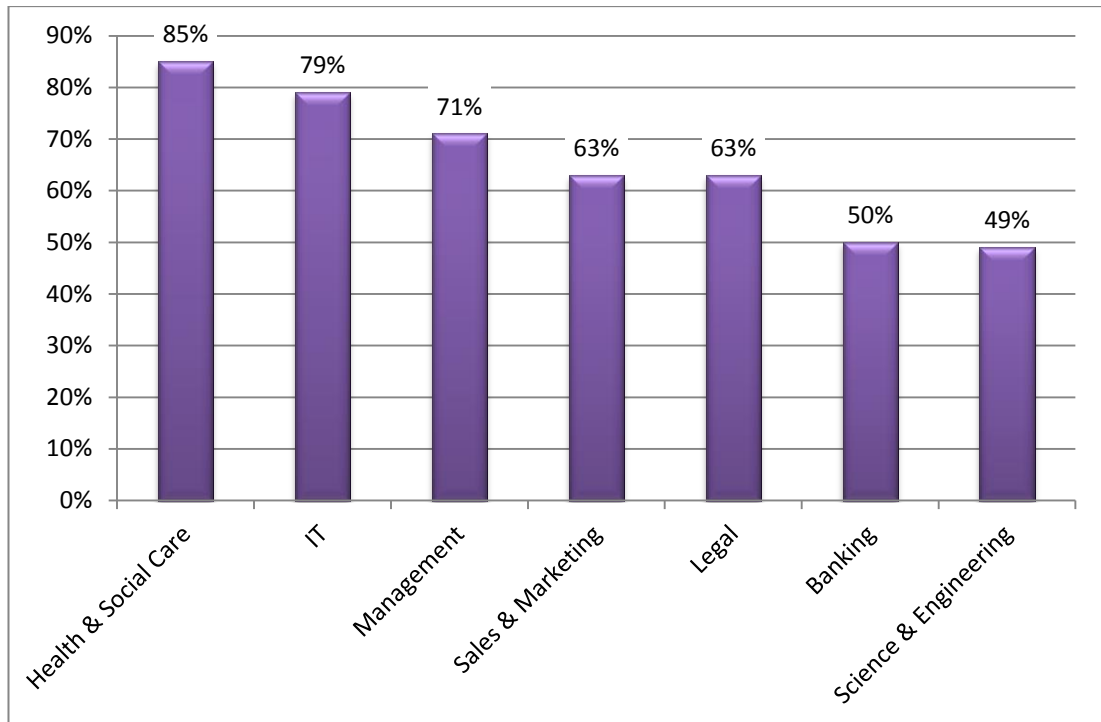


Figure 4.44: Likert Q11. Strongly Agree & Agree (combined)

The bar chart above (Figure 4.44) shows the combined results for all students that said they either strongly agreed or agreed, i.e. positive responses, to the statement that they felt they performed better in their studies when technology was used.

It can be seen that whilst more than 50% of most subject area cohorts responded that they feel they perform better when using technology, the subjects with the greatest responses and therefore stronger belief that their performance is improved when using technology are (the same as with feelings of motivation, Figure 4.34) the Health & Social Care and IT students.

It is also seen that with the Banking and Science & Engineering students, 'only' 50% of these students feel they perform better when using technology in their studies.



