# Administrators in Academia: Utilising ICT to adapt and develop support staff roles

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A dissertation submitted to the University of Dublin
in partial fulfilment of the requirements for the degree of
MSc in Management of Information Systems

***2nd September 2013***

## Declaration

I declare that the work described in this dissertation is, except where otherwise stated, entirely my own work, and has not been submitted as an exercise for a degree at this or any other university. I further declare that this research has been carried out in full compliance with the ethical research requirements of the School of Computer Science and Statistics.

Signed: _____

Judith Lee

2 September 2013

## Permission to lend and/or copy

I agree that the School of Computer Science and Statistics, Trinity College may lend or copy this dissertation upon request.

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2nd September 2013

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Finally, I would like to thank my family and golden circle of friends for providing constant vital advice and encouragement when most needed.

**Abstract**

Administrative staff are an important component of the team structure in third level institutions, providing continuous support to the complex organisation that is a University. This study researched if staff working in administration in TCD adapted well when faced with potential changes in information systems during a recession but with increasing growth within the third level sector, in order to reach their full potential.

A review of the literature of technology acceptance decided the best model for this research. The research framework was based on the unified theory of acceptance and use of technology (UTAUT). A pragmatic methodology was adopted for this research as this philosophy is determined and driven by the research question. The short timeframe dictated the choice of a deductive approach. Quantitative and qualitative primary data was gathered via an online survey.

Findings describe an administrative workforce where the majority had intermediate or advanced knowledge of IT; aged between 30 and 49 years; educated to primary or higher degree level; working in teams of three or more and using PCs 3 years or older. The gender ratio was 5:1 women to men.

The majority agreed that ICT enabled them to accomplish tasks more quickly and was useful in their jobs and that updating IS skills contributed to the development of professional careers within College.

High take-up rates of IS training courses and HR programmes emphasised staff self-motivation to learn or update ICT skills or for personal development. Reflective commentary suggested organisational innovations to improve job efficiency, productivity and satisfaction which have implications for future management practice.

Using this study as a basis, further longitudinal research could extend knowledge of technology acceptance and usage as part of workplace ICT learning and staff development for the benefit of individuals and the University organisation.

# Table of Contents

## List of Tables and Figures

## Abbreviations

| | |
|---|---|
| CMIS | Central Management Information System |
| CPD | Continuous Professional Development |
| EU | European Union |
| FIS | Trinity College Dublin Financial Information System Project |
| GeneSIS | Trinity College Dublin Student Information System |
| ICT | Information and Communications Technology |
| IDT | Innovation Diffusion Theory |
| IS | Information Systems |
| ISS | Trinity College Dublin Information Systems Services |
| MPCU | Model of Personal Computer Utilization |
| PEOU | Perceived Ease of Use |
| PMDS | Performance Management Development Scheme |
| PU | Perceived Usefulness |
| RPAMS | Research Proposal & Award management system |
| SCT | Social Cognitive Theory |
| SITS | GeneSIS – Student Information System |
| SPSS | Statistical Product and Service Solutions |
| START | Supports in Trinity Administration Review and Transformation |
| TA | Technology Acceptance |
| TAM | Technology Acceptance Model |
| TCD | Trinity College Dublin |
| TPB | Theory of Planned Behavior |
| TRA | Theory of Reasoned Action |
| TRAM | Theory of Technology Readiness and Acceptance Model |
| TRI | Technology Readiness Index |
| UTAUT | Unified Theory and Use of Technology |
| UTAUT2 | Extended Theory and Use of Technology |

# Chapter 1: Introduction

*"It is now regarded as axiomatic that the knowledge contained within an organization is one of its most precious resources"*
*(Ward and Peppard 2002, p. 504)*

Ward and Peppard (2002) explored strategies for management of information and focused on the idea that institutional knowledge needed to be carefully managed using practices of (IAM) information asset management.

Staff working in administration in third level institutions are vital to the team structure, providing continuous non-academic support to the complex organisation that is a University. This study wished to research if staff working in administration in Trinity College adapt well when faced with potential changes in Information systems in a period of recovery from recession and increasing growth within the third level sector, in order to reach their full potential.
This study was to carry out research on technology acceptance in an academic setting with the third important and constant component of the university population, the administrative support staff.

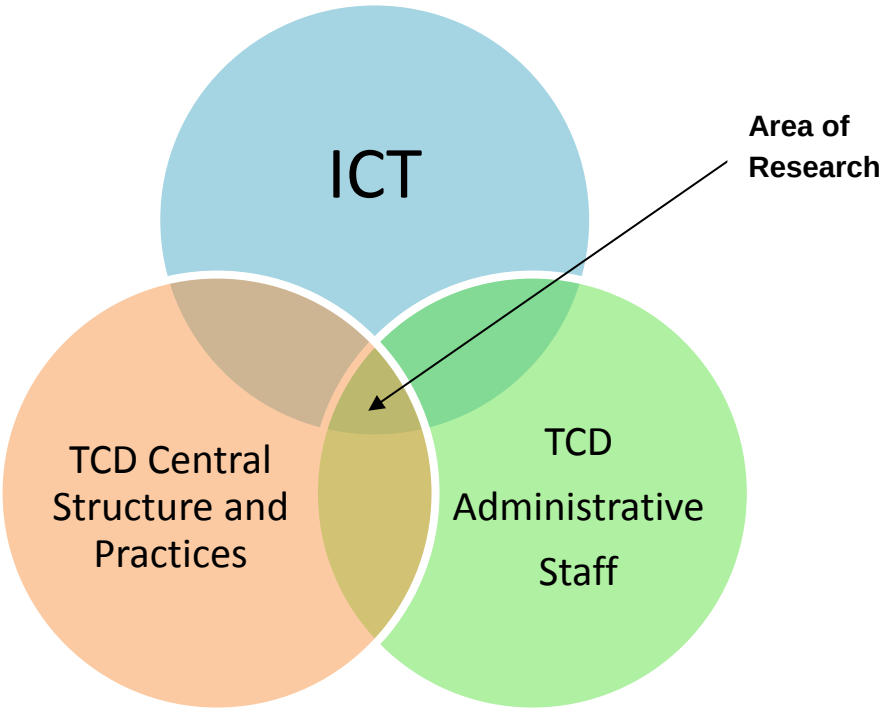


**Figure 1.1 Diagram of Research Area of Interest**

### *1.1 Facts and Figures*

The setting for this research is in Trinity College Dublin which is Ireland's oldest university. The University of Dublin, Trinity College was founded in 1592 by a charter obtained by Dublin citizens from Queen Elizabeth I to establish a University on the site of the former monastery of All Hallows outside the walls of the city of Dublin. The city quickly expanded beyond the original medieval boundaries and the College is now situated in a campus consisting of 51 acres in the centre of the historical, political and commercial hub of the capital of Ireland (Trinity College 2013).

Trinity College Dublin is recognised internationally as Ireland's premier university and was ranked in 67th position in the top 100 world universities by the QS World University Rankings 2012 (Trinity College 2013).

The Library in Trinity is the largest research library in Ireland and is a legal deposit library for Ireland and Great Britain which legally entitles Trinity to receive a copy of every book published in both jurisdictions. TCD library contains five million books and has significant collections of manuscripts, maps and printed music. The most famous manuscript in the library collection is the Book of Kells which is housed in the Old Library (Trinity College 2013).

TCD is one of the world's leading research intensive universities and has a strategic focus on the research areas of European & International Integration, Culture & Creative Arts, Materials & Intelligent Systems,Biosciences & Translational Research and Transport, Energy & Environment. Trinity supports a wide range of research institutes; Trinity led research consortia & inter-institutional research groups and Research Centres (Trinity College 2013).

In 2012 the registered student population was approximately 17,000 of which 71% were undergraduate students and 29% were postgraduate students. 87% of the students were registered as full-time (Trinity College 2013).

Trinity College Dublin employs a total number of 2,936 staff, of which 785 are academic staff, 1,496 are library, technical, administrative, and support services staff, and 655 are research staff. The College Calendar (2012-2013) lists 320 administrative staff in the Senior Executive Officer and Executive Officer grades (Trinity College 2013).

### *1.2 Research Question*

The title of this study is 'Administrators in Academia: Utilising ICT to adapt and develop support staff roles'.

The main queries discussed in the research include the following.

The range of IS systems used by administrators throughout the organisation.

How administrators prepare or train for potential new IS systems to replace established IS systems.

Do IS training and workshops offer support and assistance to administrators to accept, adapt and use ICT applications?

If increased knowledge of IS systems and ICT applications prove useful in the workplace and contribute to job satisfaction?

Apart from mandatory training for new workplace ICT applications, if administrators opted for further training in the area of Information Systems.

The incentives which drive administrators to seek further training/education in IS systems.

Do administrators, motivated to increase IS knowledge to further career prospects, feel supported to achieve this goal by their department / administration area and College in general?

Are administrators aware of the EU strategy policy of Continuous Profession Development and the promotion of CPD for administrators within Trinity?

### *1.3 Importance of this Research*

This research hopes to gain a greater insight into the range of knowledge and utilisation of IS systems among non-academic staff working in administration in a University, their motivation to accept and adapt to future ICT applications to complete their work and to judge if training / further education is linked to career prospects and Continuous Professional Development.

This study tested Technology Acceptance Models in a real life situation on a workforce coping with working in a vibrant academic environment. This environment was undergoing strategic reorganisation to existing systems and introduction of new

information systems as part of a five year strategic plan to reform structures and practices to position TCD as a globally competitive university - Trinity College Dublin Strategic Plan 2009—2014. This reorganization included the introduction of a new Financial Information System Project (FIS), a new student information system (GeneSIS project) and a programme to harmonise administrative and academic units (START – Supports in Trinity Administrative Review and Transformation).

Simple questions were addressed directly to the staff working in administration to gain insight to views on IS systems, the effect of ICT in the workplace and how they prepared to meet any important changes such as those of the Strategic Plan which would mean alterations to IS systems in their daily operations.

### *1.4 Beneficiaries of this Research*

This research will be of interest to the management of central administration in Trinity College and to other academic institutions. In particular it will be of interest to those departments which are involved with the work of non-academic support staff such as Information Systems Services, Human Resources, Central Academic Administration Services (CAAS) and the Office of the Vice-Provost.

Information supplied in response to the survey in this study could act as a guide for future recruitment, training and career development of this staff sector.

This research will also interest the staff who work in administration as the results reflect the wide and varied skill set and potential of this group and allowed them a forum to express opinions on ICT and information systems.

### *1.5 Scope and Boundaries of this Study*

The study focused on the non-academic staff working in administration in Trinity College Dublin aged between 18 and 65 years. The School of Computer Science and Statistics Research Ethics Committee the research ethical form required confirmation that the research 'Verify that participants are 18 years or older and competent to supply consent.' (Appendix A). The first declaration on the Informed Consent form addressed to potential participants in the survey was the confirmation `that the participant was '18 years or older and am competent to provide consent.' (Appendix C).

Administrative staff must retire on the 30th of September after their 65th birthday (Trinity College 2013).

Academic staff were excluded from this research as the support; training and career path of these members of staff differs fundamentally from the majority of non-academic Administrative staff.

### *1.6 Route map of Dissertation*

The structure of this dissertation is divided into the following chapters.

Chapter 1: Introduction – This chapter outlines the context, rationale and background information to the research question. It concludes with a statement of why and to whom this research is of importance.

Chapter 2: Literature Review – This chapter reviews Information Technology acceptance research; the progress, development and comparison of Technology Acceptance models (TAM). TAM is also placed in context with current workplace learning initiatives to promote lifelong learning and Continuous Professional Development (CPD). This literature review chapter directly guides the research of this dissertation.

Chapter 3: Methodology and Fieldwork – This chapter explores the methodologies considered for this research and the methodology chosen justified. Details are given of how the research was carried out, how the survey was delivered, accessed and analysed. Problems with ethical authorisation and conflict of interest issues regarding the target survey population are discussed.

Chapter 4: Findings and Analysis – This chapter states the findings of the research and analyses and reflects on these findings.

Chapter 5: Conclusions and Future Work – This chapter will show if the research has answered the research query, found any new or interesting results, proved or advanced the knowledge of technology acceptance and indicate any possible future research in the area studied.

# Chapter 2: Literature Review

## 2.1 Introduction

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Administrators and end users of information systems are a vital link in the success of any organisation. Resistance, inertia or slow take-up of any new ICT applications by end users can have a serious impact on the day to day running of the organisation. Researching what role gender, age, past experience and training play in the acceptance and usage of new ICTs or ICT applications within organisations has influenced the development of a number of theories and models which have directly formed current practices in the management of information systems.

## 2.2 Origins and development of Technology Acceptance Theories

Work in Technology Acceptance is now viewed as one of the most mature areas of information systems research (Venkatesh et al. 2012). Theories and models which research information technology acceptance were developed to find strategies to encourage acceptance and remove resistance to new applications or IT work practices.

The drive behind Technology Acceptance was to try to understand what motivates some users to readily adapt to new systems and why other users are fearful of change even with the knowledge that use of the new technology will bring improvement (Polites and Karahanna 2012).

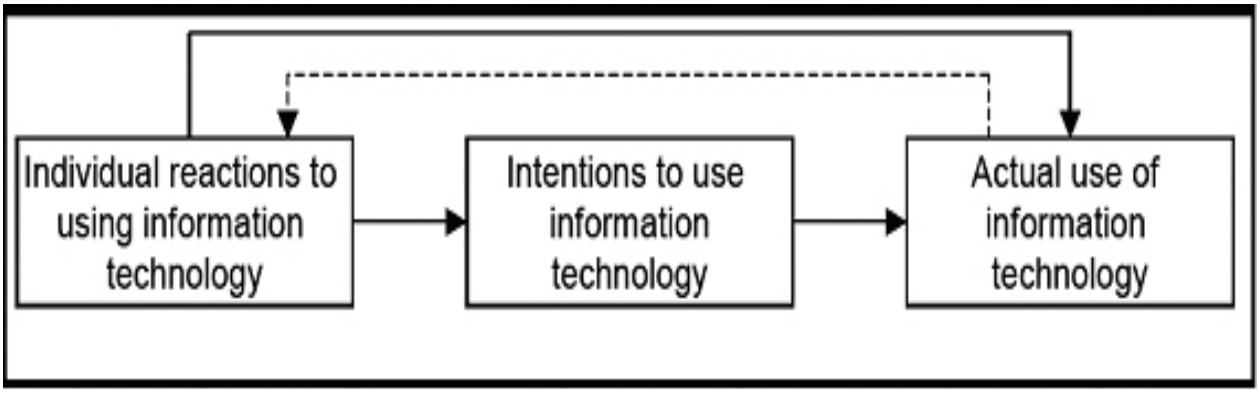



**Figure 2.1 Basic Concept Underlying User Acceptance Models**

Early IS researchers looked to models in the disciplines of sociology and psychology with which to design suitable models to guide management of information systems (Venkatesh et al. 2003)

Some models came about as a result of an adaptation of a previous model to apply to the ICT world. The social scientist Everett Rogers developed his Innovation Diffusion theory (IDT) from a previous agricultural-sociological theory from the 1950s applied to use in U.S. agriculture. Rogers sought to adapt the original theory and apply the model to the area of public health and other fields to study all types of innovations (Rogers 1962).
Rogers produced five editions of his diffusion book from 1962 to 2003 and each edition honed the theory to decade of its publication. The wonderful adoption curve in the graph above illustrates the five adopter categories cited by Rogers. The Elements of the Theory are Innovation, Communication, Time and Social System. Age, social status and education are factors which influence categorisation as well as willingness to accept new innovations.

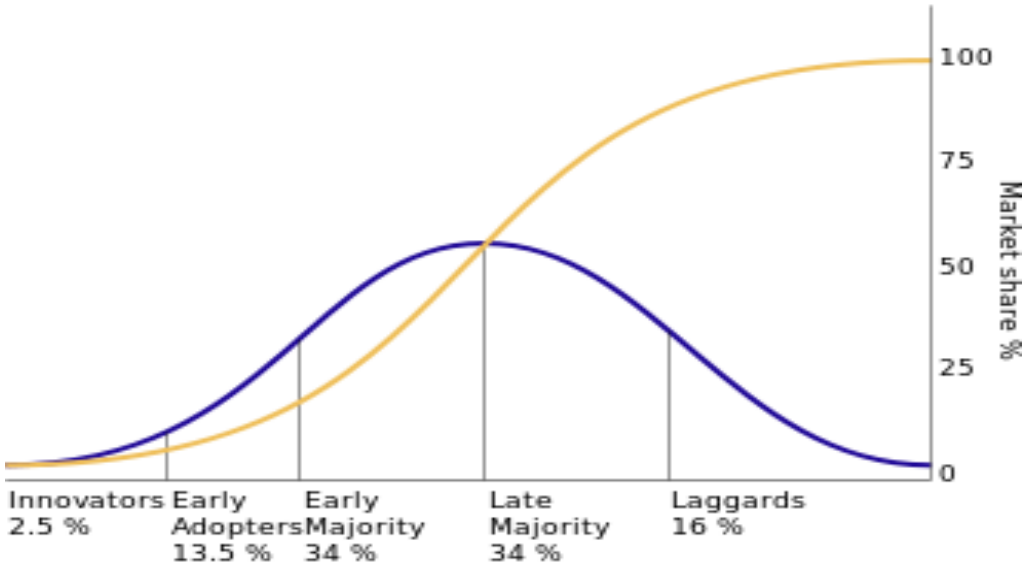



**Figure 2.2 Innovation Diffusion Adoption Curve**

*"An innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption",* (Rogers, E M. 2002, p. 990)

The Theory of Reasoned Behavior (TRB) had its origins in the area of social psychology and in a review of empirical research Ajzen and Fishbein (1977) studied reactions of students to a wide spectrum of topics ranged from studying attitudes to Religion, Race and cheating among students. Fishbein and Ajzen wished to predict intention to behave and devised a formula or equation which combined attitude and influences which affect the behaviour or intention to behave. Fishbein and Ajzen came to a pessimistic and cautious conclusion regarding the subjective influence of researchers on attitude measurement but acknowledged the concept of attitude 'as the cornerstone in the edifice of social psychology' (Fishbein & Ajzen 1977, p. 914).