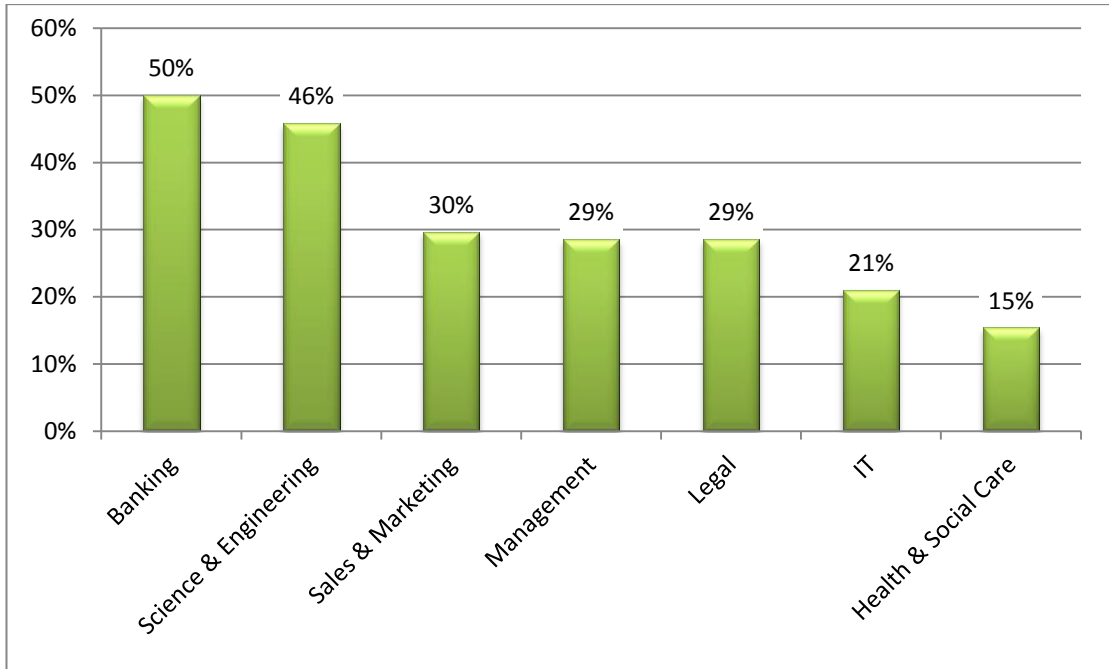


Figure 4.45: Likert Q11. Neutral by Subject

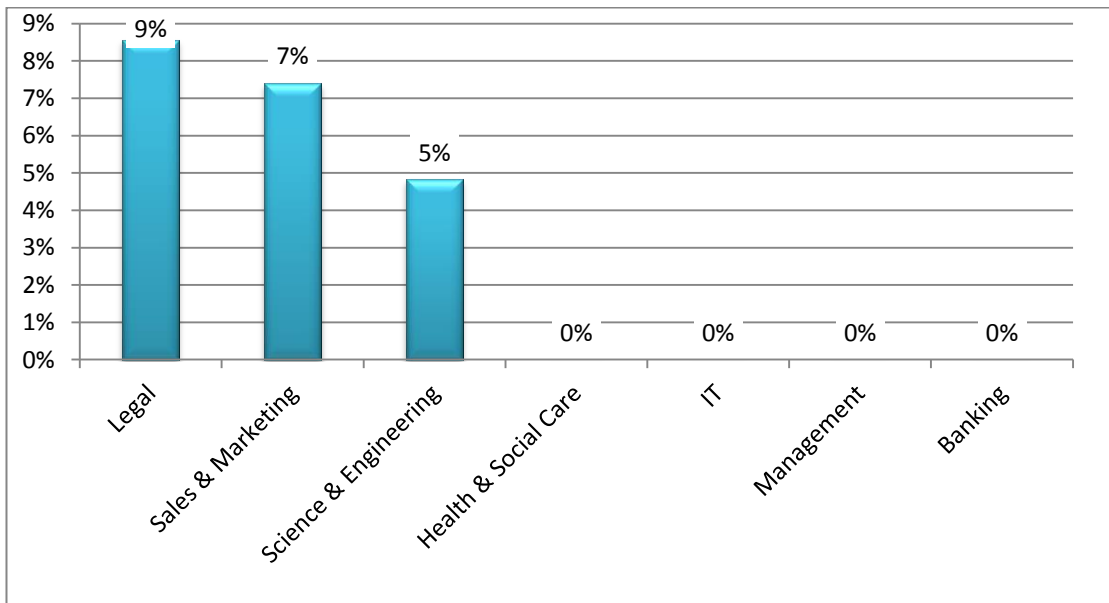


Figure 4.46: Likert Q11. Disagree & Strongly Disagree by Subject

#### 4.15 More use of Technology in class

**Statement: I would like to see more use of technology in class**

It can be seen in Figure 4.47 (taken from Table 4.15) that 67% of those surveyed agreed that they would like to see more use of technology in class, with only 3% (seven respondents) stating that they would not like to see more use of technology in class.

*This information is again broken down into more detail in further representations in this chapter with particular focus on gender and subject area of those surveyed.*

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
60	80	62	5	2
29%	38%	30%	2%	1%

Table 4.15: On Wishing to See More Use of Technology

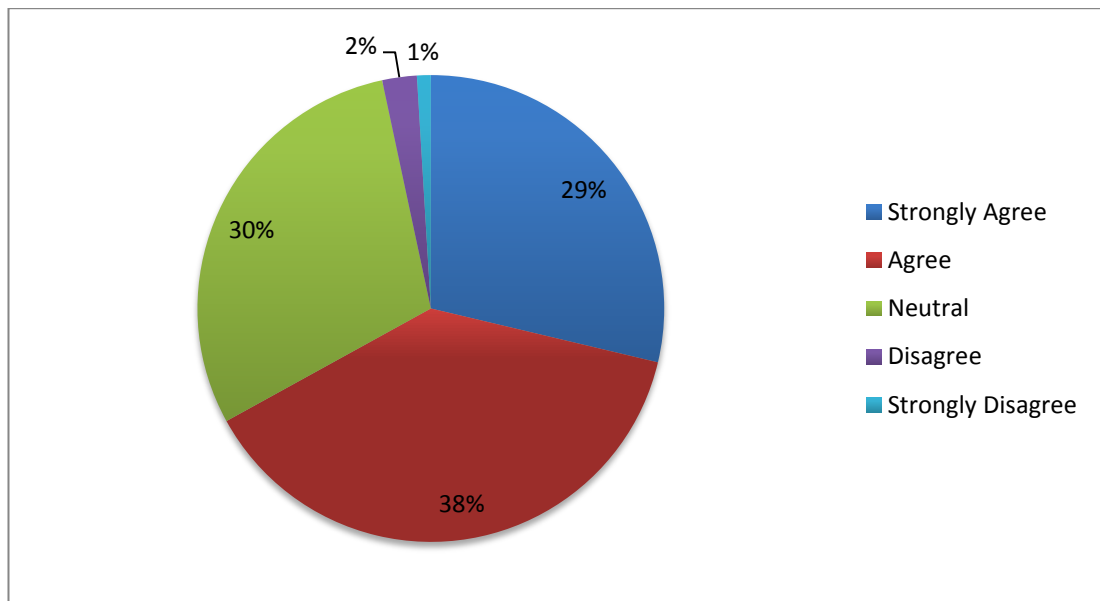
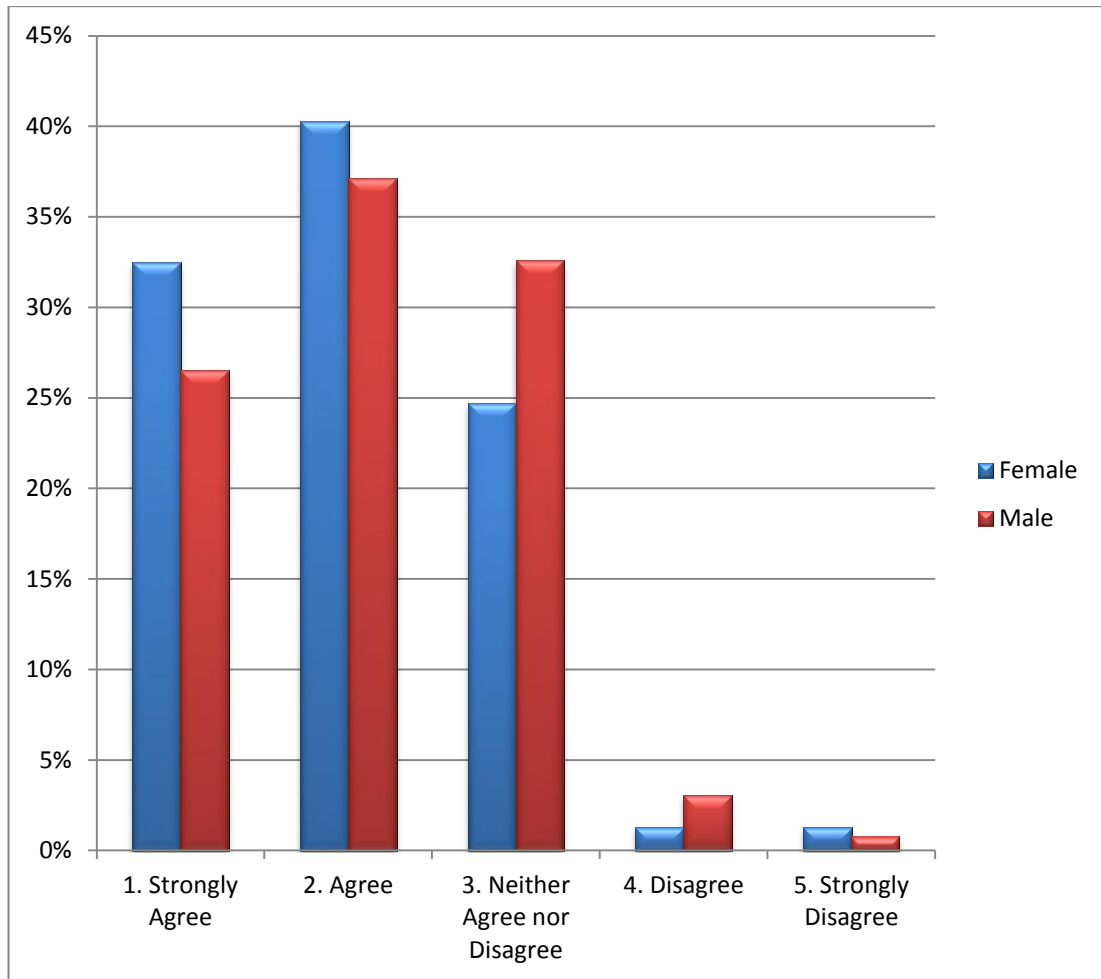


Figure 4.47: More Use of Technology



**Figure 4.48: More Use of Technology by Gender**

Figure 4.48 shows the percentages of each gender and their views on whether they would like to see more use of technology in their studies. It can be seen that there is little difference between the genders with females slightly more positive on the want to use more technology to aid their studies.