Ajzen (1991) extended TRB by including the construct of Perceived Behavioral Control which is an additional influence on intension and behavior. An interesting area of discussion was the role of past behavior which Ajzen stated highlighted an important oversight of the theory whereby he proposed the significance of the residual effect of past behavior on later behavior and the influence of habit on acceptance (Ajzen 1991).

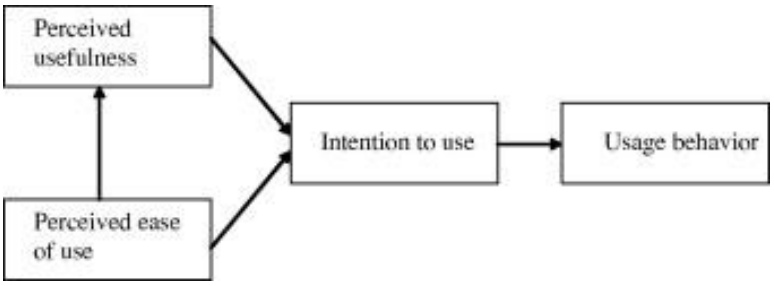



**Figure 2.3 Technology Acceptance Model, Davis (1989).**

Davis (1989) focused specifically on IT usage and as a result adapted ideas from the Theory of Reasoned Action into his own Technology Acceptance Model. The Theory of Reasons Action originated in the area of social psychology and devised by Fishbein and Ajzen (1975) stated that a person's behavior is determined by the person's attitude and subjective norms towards that behavior. Davis viewed TRA as too general to apply to research on attitudes to technology.

"*Valid measurement scales for predicting user acceptance of computers are in short supply. Most subjective measures used in practice are unvalidated, and their relationship to system usage is unknown." (Davis 1989, p. 319)*

Davis' introduction of Perceived Usefulness (PU) "or the concept of the degree to which a user believes use of a system will improve his job performance" and Perceived Ease of Use (PEOU) "or the degree to which a user believes utilization of a system will be free from effort" as concepts 'of primary relevance for computer acceptance behaviours' (Davis, Bagozzi and Warshaw 1989, p. 983). TAM has been one of the most influential models for research of ICT systems and applications in the past three decades.

Venkatesh and Davis (2000) examined an extension to the Technology Acceptance Model (TAM2) in four longitudinal field studies. They referred to the strong support in favour for the theory proposed by Davis (1989) and Davis et al.(1989) and noted that in the decade following the publication of these papers TAM had become well established with the duel constructs of perceived usefulness and perceived ease of use. TAM2 included the key determinants of perceived usefulness and examined how over time increased user experience changed the effects of such determinants (Venkatesh and Davis 2000). This version of the Technology Acceptance Model included social influence processes (subjective norm, voluntariness and image) and cognitive instrumental processes (job relevance, output quality, result demonstrability and perceived ease of use) viewed as significantly influential factors on user acceptance (Venkatesh and Davis 2000)

Venkatesh and Bala (2008) provided a further extension of TAM which included the determinations of perceived usefulness and the determinants of perceived ease of use. One of the many interesting results showed a lack of 'crossover effects' that the determinants of perceived usefulness did not influence perceived ease of use and the determinants of perceived ease of use did not influence perceived usefulness (Venkatesh and Bala 2008).

Social Cognitive Theory (SCT), a powerful social theory of human behavior was in 1995 adapted and developed by Compeau and Higgins into a model to test computer self-efficacy (belief that one could succeed in carrying out a task), outcome expectation and computer usage anxiety. Compeau, Higgins & Huff (1999) conducted a longitudinal study using SCT and individual reactions to IS technology and a methodology used to test demographic variables, a link was found between performance outcomes and affects on user anxiety and IT system usage. SCT was used to judge performance and system usage and differed from TRA and TAM models that focused on user attitude to technology.

The Technology Readiness Index (TRI) was developed by Professor A Parasuraman sponsored by commercial interest to refine a multi-item scale to measure a user's readiness to embrace new technologies. A National Technology Readiness Survey was completed and the condensed scale of the survey had items divided into four categories or subscales: optimism, innovativeness, discomfort and insecurity. Parasuraman stated that optimism and innovativeness were the drivers of technology readiness and that discomfort and insecurity were the inhibitors of same. He believed that these categories were good indicators of technology-related behaviour (Parasuraman 2000)

Parasuraman concluded that the TRI was of use to assess the readiness of 'contact' employees who deal with the public. Parasuraman was of the opinion that employees who had high rates of "both interpersonal skills and technology readiness were more effective in tech-support roles" (Parasuraman A. 2000, p. 318). He suggested that TRI could be used as a personnel screening system (Parasuraman A. 2000).

Lin, Shih and Sher (2007) sought to integrate technology readiness into the Technology Acceptance model when researching e-service system adoption by consumers which they named TRAM (Theory of Technology Readiness and Acceptance Model). They referred to TAM as "specific for a particular system" or 'system-specific' and TR "for general technology beliefs" or 'individual-specific' (Lin, Shih and Sher 2007, p. 644).

Lam, Chiang and Parasuraman (2008) expanded these concepts by carrying out in an empirical study on internet activities by using dimensions of TRI to look at the effect on technology acceptance, adoption and usage of different internet activities using U.S. consumer survey data. Results from this study furthered the idea of technology modelling with implications for IT management and proved that optimism had a significant positive effect and insecurity had a significant negative effect on internet usage (Lam, Chiang and Parasuraman 2008).

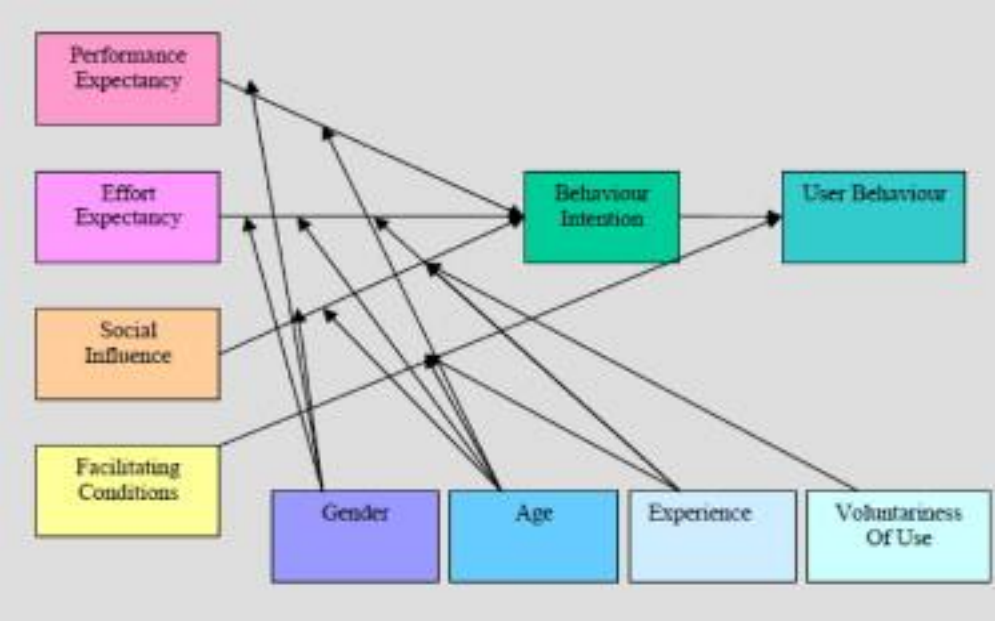



**Figure 2.4 Unified Theory of Acceptance and Use of Technology**

Venkatesh, Morris, Davis and Davis (2003) sought to explain the 'drivers of excellence' by a review and comparison of eight models or theories of technology which resulted in The Unified Theory of Acceptance and Use of Technology. The models and theories of acceptance were the Theory of Reasoned Action; Technology Acceptance Model; Motivational Model; Theory of Planned Behavior; Combined TAM-TPB; Model of PC Utilization; Innovation Diffusion Theory and Social Cognitive Theory.

Significant constructs in UTAUT perceived as having a role in user acceptance and usage behavior were performance expectancy; effort expectancy, social influence and facilitating conditions. The theory also cited the important role of the moderators of gender; age; voluntariness and experience.

Venkatesh, Thong and Xu (2012) extended UTAUT to explain acceptance and use of information technology in a consumer context. UTAUT 2 now included habit, hedonistic motivation and price value as constructs. Age, gender and experience were moderating factors. Voluntariness was no longer considered as a factor. Results of the research showed the importance of habit as a "perceptual construct that reflects the results of prior experiences" (Venkatesh, Thong and Xu 2012, p. 161).

*"The strength and activation of habit differs across age, gender and experience"*
(Venkatesh, Thong and Xu 2012, p. 174)

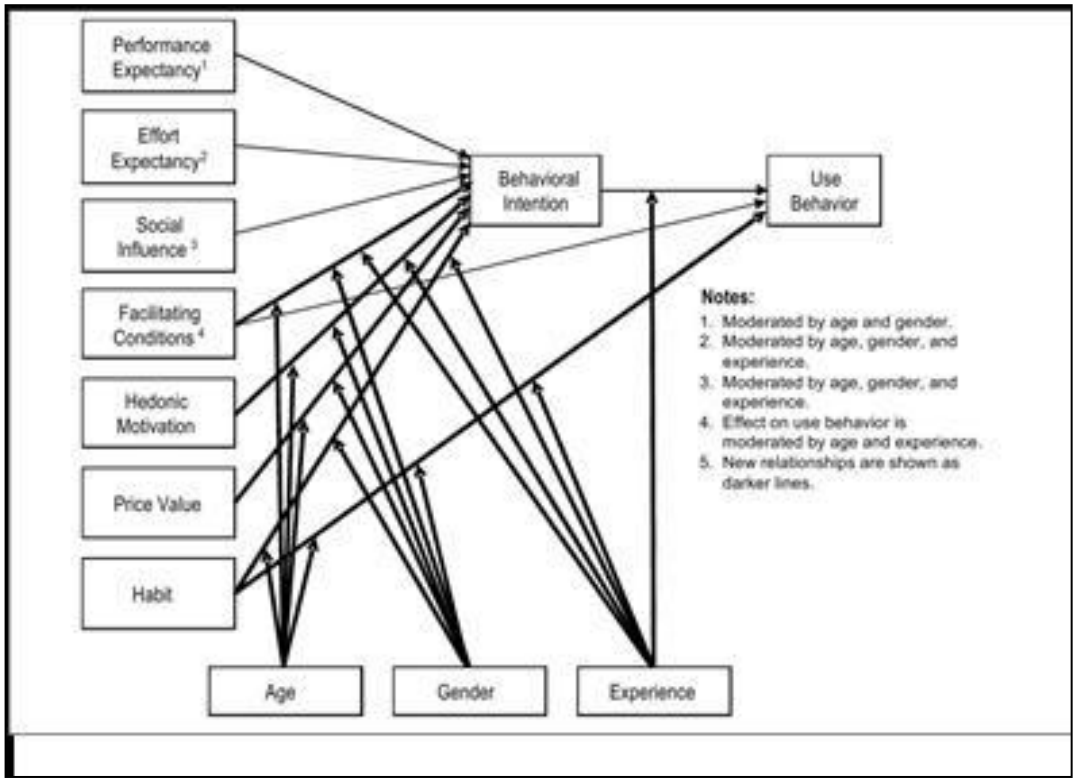



**Figure 2.5 UTAUT 2 Model**

## 2.3 Technology Acceptance in Practice and implications for the workplace

R M Grant (1996) views that the knowledge within a firm is not 'organisational knowledge' but puts emphasis on the role of individuals to learn, create and store knowledge as part of a complex hierarchical structure (Grant 1996, p. 117).

Venkatesh and Morris (2000) studied 342 workers over a five month period during the introduction of a new IS system. The longitudinal study using TAM and the real organisational context (five companies were studied). Social context and gender constructs were viewed and the findings were that women were motivated by process (perceived ease of use) while men were driven by instrumental factors (perceived usefulness) (Venkatesh and Davis 2000).

Walczuch, Lemmink and Streukens (2007) researched the Technology Readiness Index by testing intention to use new technology with among employees in multi-site financial service provider in Belgium. The large sample of 800 responses gathered findings which

acknowledged the effects of optimism, innovativeness, insecurity and discomfort to the perception of technology. The researchers concluded that lessons could be learned by managers regarding the personality types of their workforce. One conclusion made by this research was that highly innovative workers might be encouraged to champion new IS systems. Another conclusion was that highly insecure workers could be encouraged to help design a security system to defend against security leaks (Walczuch, Lemmink and Streukens 2007).

Morris, Venkatesh and Ackerman (2005) compared the effects of gender and age differences on decisions by employees concerning new technology. The model used in this research was the Theory of Planned Behavior with a view to extending its function. Interesting findings pointed to the unisex nature of the attitude of younger workers to new technology which the researchers proposed was due to increased exposure to technology of the younger generation of all gender.

Brannick and Coughlan (2007) championed 'Insider Academic Research' which they defined as 'research by complete members of organisational systems in and on their own organisation' and found was justified and of value. (Brannick and Coughlan. 2007, p59) The study found a case for insider research on the grounds of access to the organisation and 'preunderstanding' of structures and processes. The organisational and researcher duality of roles was discussed. The recognition of management of organisational politics was a topic for thought and relevance. No matter what research philosophy tradition was used to research organisations Brannick and Coghlan concluded that insider research was valid, useful and could provide important information as to how organisations really are (Brannick and Coughlan 2007).

Benbasat and Barki (2007) wrote that TAM had been so influential that its success had diverted researchers away from investigating how useful IS systems really were. They argued 'that TAM has fulfilled its original purpose', that the theory did not direct design and practice and that the focus on 'TAM' by researchers rather use of TAM to study other factors which affect IT adoption and acceptance. (Benbasat and Barki 2007, p. 216) They imply that the result is the reinforcement of knowledge of TAM but the knowledge of what makes IT useful is not increased. They suggest that in order to provide advice on future action, researchers should focus on a theory of usefulness combined with a return to IT implementation and design to discover what makes a useful IS system. Among the various proposals made by Benbasat and Barki was the need to measure usefulness

beyond perception, whereby an IT system 'was only perceived as useful but objectively shown to be useful' (Benbasat and Barki 2007, p. 216).

Straub and Burton-Jones (2007), in reaction to Benbasat and Barki, agreed with some of the findings in 'Quo Vadis TAM' such as the revaluation of the constructs of perceived usefulness and IS system usage. They suggested that the problem with as TAM research evolved the constructs of the model increased to extend to 10 in UTAUT. Straub and Burton-Jones introduced the notion of parsimony as "a high priority in the IS field". (Straub and Burton-Jones 2007, p. 227) Parsimony is the adoption of the simplest assumption in the formulation of a theory or in the interpretation of data. Straub and Burton-Jones state that the future of TAM lies with the adoption of "a parsimonious model of technology acceptance". (Straub and Burton-Jones 2007, p. 227).

Beaudry and Pinsonneault (2010) studied the direct and indirect effects on emotions on user acceptance of new technology on bank account managers in two different banks before, during and post implementation. The impact of a new IT system on performance was a sensitive issue as a large portion of salaries of the respondents was dependent on commission earned. A new IT system was viewed as affecting earning power, existing work habits and performance. The findings made some useful suggestions on how managers could provide support for users to deal with negative and anxious emotions and encourage specific positive emotions to promote new ICT applications (Beaudry and Pinsonneault 2010).

Polites and Karahanna (2012) studied Inhibition and Inertia and their effects on incumbent systems and new system acceptance as part of research to extend the TAM model. More than 600 students in 8 different MIS courses at a University in the US were surveyed about the use of file sharing in group projects of which 334 responded with their reactions to switching from the incumbent email system to sharing group files using Google Docs. Polites and Karahanna's findings supported the hypothesis that inertia leads to decreased perception of the ease of use and to the relative advantages of a new system and that inertia has a negative impact on the intension to use a new system. They made practical suggestions with which to reduce inertia and dissuade habit formation by encouraging habit disruptions and changing users' perception of the costs of switching to new systems (Polites and Karahanna 2012).

## 2.4 Life Long Learning and Continuous Professional Development (CPD)

*"Overall, there is need for reliable, timely data on the whole adult learning sector to allow an informed assessment of its strengths and weaknesses, as well as to ensure that policy is evidence-based and addresses the needs of learners, providers, employers and other key stakeholders. Relevant evidence could also help to promote equitable access to and participation in adult education and training."*

(Country Report on the Action Plan on Adult Learning: Ireland, on behalf of the European Commission 2011, p. 21)

The Country Report on the Action Plan on Adult Learning: Ireland (2011) was carried out on behalf of the European Commission as part of a European wide review of 30 member countries in the Adult Learning Action Plan working group. The report included strategies to deal with the effect on the workforce of recession and how to train or retrain adults to increase their employment opportunities. The National Skills Strategy (2007) wished to 'concentrate on developing the skills base of the labour force' by at strategy to encourage adults to increase their level of education by one level on the National Framework of Qualifications. Ireland reported on the recommendations of the Taskforce on Lifelong Learning which included a 'greater attention to ICT and e-learning' (European Commission 2011, p. 8). The report found that many educational institutions catered for full-time students and acknowledged the challenges of upgrading the ICT skills of the adult population.