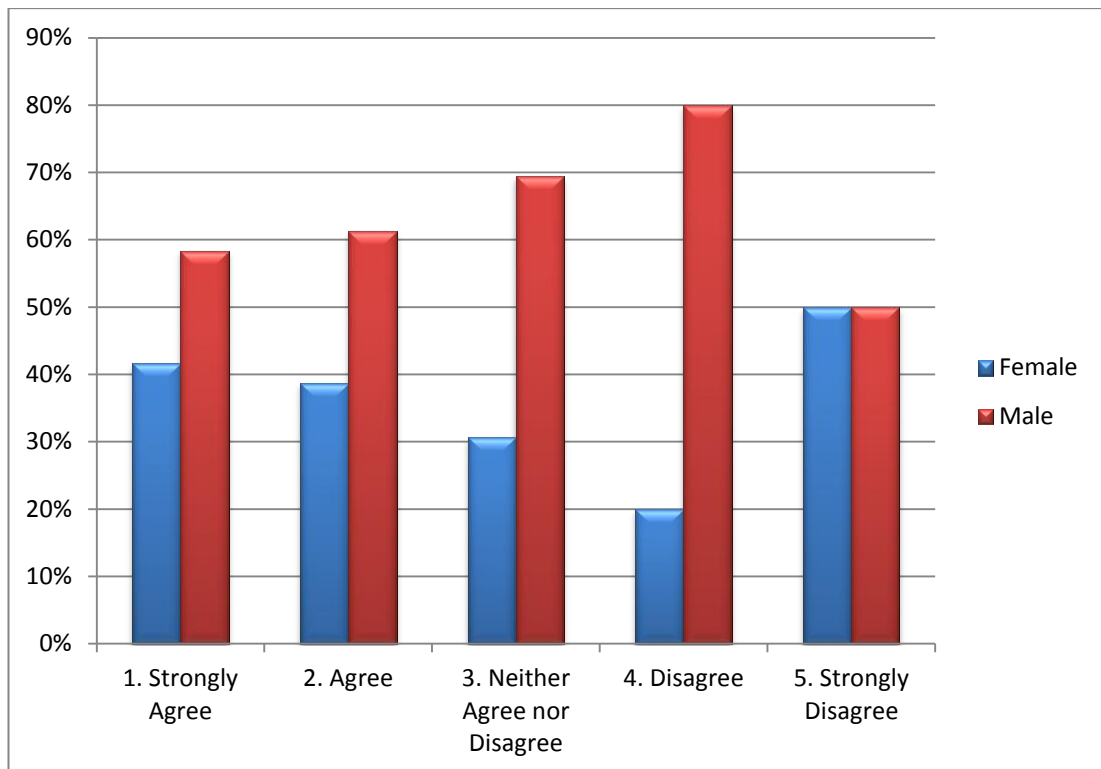


Figure 4.49: More Use of Technology by Gender

Figure 4.49 shows the percentage of each response separated by gender. As with Figures 4.29 and 4.39 previously it appears that there is a gender disparity moving towards the more neutral responses. Again this can be explained away mathematically by the disparity in response numbers by gender, but also that female respondents appear have stronger views, particularly at the positive end of the Likert scale spectrum, whereas the male respondents tended to feel more neutral in their opinions on this. Particular note could be made of the percentage disparity when it came to disagreeing with the statement of wanting to see more use of technology where 80% of those than responded in this way were male.

Figures 4.50 and 4.51 show, the views of the sample separated out into subject area. This bar chart shows each subject areas' combined responses as a percentage of their own whole. It can be seen that Management is the subject area where the largest proportion of respondents strongly agree that they would like to see more use of technology. It also shows that the Sales and Marketing students gave the smallest proportion of strongly agree responses to feeling they would like to see more use of technology.