A Digital Agenda for Europe (2010) published by the European Commission found that "Europe was suffering from a growing professional ICT skills shortage and a digital literacy deficit" (A Digital Agenda for Europe 2010, p. 6). The report suggested that potentially strong ICT skills could help Europe address "acute societal challenges" (A Digital Agenda for Europe 2010, p. 6). The EU Commission confirmed its support for national and European awareness raising activities in order to promote ICT skills and to encourage digital literacy and ICT training for the workforce (A Digital Agenda for Europe 2010).

Sadler-Smith, Allinson and Hayes (2000) addressed Continuous Professional Development learning preferences and cognitive styles. CPD methods such as work based teams; courses/seminars/conferences and self-directed or informal learning (using technology based training approaches) were discussed. The idea of self-direction or learner autonomy was studied and the researchers suggested that learning preferences

might "vary as a function of the innate characteristic of cognitive style (Sadler-Smith, Allinson and Hayes 2000, p. 240). They concluded that "Learner motivation is an essential pre-condition for effective learning "(Sadler-Smith, Allinson and Hayes 2000, p. 253).

Kanuaka and Nocente (2003) continued this theme of style and personality on learning with an exploration of the effects of personality types and satisfaction with web-based learning. The benefits were explored of using web-based learning methods as an alternative method to traditional learning methods such as classroom based seminars. The findings of the survey showed that the levels of satisfaction for all personality types and genders were not affected by taking web-based delivery of training / courses.

Ryan (2003) conducted a survey of among medical professionals as to motivational factors to participate in continuous professional development. The findings of the survey were that the motive to 'update professional knowledge / skills' scored the highest and the motive with the lowest score was 'to achieve a higher educational qualification due to an unsatisfactory education' (Ryan 2003, p. 504). Ryan concluded that individual goals affect the type of CPD selected and that motivation for CPD is driven by external and internal factors.

## 2.5 Conclusion

This chapter reviewed literature on the origins of technology acceptance theories and practical research applications using various models. The chapter also reviewed literature on management of information systems; lifelong learning and continuous professional development. Technology acceptance models which evolved from adaptations of Technology Acceptance Model (TAM) and the Technology Readiness Index (TRI) such as The Unified Theory of Acceptance and Use of Technology (UTAUT) have been shown to be most useful in the study of real world scenarios.

# Chapter 3: Methodology and Fieldwork

## 3.1 Introduction

*"What is required is that researchers understand the implications of their research perspective, and act in ways that reflect that knowledge".*

(Orlikowski & Baroudi 1991, p. 24)

This chapter discusses the research methodological philosophises which were considered for this study and the justification for the philosophy chosen. The strategy approaches and methods which were used to obtain research results are detailed. A description of the type of data collected in this study and details of the source of data is given.

## 3.2 Methodological philosophies considered

The major schools of research philosophy were considered when choosing the methodological philosophy which would drive the design of this research. The fundamental goal of this research was concerned with enhancing knowledge of the technology acceptance among university administrators who use information systems.

Orlikowski and Baroudi (1991)examined 155 information research articles published over a five year period in the mid-1980s and found that there was a common set of philosophical assumptions taken by IS researchers which they judged as "unnecessarily restrictive" as a sole research perspective with which to base information systems studies. In the majority of all 155 research papers examined, the epistemology or the considered acceptable knowledge came down on the side of Positivist philosophy. They suggested that researchers look to other philosophical approaches as such research would be enhanced by a "plurality of research perspectives... to investigate information systems phenomena" (Orlikowski & Baroudi 1991, p. 1).

The philosophy of Positivism was considered strongly for this research as the research question was most likely to produce quantifiable results which could lend to statistical analysis. The scientific approach of positivism which would prove any results of the research according to the Technology Acceptance Model was viewed as a major strength of this philosophy. The limitations of this philosophy were that some evidence of personal

opinions and comments were requested of the participants which could not be analysed in a scientific way and that a researcher was not independent of the data or the survey population (Saunders, Lewis and Thornhill 2012).

The philosophy of Interpretivism was also considered as a potential philosophy for this study as it emphasises the social role of people in business and management situations. Research would allow a subjective interpretation of any research results which are dependent on specific circumstantial situations (Saunders, Lewis and Thornhill 2012). Interpretivism acknowledges the complex situations of the business world and in this instance would be of use when studying the complex world of a third level institution.

Jürgen Sandberg (2000) argued that using an interpretive approach in research found that 'competence at work' was the meaning given to work from workers' experience of work rather than 'competence at work' judged in rationalistic terms as a 'specific set of attributes' such as the skills and knowledge to perform a certain task.

*"Do any real differences exist, therefore, between positivism and interpretivism? I believe the differences lie more in the choice of research methods rather than any substantive differences at a metatheoretical level." (Weber 2004, p xii)*

Weber (2004) called on colleagues to respond and engage to support or refute his argument that the rhetoric of Positivism versus Interpretivism was defunct. He analysed both philosophies by comparison of their metatheoretical assumptions (ontology; epistemology; research object; research method; truth; validity and reliability). He stated that theorists should be aware of the deep similarities rather than deep differences between these philosophies. Weber concluded that researchers are reflective and that "excellent researchers simply choose a research method that fits their purposes" (Weber 2004, p. xi).

The philosophy of realism was not considered suited to this research as although realism has a similar scientific approach as positivism; it is an objective philosophy in which reality believed to be independent from human thought and beliefs.

However, the consideration of the methodological philosophies in relation to this research was driven by constraints such as the timeframe of the Master's programme; ethical problems of the chosen area of research and the conflict of interest issue.

## 3.3 Methodology used in this research

*"As a philosophy pragmatism concentrates on asking the right questions and getting empirical answers to those questions".* (Baskerville and Myers 2004, p. 331)

The philosophy of pragmatism was adopted in this research for the reason that the most important driving motive of this philosophy is the research question. Pragmatism recognises that there are many ways to interpret information and thus employs the use of mixed or multiple methods to interpret results.

## 3.4 Justification of chosen methodology

The role of values or axiology for the interpretation of research results is of importance in pragmatism for the analysis of results in this research because participants would be questioned on matters of personal value such as career development using ICT skills.

In pragmatic philosophy the epistemology, which is the researcher's view of acceptable knowledge, is provided by both observable phenomena and subjective meanings and a practical approach to interpreting data.

As the research question was seeking to test a theory of technology acceptance and expecting to receive quantitative and qualitative responses in a short time frame a deductive approach was selected as the most suitable approach to this research. An inductive approach would be more suitable for a longitudinal study in order to build a theory perhaps for Doctoral research.

The five stages of deduction to test a theory (deducing a hypothesis; operationally expressing the hypothesis; testing the hypothesis; examining the specific results of the enquiry and modifying the theory as required) was important in preparing a research strategy in a scientific principled way.

## 3.5 Method used to conduct research in this study

A survey was the research strategy which was chosen as the most effective method of collecting data in the limited timeframe of the academic structure.

RESEARCH SETTING

The research setting was in Trinity College Dublin among non-academic staff working in administration with information systems. This setting was chosen as the research topic was to be in an area which was familiar and was seen as a potentially unexplored source of information to test the theory of technology acceptance.

Two ethical issues were raised in proposing this research and needed careful consideration before the research proposal would be accepted by the Ethics committee of the School of Computer Science.

The first ethical issue was the conflict of interest of the researcher and the population of the potential research. Research was to be carried out among work colleagues and staff of the same educational institution where the Master's programme was taught. TCD was both an area of study and an area of work for the principal investigator of the research. Brannick and Coghlan (2007) argued the merits of insider academic research which challenged the established view that research is 'best conducted by outsiders' as it was held that insider research did not abide by the 'standards of intellectual rigor' and was limited by subjectivity and 'emotional investment' in the research area (Brannick & Coghlan 2007, p. 71). They proposed that insider research was 'valid, and useful but provides important knowledge about what organisations are really like' (Brannick & Coghlan 2007, p. 72).

The second ethical issue was a concern about the impact on any findings from the research results becoming published and in the public domain. Findings of the research could be subject to scrutiny of Central Administration and in other areas of Trinity College where the participants work. Confidentiality was of the utmost importance and a guarantee of anonymity was emphasised.

PARTICIPANTS

When approval was received from the School of Computer Science Ethics Committee for the research to proceed, permission was also needed from the College Secretary to contact all staff on the administration mailing list. This email list contains up to 1400 addresses of administrative staff including Administrative Officers, Senior Executive Officers, Executive Officers, Technicians and other support staff. Access to this list is

always limited and group emails must be forwarded from the office of the College Secretary. Thus all the documents submitted to the Ethics committee were submitted to the College Secretary seeking approval to forward emails to staff members.