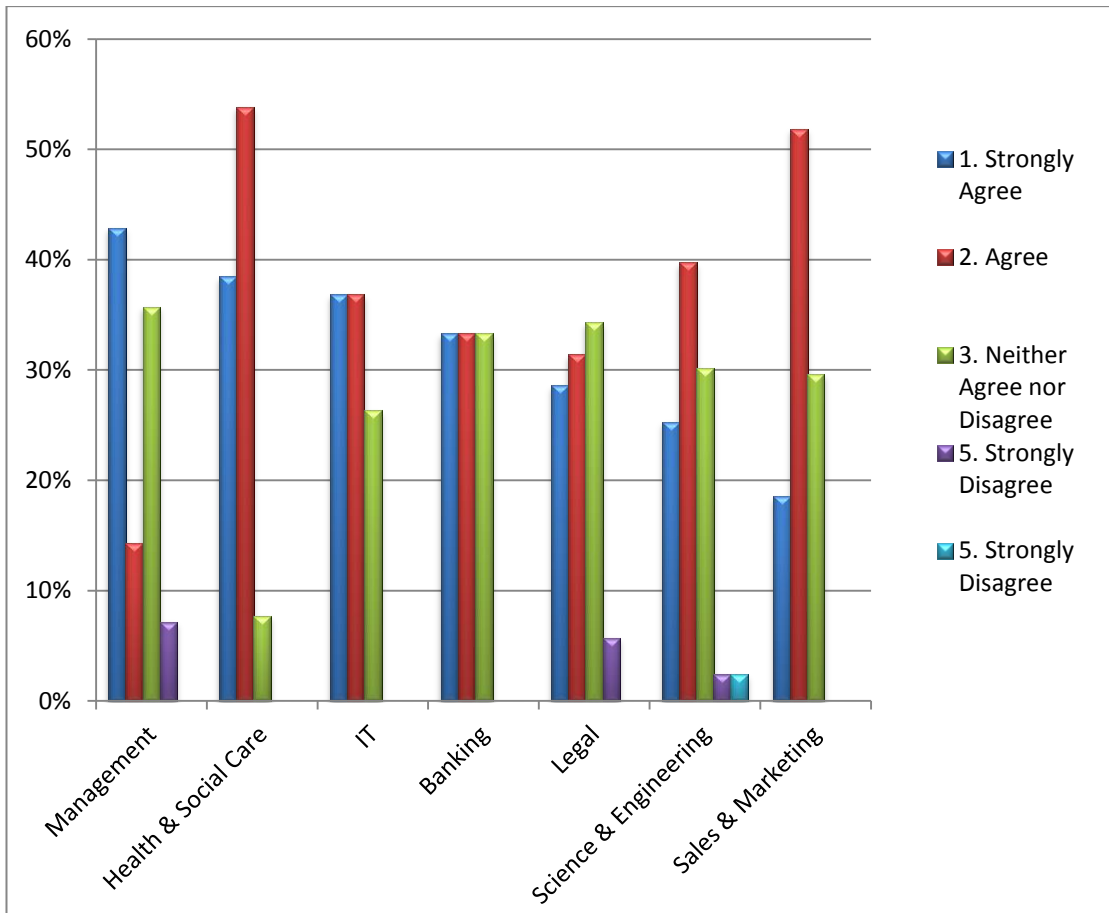


Figure 4.50: More Use of Technology by Subject

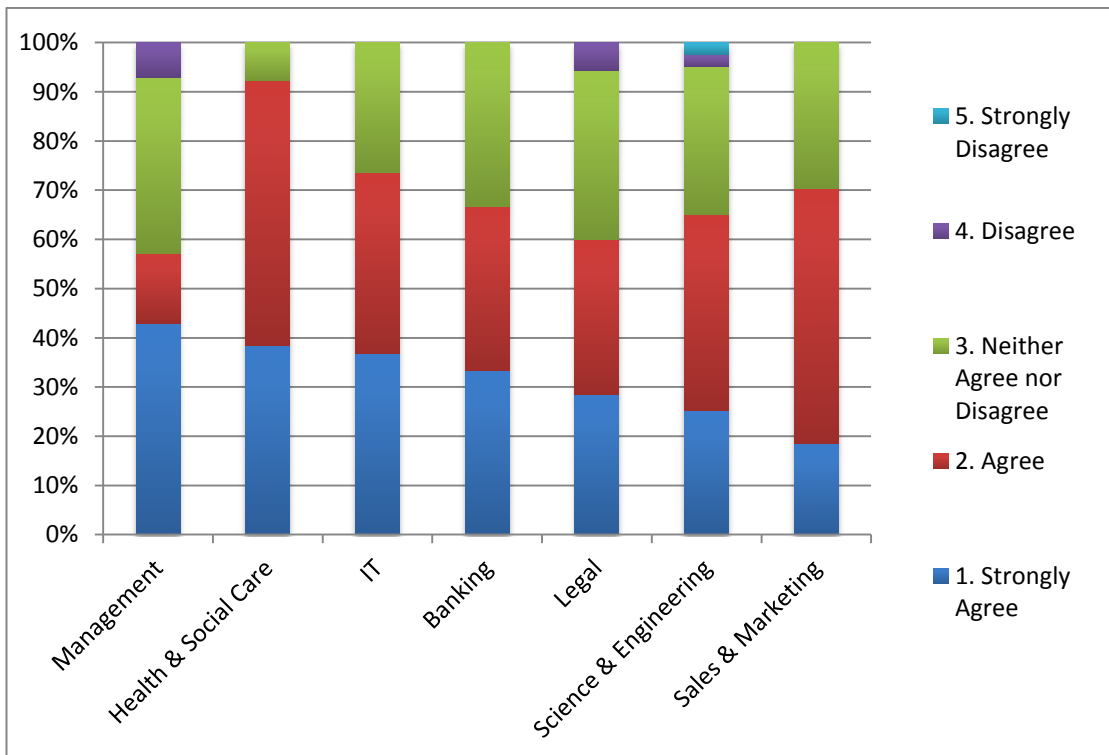


Figure 4.51: More Use of Technology (Stacked)

This information is broken down further in Figures 4.52 to 4.56, showing a magnified view by response and subject area.

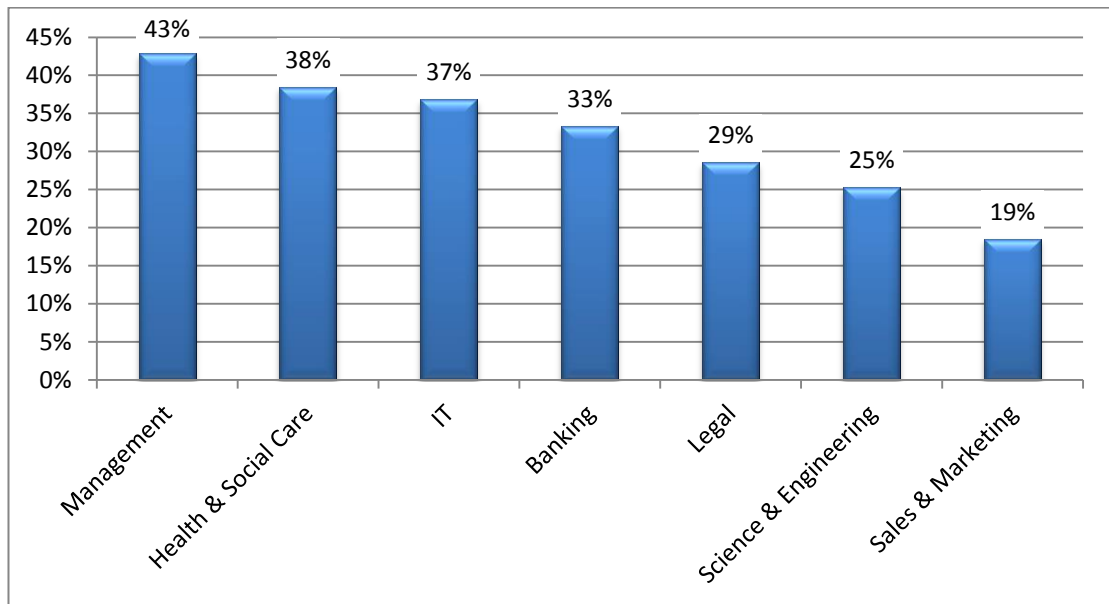


Figure 4.52: Likert Q12. Strongly Agree by Subject

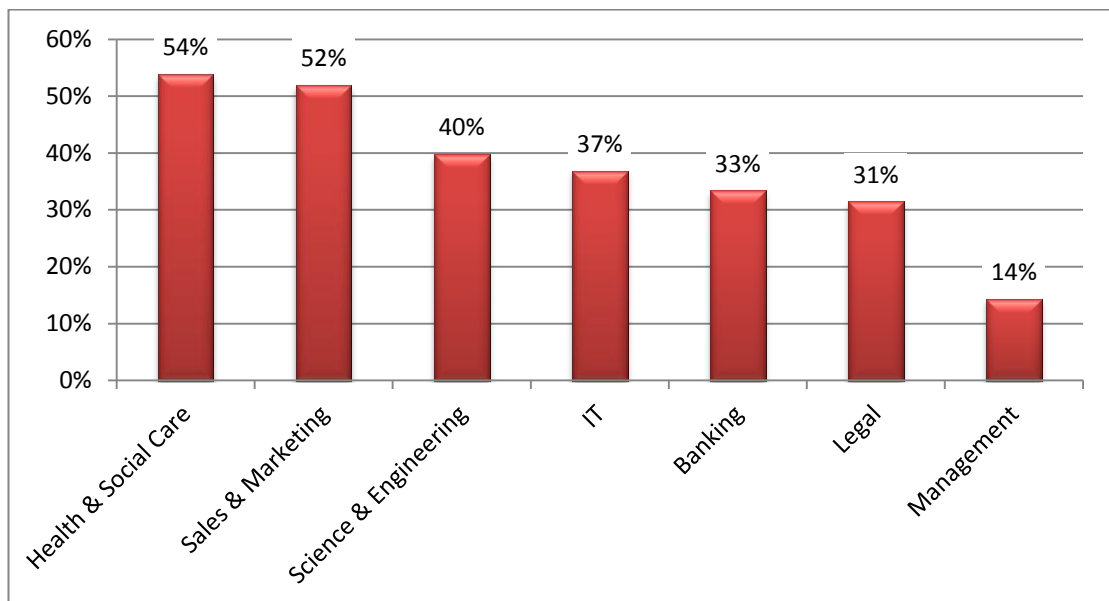
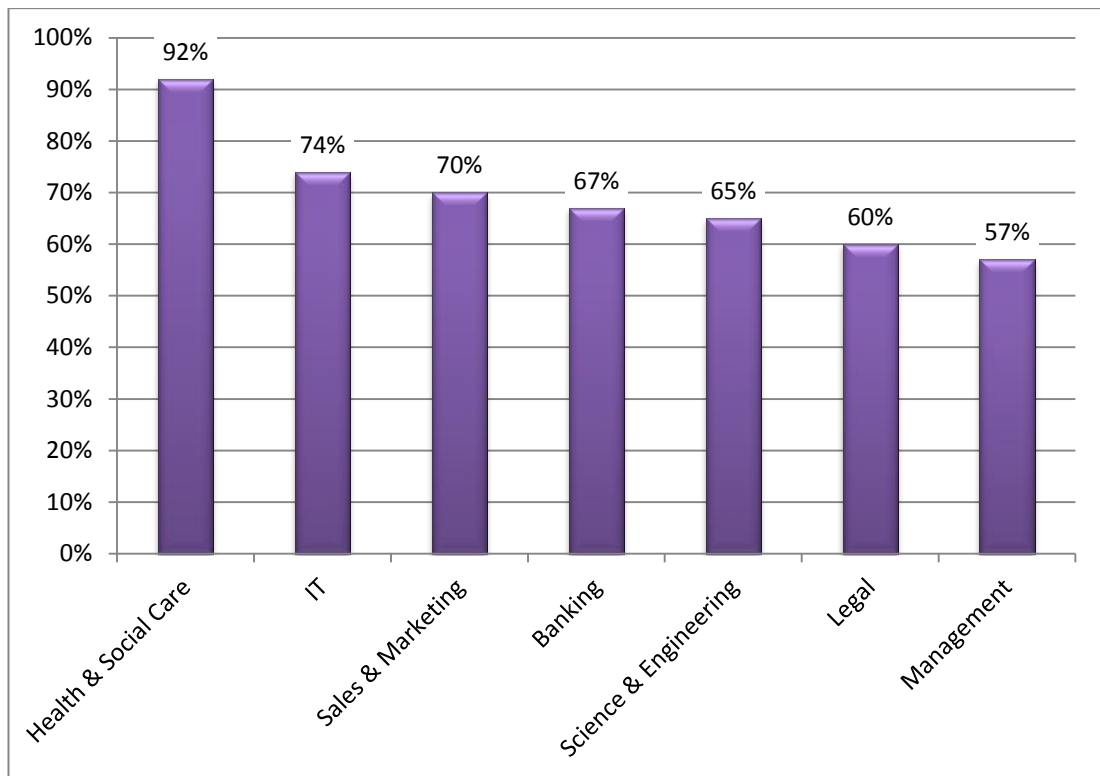


Figure 4.53: Likert Q12. Agree by Subject



**Figure 4.54: Likert Q12. Strongly Agree & Agree (combined)**

The bar chart above (Figure 4.54) shows the combined results for all students that said they either strongly agreed or agreed, i.e. positive responses, to the statement that they would like to see greater use of technology in their studies.

It can again be seen (as in Figures 4.34 & 4.44) that whilst more than 50% of all subject area cohorts responded that they feel they would like to see greater use of technology in their studies, the subjects with the greatest responses and therefore stronger motivational feelings when using technology are once again the Health & Social Care and IT students.

This time however, there can be seen a much larger gap between the Health & Social Care and IT students, which could be because the IT students by the very nature of an IT course, already use a wider range and larger amount of technology in the course of their studies.