Refusals and non-returns handling – all participants were allowed to exit the survey at any point. All participants were allowed to skip any question and move to the next question or to partially complete a matrix of questions. If participants answered some questions but every question, the results were included in the completed survey and the skipped percentage was reported in the data table for each question in the final analysis.

MATERIALS

The survey consisted of nineteen questions which included a variety of types of question. These included:

- Multiple choice (only one answer)
- Multiple choice (multiple answers)
- Matrix of answers (only one answer per row)
- Rating Scale
- Comment boxes

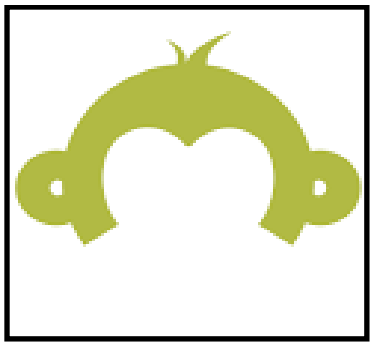


**Figure 3.1 SURVEY MONKEY LOGO (www.surveymonkey.com/)**

The survey tool used was 'Survey Monkey Select Plan' which allowed unlimited questions; up to 1000 responses per month; custom survey design and URLs; enhanced security; skip logic; Excel export and printable PDF features.

Initial analysis of the results was a default feature in the Survey Monkey select package. Raw data was exported to Microsoft Excel. Any charts or tables devised in Excel using Survey Monkey analysis tools were also exported and amended or configured as required using Excel.

PROCEEDURES

The validity and reliability of the procedures was confirmed by using the Survey Monkey tool which is recommended and supported by TCD IS Services. Survey Monkey complies with the security policies of TCD IS Services and approved by the School of Computer Science Ethics Committee. IS Services conduct Survey Monkey workshops for students and staff and provide documentation and backup support when required.

Survey Monkey Select plan provided an enhanced security option (SSL encryption). SSL – Secure Sockets Layer transmits private documents or information via the Internet. The URL supplied to participants is encrypted and data is downloaded over a secure channel.

Instructions to participants were as follows:

- Invitation via email to take part in survey using a URL given in the email message
- Participant's instruction sheet supplied including Declaration of Intent set by guidelines of the Data Protection Act and Trinity College Good Research Practice policy.
- Declaration of Interest Form which declared a conflict of interest.
- Introduction at the start of the survey informing participants of the option to exit the survey at any time without consequences.
- Anonymity statement given at the start of the survey which informs the participant that any revealing information given in the responses would be edited to ensure anonymity
- Information sheet with the research question and what the research hoped to achieve
- The approximate length the survey should take to complete
- Contact email addresses for the Researcher and Supervisor
- Statement that participant's formal agreement was given by clicking 'NEXT' to start the survey

Having received permission for the research to proceed from the Ethics Committee of the School of Computer Science and Statistics, permission had to be sought from the College Secretary to send the invitation to take the survey via a group mailing list for all administrators in Trinity College. Once this permission was given, all administrators in TCD were sent an email with a description of the project and the URL survey link on Survey Monkey.

The survey was live for three weeks as advised by IS Services as the most advantageous period to obtain a good response. During the last week before the cut-off date a reminder to those who had not taken the survey was sent out again through the College Secretary's office via the group emailing list.

When the survey was closed, the raw data of all the responses plus the preliminary analysis charts and tables produced by Survey Monkey's analysis tools were exported to Excel for further manipulation and analysis.

The raw data was formatted within Excel spreadsheets to view all responses from each participant as a unit and across section of questions. Charts and tables originally devised using the Survey Monkey analysis tools were redesigned and expanded using Excel in order to show the statistical data from responses to their best advantage.

To conform with the declarations made to the Ethics Committee, any opinion or information which referenced individuals or could indicate a breakdown of anonymity was ignored and not used in reporting results of the survey.

The invitation email was sent to administrative staff on 27 May 2013 and was live on Survey Monkey for three weeks. A reminder email was sent again via the office of the College Secretary to potential participants giving information of the closing date of the survey. The survey was closed on 18 June 2013 and the results were exported to secured storage with a backup.

### 3.6 Type of data gathered

The data that was gathered consisted of quantitative results which consisted of numeric and statistical data in response to 9 questions and qualitative results which included personal comments and opinions given in 10 open questions supplied by comment boxes. The pragmatic methodology continued into the approach to analysing the results as there was some quantitative data which could be interpreted in a qualitative way and some qualitative data which could be viewed in a quantitative way.

The data requested from the participants was divided into five sections:

- Demographics – Gender, Age, Education and Office staff deployment
- ICT equipment in the Administrative domain – Information storage and ICT equipment
- IS training – IS training and motivation within College and externally

- Staff development, lifelong learning and Continuous Professional Development
- Technology Readiness and Technology Acceptance

## 3.7 Limitations of Methodology: Problems encountered and lessons learned

Any problems which occurred were due to the Master's programme timeframe constraints and the Academic year structure.

Initially it was feared that the research question addressed to the specific population in Trinity College would not received approval from the Ethics committee. However, careful editing of the questions and adherence to the School of Computer Science ethics protocol with guidance from the Trinity Good Research Policy ensured that approval to proceed with the research was given quickly.

The problem of the Master's programme timeframe was that the collection of data was dependent on receiving ethics approval before any emails could be sent out to potential participants. Once this approval was received the research survey would have to be conducted immediately due to the limited period allowed to gather and analysis data and write up the findings within the indicative timetable for the research programme.

When both ethical approval and permission from the College Secretary was received the invitation to take the survey was sent to staff via email. The period of the survey coincided with one of the busiest times in the Academic Calendar. May and June are months when the Annual Examinations and Courts of Examinations take place. TCD Staff are historically under a lot of pressure during in the time of examination processes and would not have had much time to concentrate on questions about ICT. The high response rate was unexpected but very welcome for these research purposes.

# Chapter 4: Findings and Analysis

## 4.1 Introduction

This research hoped to explore the real life experiences of staff working in administration in a University in order to gain an insight into staff attitude to the introduction, utilisation and acceptance of new ICT and information systems. It was hoped that the findings would produce a detailed portrait of the administrative staff of Trinity College – a layered representation of who makes up this group and their opinions on working with ICT equipment and IS systems either to perform day to day tasks or planning future careers.

It is hoped that the knowledge gained from a comprehensive study of this workforce would assist management in planning successful future implementation of new systems or practices.

## 4.2 Report of findings of research

The survey was taken by 261 participants in total over three weeks between May and June 2013. Part of the requirements of the Ethics Committee was that participants would be given the option to exit from the survey at any point and that a response to any question or sub-question was not mandatory and did not prevent a participant from continuing onto the next part of the survey. Given this constraints every participant completed the survey to the end without opting out albeit with some questions skipped by individual participants. No participant's responses were rejected on ethical grounds.

Findings from the data divided into five sections - demographics; ICT equipment in the administrative domain; IS training; staff development, lifelong learning & CPD and Technology readiness and acceptance.

**Demographics – Gender, Age, Education and Office staff deployment**

The first section of the research focused on demographics. The research surveyed the gender balance of the respondents to obtain the female to male ratio and the age range of those who were surveyed and view any statistical patterns from the results. Participants were asked to describe their level of IT knowledge. Respondents were asked to indicate any and all educational awards and levels achieved to date. The survey required the staff to state whether they worked alone as the only administrative staff member in a section / work area or as part of a team of administrators.

**ICT equipment in the Administrative domain**

ICT equipment available for use by participants and the methods used to store information within work sections was surveyed. Participants were to indicate the age of their current PC or laptop. If participants had made any suggestions with regards to upgrading of ICT equipment, they were given the option to comment and expand further on any suggestions made.

**IS training and motivation within College and externally**

The research sought to find out what information systems training courses participants may have undertaken both within Trinity College and courses which took place outside the University. The research also wished to investigate the motives that influenced the decision of participants to enrol for any course. The survey sought to find if participation on any course was voluntary or mandatory; was suggested by a senior manager; was in order to obtain new skills or update skills or was part of a future career plan.

**Staff development, lifelong learning and Continuous Professional Development**

Respondents were asked to list any HR staff development programmes they may have attended and to give details of these courses. The research sought to obtain information about the reasons, incentives or influencing factors that motivated staff to attend any HR courses or workshops. The survey sought to find out if participation on any course was voluntary or mandatory; was suggested by a senior manager; was taken to discover administrative strengths; as part of a future career plan or to help deal with management of office relationships.

With regards to the EU commissioned '2011 Action Plan on Adult Learning: Ireland', participants were asked to select an opinion with a rating scale from 'Not Important ' to 'Extremely Important' on ICT and E-learning as part of development of lifelong learning. Further comments were also invited on this topic.