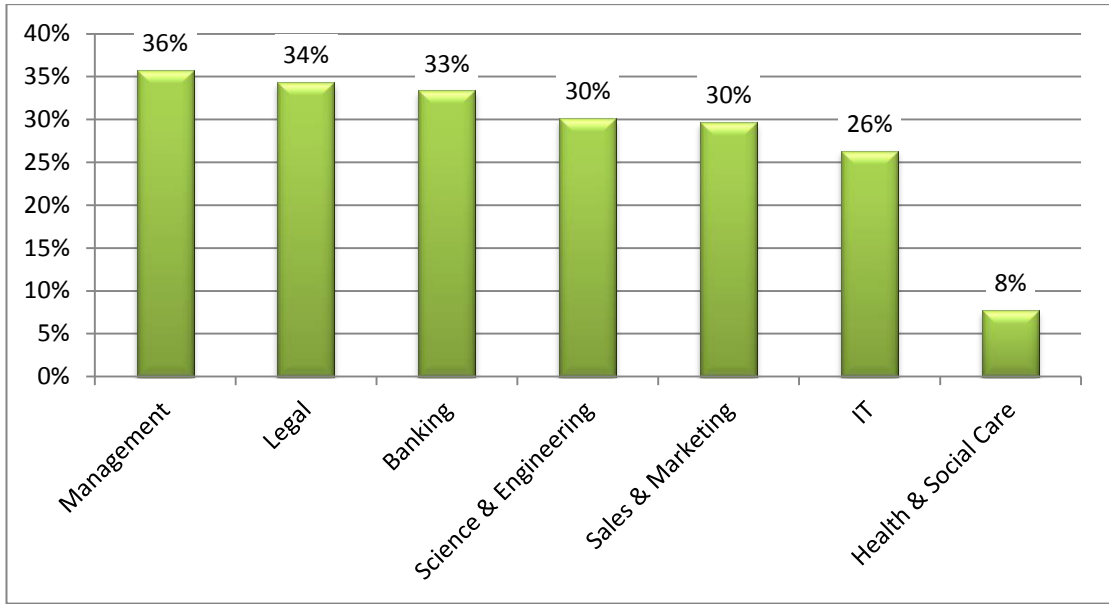


Figure 4.55: Likert Q12. Neutral by Subject

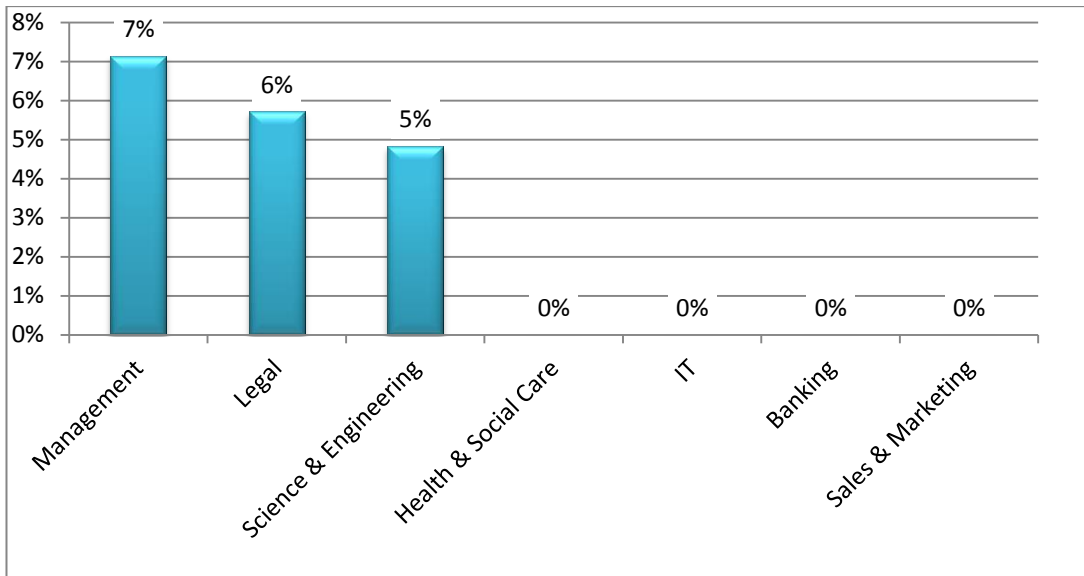


Figure 4.56: Likert Q12. Disagree & Strongly Disagree by Subject



#### 4.16 Qualitative Question One

*Which, if any, areas would you like to see greater use of technology in your studies?*

*Appendix B shows the full, transcribed answers gained from this qualitative research question, asked as a free response question.*

Some of the responses to this question include:

- More interactive activities
- SmartBoards
- Social networking
- During lectures
- During tutorials
- Video lessons
- More videos
- More books available online

But also many responses stating suchlike:

*“I have sufficient technology in my opinion.”*

*“I am happy with the use of technology as of now.”*

*“We have a lot of access to most technology anyway.”*

And one student stating,

*“I fear the day that technology will surpass our human interactions. The world will have a generation of idiots.”*

Albeit this can actually be attributed to Albert Einstein, (source: 2010, The Ultimate Quotable Einstein, Edited by Alice Calaprice, Princeton University Press, Princeton, New Jersey. (Verified on paper))

#### 4.17 Qualitative Question Two

*What technology, if any, could motivate you to work harder in both classroom and self-study?*

*Appendix C shows the full, transcribed answers gained from this qualitative research question, asked as a free response question.*

Some of the most common responses to this question include:

- Tablets
- Laptops
- MP3
- Recording lectures for later viewing (or listening)
- E-Books

It was clear that tablet and laptop computers appear high on the students' 'wish-list' of technology they would like use of during lessons. And numerous students also mentioned the desire to see lessons recorded either using audio or video formats for referring to later during their studies, coursework and/or revision, where relevant.

Whether any of these options would lead to motivational improvements remains to be seen, however some form of action research in this area could be a good idea, to see if this yields results.

## 5 Conclusion, Recommendations and Reflections

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*This chapter will summarize the interpretation of the results derived. It will also reflect on the degree to which the aim and objectives have been satisfied, along with identifying any further work needed to extend the development and testing of the results obtained. This chapter will also include a critical reflection of how the research methods were used and the influence they may have had on the results attained.*

### 5.1 **Conclusions**

The results detailed in Chapter 4 show that there is a belief in the students' eyes that they perform better, enjoy their studies more and feel more motivated when technologies are used within their studies both in the classroom setting and in their independent studies and research. The students' responses also suggest that they would like to see greater use of technology in their studies.

The aim of this project was:

*“To research and critically compare specific areas in which technology can be used to improve the motivation and retention of students within a Higher Education setting.”*

The results of the research in both Chapter 2 (Literature Review) and Chapter 4 (Primary Research Results) show there is certainly merit in the use of technology to motivate learners in Higher Education.

When asked if students felt more motivated when using technology, if students felt they performed better when using technology or they would like to see greater use of technology in their studies, on all questions IT students and Health and Social Care students scored highest. These students all either agreed or strongly agreed with these statements.

It can be seen that 79% of IT students and 77% of Health and Social Care students feel more motivated when using technology. 79% of IT students and 85% of Health and Social Care students believe they perform better when

using technology. And 74% of IT students and 92% of Health and Social Care students would like to see greater use of technology in their studies.

In May 2013, in an interview for the BBC, Wikipedia's founder (*Jimmy*) Wales (2013) stated that, "universities need to use online technology where it really works." He goes on to argue that as more students are net native, the first things that will have to change, and perhaps be consigned to the scrapheap forever are, 'boring university lectures'.

Wales suggests that, in response to the growth of MOOCs (*as discussed in Chapter 2*), more lectures should be recorded and that students should use these recordings as the basis of their learning, with the teacher time being used to develop this learning in a more informal setting. (Wales, 2013)

This viewpoint is certainly borne out by numerous respondents to the surveys of this project, stating that they would like video and/or MP3 recordings of lectures as a central part of their education. In the second decade of the 21st Century, the culture we live in is one where individuals want to be able to obtain anything 'on demand'. For over a decade we have had television and music on demand, with the purchaser being able to shop around for the best service that fulfils their needs, be that YouTube, Spotify, Virgin Media, Sky or a whole plethora of on demand media services.

As the UK has seen a rise in tuition fees since 2010, there is every chance that students could follow the same market driven attitude towards their education, with more shopping around to get the best deal to suit their needs, whether that is flexible or part-time learning patterns or more pertinently greater online access to resources and lectures, with them needing to be available how the student wants, and when the student wants.

Students surveyed in this project often said they would like to see Tablet Computers and Laptop Computers available for them in classes. And as previously mentioned these same students would like audio (MP3) and video recordings of their lectures available for use after the event as independent learning aids. *See Appendices B and C.*

## 5.2 **Recommendations**

Some recommendations for teaching and learning would be to record more lectures, be that audio or video, during the event and make them available afterwards via the VLE (Moodle) for further reflection from students that were present at the lecture. This would have the knock on effect of making lectures available to students that had missed the lecture. This could in turn be used to free up more teacher time during allocated times for more individual learning, created from Individual Learning Plans (ILPs) / Personal Development Plans (PDPs).

Lectures need to, in themselves, focus on more constructivist theories of learning, as opposed to didactic learning, which has to date been the mainstay of most Higher Educational establishments.

Traditional lecture style learning in large lecture theatres with students simply taking notes may not be the best way to provide the high quality learning experience that today's fee-paying students demand, so smaller classrooms, following on the Further Educational models that students will have become accustomed to before entering Higher Education, could be the best way forward to provide the educational experience demanded. Furthermore, classrooms equipped with some form of desktop or laptop computer access could also satisfy the demands being brought from the modern net-native learner.

## 5.3 **Reflections**

There is a wealth of further research both primary and secondary, which could be undertaken further in this area however. There are many more facets to motivational theory that could be explored to further achieve the objectives of this project. Specifically, in the field of educational motivation, there is continuous professional development (CPD) on going for all educators.

Further research is certainly needed in this area and, as previously mentioned, it would be recommended that action research be undertaken to test the use of certain technologies over a sustained period of time, so as to

ascertain if there are tangible and repeatable positive results in their use. Specific technologies, such as the use of tablet and laptop computers during class sessions, could be researched to see if there are the proposed improvements suggested by the research in this project.

It would be recommended that further qualitative research be carried out on the students in one-to-one interview or focus group meetings to get further details with greater probing to ascertain specifics on their requirements. *Most universities regularly undertake these group interviews as part of their quality auditing processes.*

It would also be recommended to gain further data from the lecturers themselves and their input into the discussion.

There is not however, one simple answer to the question of “How Can Technology Be Used To Motivate Learners In Higher Education?”: it is a very wide-ranging topic. Not only has it already been shown that the subject of motivation is a very large one, and whilst there is currently a wealth of research being undertaken in this area, more needs to be done. But also the area of technology to support learning is an equally vast one, with students from similar backgrounds, ages, genders and experiences all saying they would like to see different things.

The one thing that can be said is that, regardless of these personal characteristics, the modern learner, the net-native learner, expects to see and use any number of differing technological devices in their Higher Education and the traditional university does indeed need to be aware of and embracing this otherwise we could see the onslaught of MOOCs and other methods of online, flexible learning challenge the dominance of traditional ‘bricks and mortar’ establishments.

## 6 References

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## 7 Appendices

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*This chapter will include appendices for any additional information used during this report.*

### **Contents**

Student Survey Form .....	Appendix A
Free Response Answers 1 .....	Appendix B
Free Response Answers 2 .....	Appendix C



## Survey Into The Use Of Technology In Higher Education

*Please try to answer all questions as honestly as possible, no personal details will be given to any other bodies, and any identifying responses will be kept in the strictest of confidence. This is purely for my own Masters' Project.*

<b>Age Range:</b>	Under 20 <input type="checkbox"/>	20-24 <input type="checkbox"/>	25-34 <input type="checkbox"/>	35+ <input type="checkbox"/>	<b>Gender:</b>	Male <input type="checkbox"/>	Female <input type="checkbox"/>
<b>Your Home Life:</b>	Living with Parents <input type="checkbox"/>		Not Living with Parents <input type="checkbox"/>				
<b>How Would You Best Describe Your Socio-Economic Grouping?</b>							
Lower Class <input type="checkbox"/>	Working Class <input type="checkbox"/>	Middle Class <input type="checkbox"/>	Upper Class <input type="checkbox"/>				
<b>Level of Study:</b>	Foundation Year <input type="checkbox"/>		Degree <input type="checkbox"/>				
<b>Subject Area:</b>	Science & Engineering <input type="checkbox"/>	Travel & Tourism <input type="checkbox"/>	Legal <input type="checkbox"/>	Accounting <input type="checkbox"/>			
Management <input type="checkbox"/>	Health & Social Care <input type="checkbox"/>	Sales & Marketing <input type="checkbox"/>	I.T. <input type="checkbox"/>	Banking <input type="checkbox"/>			
<i>These next two questions can have multiple answers</i>							
<b>Where do you access the internet?</b>	Home <input type="checkbox"/>	University <input type="checkbox"/>	Mobile Phone <input type="checkbox"/>	None <input type="checkbox"/>			
<b>Which do you own?</b>	Desktop Computer <input type="checkbox"/>	Laptop <input type="checkbox"/>	Smartphone <input type="checkbox"/>	Tablet <input type="checkbox"/>			

**Please indicate your thoughts on the following statements.**

*\*By 'technology' I mean hardware and/or software/programs*

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
I regularly attend all classes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am good at using technology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I enjoy using technology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My teachers use technology in lessons	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My teachers use Moodle and keep it up to date	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I use online sources for my research and my studies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I use Moodle regularly to help with my studies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I use social networking media to help with my studies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I enjoy my classes more when technology is used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I feel more motivated to study when using technology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I feel I perform better in class when technology is used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I would like to see more use of technology in class	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*Continued briefly overleaf*



It would be incredibly helpful for me if you could give me some thoughts on the following free response questions too.

**What types of technology, if any, do you use for your studies? (these questions can have multiple answers)**

Desktop Computer <input type="checkbox"/>	Laptop/Netbook <input type="checkbox"/>	Smartphone <input type="checkbox"/>	Tablet <input type="checkbox"/>
CU Locate (Online Library) <input type="checkbox"/>	Moodle <input type="checkbox"/>	Google Scholar <input type="checkbox"/>	Wikipedia <input type="checkbox"/>
Facebook <input type="checkbox"/>	Twitter <input type="checkbox"/>	Google Search <input type="checkbox"/>	YouTube <input type="checkbox"/>
Microsoft: Word <input type="checkbox"/>	Microsoft: Excel <input type="checkbox"/>	Microsoft: PowerPoint <input type="checkbox"/>	Others <input type="checkbox"/>
If other (please give details):			

**Which, if any, areas would you like to see greater use of technology in your studies?**

**What technology, if any, could motivate you to work harder in both classroom and self-study?**

Thank you ever so much for taking the time to complete this survey 😊





## Which, if any, areas would you like to see greater use of technology in your studies?

*Please Note: These are written in the students' own words, and whilst attempts have been made to correct obvious spelling mistakes, the grammar used is a verbatim copy of the students' responses.*

Overall - More interactive Activities

Interactive

I don't want. I fear the day that technology will surpass our human interactions. The world will have a generation of idiots

Audio logs of the class to be put up on Moodle

Upstairs

Instead of class notes, video lessons or further reading on Moodle

Maths Side

During tutorials as it drags on and can be quite boring. Easier way to speak to tutors

In tutorial as we can get on with assignments having teachers on Facebook

Access to teacher on Facebook/social networking. Tutorials, presentations. Laptops in class to support studies

More in tutorial, may be a presentation to assist us on any work we need help on. Use of laptops in class to do assignments alongside. Have tutors on Facebook instant message

Classes

Class discussions - use SmartBoards

Maybe more videos

More interactive work on Moodle i.e. worksheets and online resources. More time using laptops/computers in class

Following up on lectures via voice recording

I would like to use more of desktop computers and YouTube in my studies

Interactive Lectures instead of notes

PowerPoint, Coding, Scripting

I would like to see the class using more tablets and laptops in class as they offer a lot more tools that can be helpful for your studies

When looking at PowerPoint use technology to show a practical demonstration

Watch more educational videos - Learn better with motion content

Student Attendance

Communication between students and teachers

During Lessons/Lectures

Use of different types of software

As this is an IT class I think the use of technology is appropriate and correct at this level

I would like to see more types of technology used in the classes from use of tablets to video conferencing for work purposes, i.e. Google Hangout

I would like to see greater use of technology in software development such as Dreamweaver, Visio etc. The more we use the better understanding and experience I shall have