Participants were asked their opinion on a rating scale ranging from 'Strongly disagree' to Strongly Agree' on the contribution of updating ICT skills for career development within the University.

**Technology Readiness and Technology Acceptance** -

Respondents were asked to give responses to six statements which tested their willingness to embrace new ICT technologies using an adaption of Technology Readiness Index statements. Additional comments were invited from respondents.

Participants were requested to give opinions on some statements which tested their acceptance of technology. These statements had been adapted from the Unified Theory of Acceptance and Use of Technology (Venkatesh, Morris & Davis 2003).

### 4.2.1 Demographic Responses

ICT KNOWLEDGE DEMOGRAPHICS

The first question sought the perceived level of IT knowledge of the respondents. It is interesting to note that the majority opted for an intermediate level of knowledge while less than 3% of respondents consider that their standard was at a beginner level.

These figures can be compared to the applied prototype 'Study 2' carried out by Fred Davis as part of the original TAM research published in 1989 where the participants "had a range of prior experience of computers in general (35 per cent none or limited; 48 per cent moderate; and 17 per cent extensive)" (Davis 1989, p. 330*).*

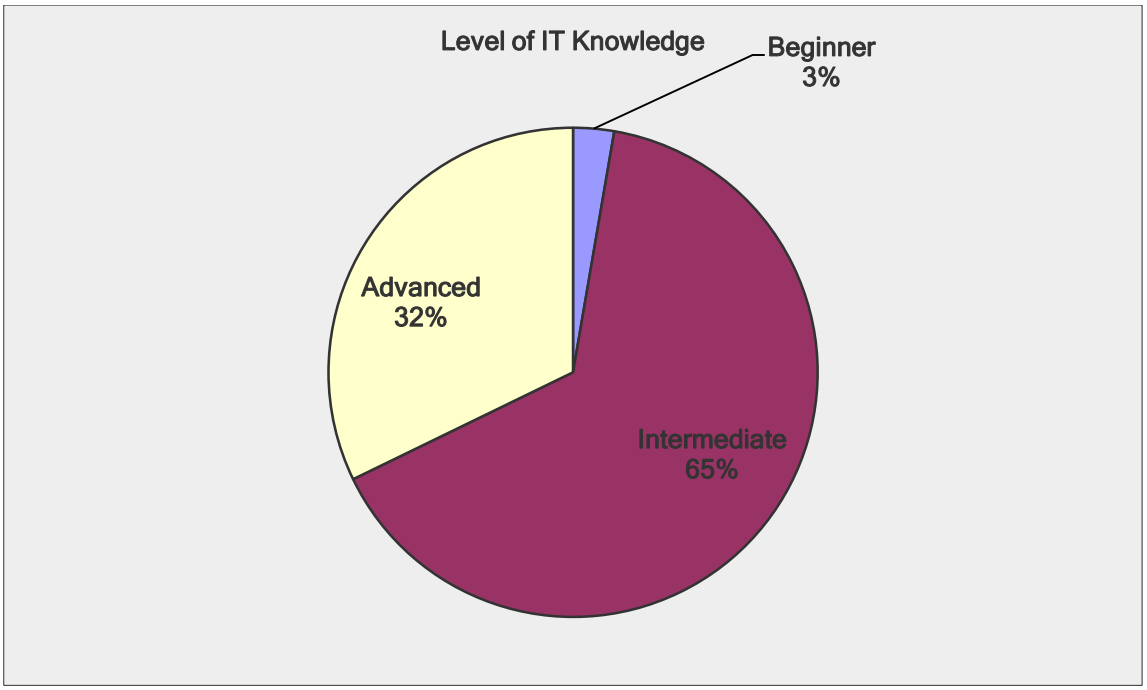



*Figure 4.1 – Graph of Level of IT knowledge -*

GENDER DEMOGRAPHICS

The question about gender proved that the gender divide for this survey was approximately 80/20. 81% respondents were female and 19% were male.

Of the total of 258 participants who responded to this question, 209 were female and 49 were male. 3 participants skipped the question of gender.

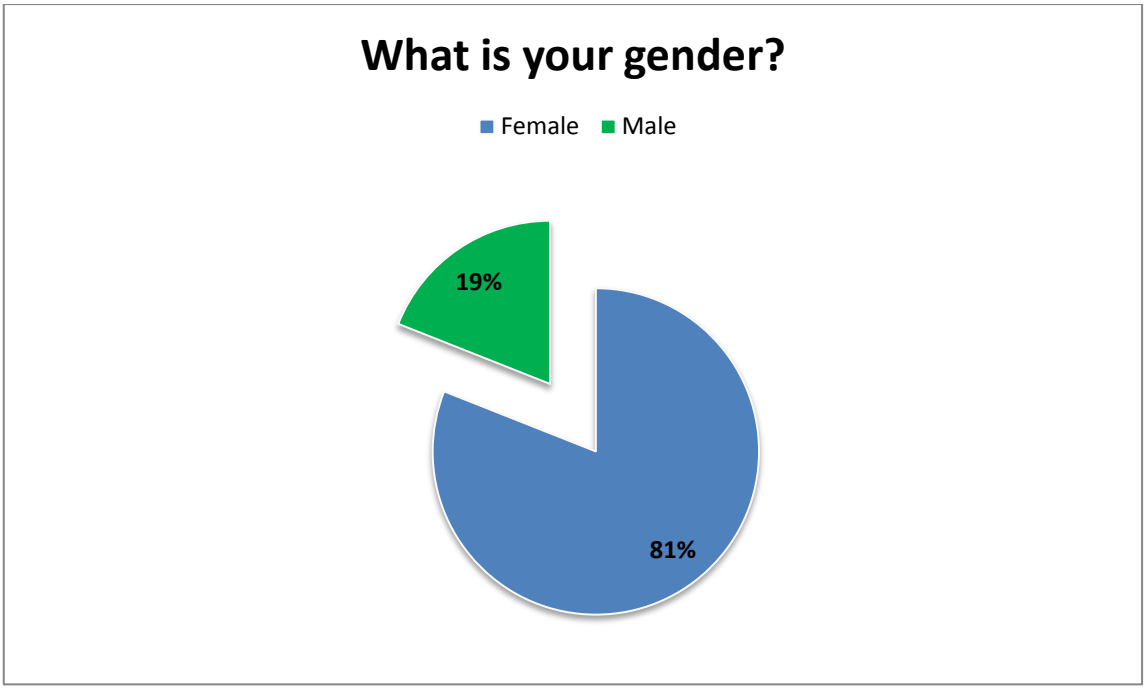



*Figure 4.2 – Graph of gender divide of participants*

AGE DEMOGRAPHICS

The age range was between 18 and 60 or more years and was divided into six age groups.

The School of Computer Science and Statistics Research Ethics Committee the research ethical form required confirmation that the research 'Verify that participants are 18 years or older and competent to supply consent.' (Appendix A).

The first declaration on the Informed Consent form was the confirmation `that the participant was '18 years or older and am competent to provide consent.' (Appendix C).

The response to this question indicates that the majority of participants in this survey were over 30 years. The age group with the highest score was for those respondents aged between 30 and 39 years. More than 63% of participants were aged between 30 and 49 years.

No participant was under 21 years of age and only 4.2% were 60 years and over.