Use a wider range of computers such as MACs and HPs to develop my skills and knowledge

Yes

Additional Programming

I'd like to see more appropriate software used for assignments in classroom environments

Being able to record or save teaching in class on some sort of device it help understand the work when out of lessons

I am happy with the use of technology as of now

No need for the use of greater technology

The current use of technology in my studies is enough to allow for information to be understood

I would like PowerPoint/excel to show certain statistics in class

When Searching/reading in class

More books should be ordered and put online
Computers - Moodle
Online Researching
We have a lot of access to most technology anyway
Moodle, CU Locate, Laptop
For activities during lectures - More computer or tablet based, more practical activities using the internet
I have sufficient use of technology in my opinion. Although video conferencing would be good.
I would like to see more online articles on Moodle to help with our studies. Google Scholar could have free articles
CU Locate
Video Conferencing
During lectures more computer/tablet based work
During Tutorials
Alright the way it is
Activities. Feedback
Use technology for greater feedback
Make Moodle into a smartphone App
Moodle
Moodle
Technology that records the lecturers extra notes that can go onto PowerPoint in case the slides are not clear
Lecture. Exercises
I think in Sales and Marketing we don't really need to have more use of technology
None, it's all pretty much up to date
Recording Lectures
Not really, I am satisfied with the use of technology in my studies
Words and PowerPoint, I understand using them more
Any media related studies
The studying during lectures
Publisher (Microsoft)
All of them
I would like to see greater use of technology during practical activities. I think this will help to engage everyone in the activity
More worksheets on Moodle to assist with studies due to exams
Videos and Practicals
Smartboard Software
More use of simulations
Better PowerPoint explanations
Certain Engineering Software
Possibly more learning electronically during classwork, using more interesting programs such as CAD, Excel etc
In lectures - Also for research
Those tablet devices
Classroom
More classes more interactive for students to encourage active learning
In automotive engineers, the reduce the consumption of natural resources
Research
Practical
Interactive whiteboards
Activities
Electrical engineering, at least half of the lessons should use technology

Online homework would be good
The areas of hands on study
Online lessons - video lessons
In study, more work in one place on the internet for easier access
When we do practical work I'd like there to be more technology used when we do experiments and stuff
Yes, I'd like to use greater use of technology because it makes study projects easier
None
Lectures, would like to have practical hands on use of technology
I would like to have more practical work in classes
During a standard lecture
Note taking
The use of laptops in class
Videos - Interactive videos
Laptops provided in lectures
Recordability of classes
Better application for learning
In engineering
During my studies I would prefer there to be recorded lectures available
Activities







## What technology, if any, could motivate you to work harder in both classroom and self-study?

*Please Note: These are written in the students' own words, and whilst attempts have been made to correct obvious spelling mistakes, the grammar used is a verbatim copy of the students' responses.*

Proper Lecture Rooms

Having a Tablet

E-books

Tablets

Desk stored laptops

Tablets

Videos/Short Clips helps me to understand better

Laptops in class rooms for assignments

Laptops in class

Laptops in class to support studies. Video Clips

Notebooks/Laptops for class use.

Laptops for students in lessons

Tablets and Laptops

Touch screens, interactivities (e.g. Skype)

Video help as it helps to gain knowledge and makes lectures more enjoyable

PowerPoint and a lot of videos

Laptop. YouTube. Google Search

Tablets and larger computer screens

Laptops

Laptops and tables are there are tools on there that are very helpful

SmartBoard

Modern Technology

Tablets being used by each student in the class

Physical things like robots that you can program. Building things maybe for Boolean algebra we could build logic circuits

The use of tablets

Maybe more advanced and modern computers in class not old computers. Or hands on/practical technology module

Perhaps a tablet, but I wouldn't say it was necessary

The use of tablets would motivate to work harder, because it could potentially increase that level of interaction to an increase in work rate

I would like to use technology that I haven't use often, such as Dreamweaver so I can expand my language which will help motivate me to do further research etc.

Already well motivated but a variety of different computers and software would help

Tablets

Besides appropriate software, the use of our own devices would serve the purpose of being more suitable for the user than the provided computers

A method to write my reports and essays anywhere and at any time

None really

An app for smartphones

3D

I would like to have more videos used in class based law classes

MacBook Laptop - Personal Tablet

Tablets and Interactive lessons

MAC Computers/tablets should be given (MacBook Laptops)

Am satisfied with the materials and resources provided / available
Tablets, PCs, Phones, CU
None at all but an iPad comes in handy
IT and PowerPoint
Tablet Technology would help increasingly being portable and lightweight and also for taking notes in classes and also to access resources via the web
More use of laptop in classrooms I feel would be better. I have the right amount of technology in self-study.
Laptops in class, and an online seminar with other classes could help. Video conferencing could also help.
Music. Use of Laptops to take notes in lesson
Using Moodle to keep in touch with lectures in real time. Emailing current assignments to lecturers to gain feedback. Temporarily blocking Facebook and twitter while doing any work.
iPads allowed to be used.
Laptops because things would get done easier. And also information is accessed easily. And you can carry it around with you,. Mobile phones to access information.
Holograms
Tablet. Laptop
I don't think technology motivates it just aids
Technology is more a tool to use and help aid study. Motivation comes from yourself and others
Moodle, I use it regularly and my lecturers use It all the time as well. I can say Moodle is widely used by both students and lecturers.
Moodle
A tablet maybe so we can take notes on that instead of pen and paper
Use of Tablets
No more technology would motivate me as for my studies my laptop is enough and there are enough tools available on the internet
Maybe an app for iPhone saves times on journeys to the library
Free iTunes
Being able to write and submit my assignment on a tablet i.e. iPad
Using MS Word & Researching on internet motivates me because it benefits my knowledge
Some technology could distract in self-study. However in classrooms laptops could be used for motivation of younger students (school age).
The latest technologies - Technology that will have in the future
Laptops
iPad, Tablet
Tablets
More use of computers during lessons
Laptops in lessons
Tablet
Tablet
More use of my iPad. I think everyone in education should have one
Online Tutorials
iMac - iPhone5
More interactive activities
Use of tablets or laptops in class
Fifa
Helpful websites/search engines specific to a subject
Tablets
Tablets
FIFA



Flying prototype airplanes - projects done by students - prototypes of all kinds e.g. cars, trains, trams
Personally I would be more motivated in doing real tasks rather than watching videos etc.
More use of engineering programs
Internet
MP3 player
MP3 player
Tablets (iPad) - Electrical equipment
Competitive learning applications
Different computer programs which could be useful in my chosen path
Don't think it matters, learning is just a wee bit easier when it's on the internet
More practical experiments
Using laptops or tablets
Technology doesn't motivate me, teachers do
Student access to engineering software
Tablets, Laptops, Circuits
If everyone were to use tablets then we could be paperless and notes will be better organised instead of just loose sheets everywhere
The use of a laptop with eliminate some paper work as more can be stored on a laptop than in a book
With gaming
MP3 Lectures
Access to institutions
Holograms
Tablets
Technology in engines
My Laptop