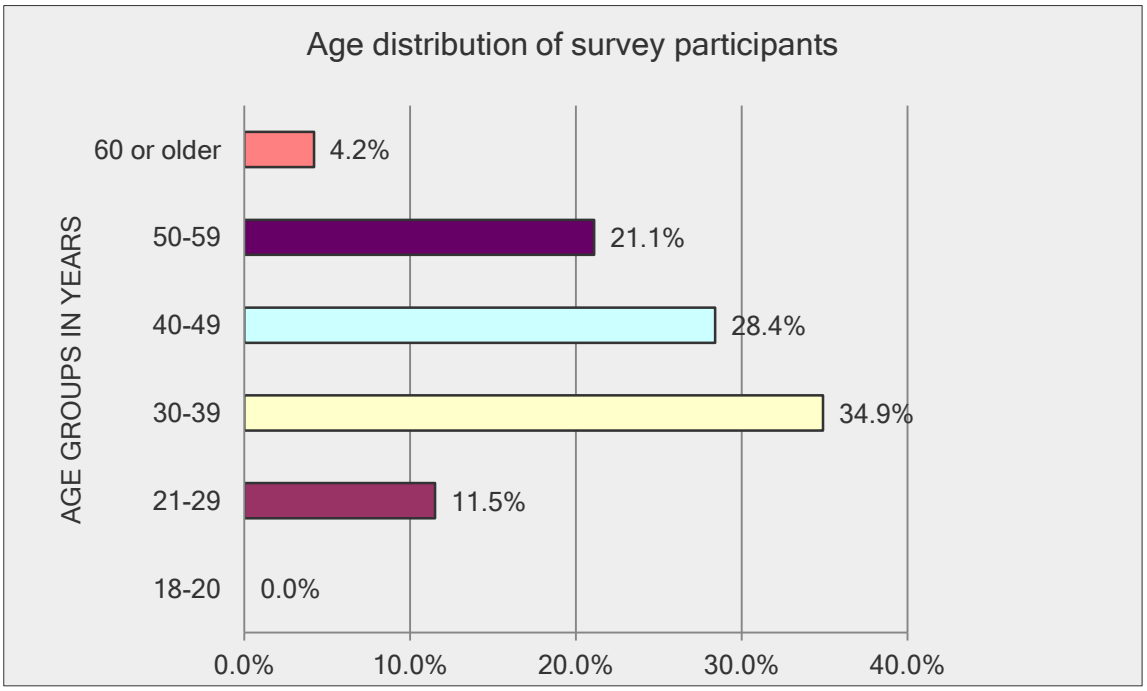



*Figure 4.3 – Graph of age distribution*

EDUCATIONAL DEMOGRAPHICS

The fourth question allowed respondents to choose any and all educational awards achieved and not just the highest award achieved to date. As this was a multiple choice multiple answer question, the results can be analysed so that participants are seen to have one or multiple educational awards. This option was to allow the variety of educational achievements be acknowledged. Therefore it is useful to look at the table of results where, for example, 121 gained the Leaving Cert out of 253 respondents but most of those who achieved a Masters, Post Graduate or Doctoral degree would have also been gained a Leaving Cert.

Table 4.1: Table of Educational Awards

| What educational awards have you gained? Please choose any that apply. | | |
|---|---|---|
| **Answer Options** | **Response Percent** | **Response Count** |
| **Leaving Certificate** | 47.8% | 121 |
| **Post Leaving Cert Diploma** | 22.5% | 57 |
| **Primary Degree** | 49.0% | 124 |
| **Post Graduate Diploma** | 15.4% | 39 |
| **Masters Degree** | 37.9% | 96 |
| **PhD** | 4.7% | 12 |
| **Other (please specify)** | | 28 |
| ***answered question*** | | **253** |

The range of educational qualifications of Trinity administrative staff indicated that 49% of respondents have a primary degree, 38% have a Master's degree and almost 5% achieved a PhD. Other educational qualifications included professional and vocational awards such as City & Guilds diplomas; Teaching Diplomas; ACCA Accounting diplomas; HR diploma and Professional Chartered Accounting qualification.

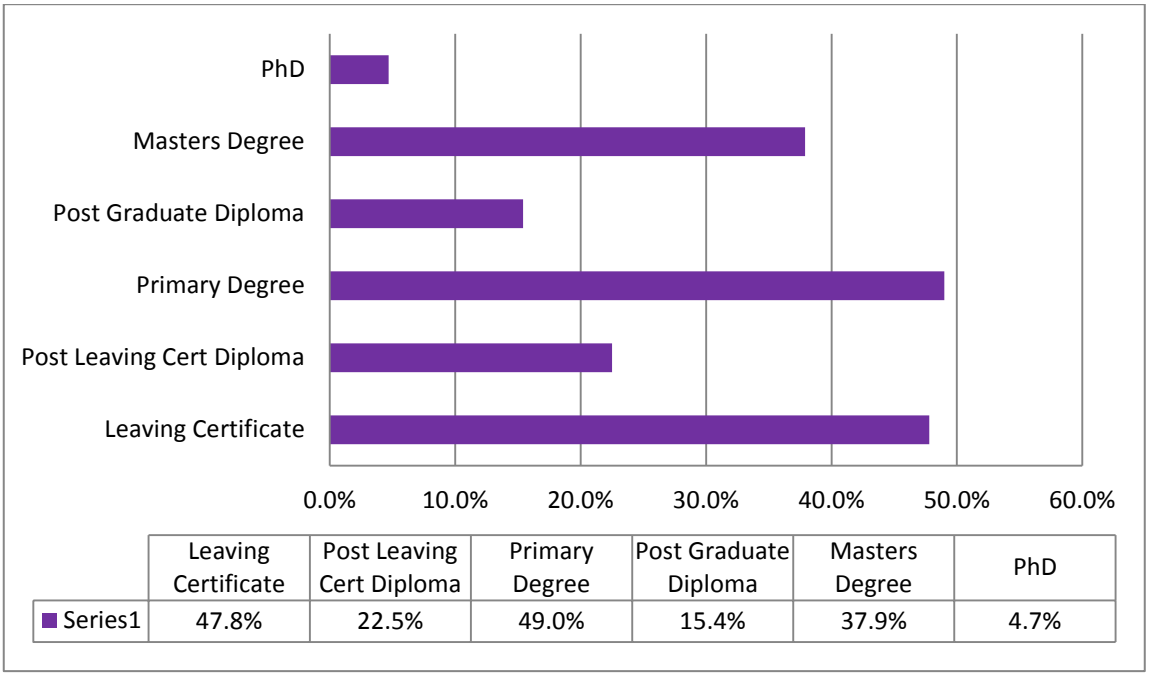



*Figure 4.4 – Graph of Educational Standards of Non-Academic Staff in TCD*

## OFFICE DEMOGRAPHICS

The fifth question sought knowledge of whether Trinity administrative staff worked in office teams or as lone administrators in their area of employment. The majority of respondents indicated that they work with 3 or more administrators in their immediate section.

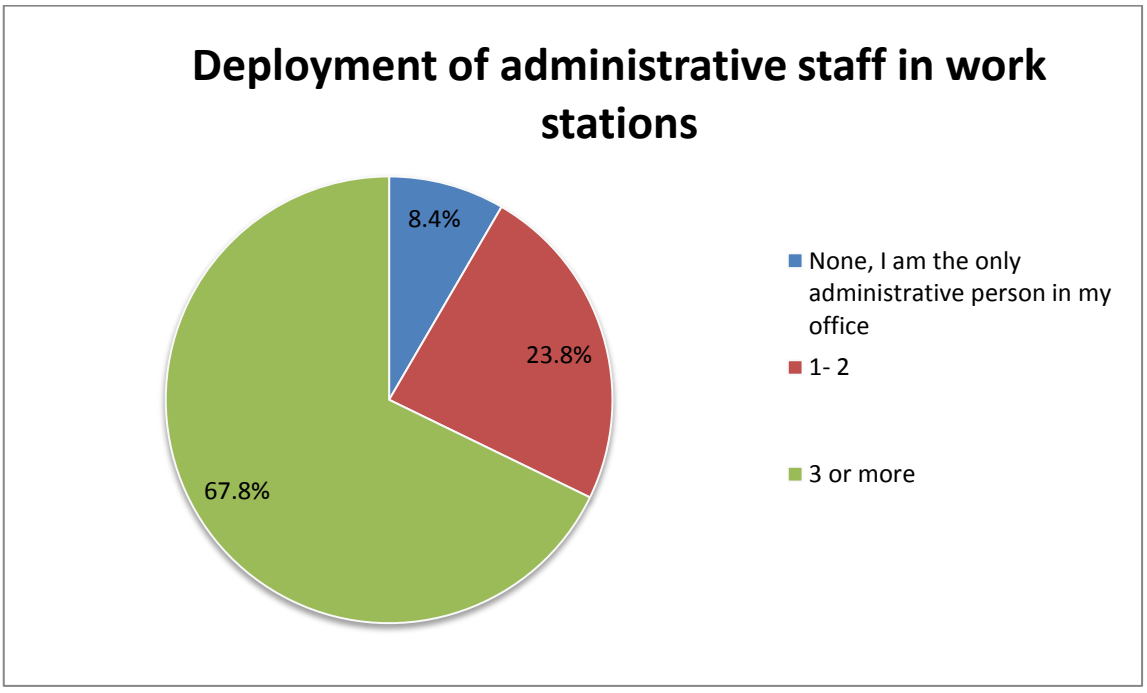



*Figure 4.5. – Graph of Deployment of administrative staff in work sections*

The major findings of the demographic queries are that of those surveyed 65% have intermediate knowledge of information systems; 81% are women; 63% are aged between 30 and 49 years; almost half are educated to primary degree or higher level and the majority work in office sections in teams of three or more administrative staff.

In conclusion from the findings of this research, the average staff member working in administration in Trinity College is a woman aged between 30 and 39 years; educated to at least a primary degree level with an intermediate knowledge of IT and working as part of a team of three or more administrative staff.

### 4.2.2 ICT equipment & storage solutions in the Administrative domain

BASIC ICT EQUIPMENT IN ADMINISTRATIVE OFFICES

Question six required that participants choose any ICT equipment to be found in their offices from a suggested list. The top three highest ranked equipment listed in this survey were Desktop PCs, Networked Photocopiers and Networked Scanners. A comment box allowed other ICT equipment not on the list to be specified which included Apple Mac desktops; IMacs; Apple Servers and Mac Books.

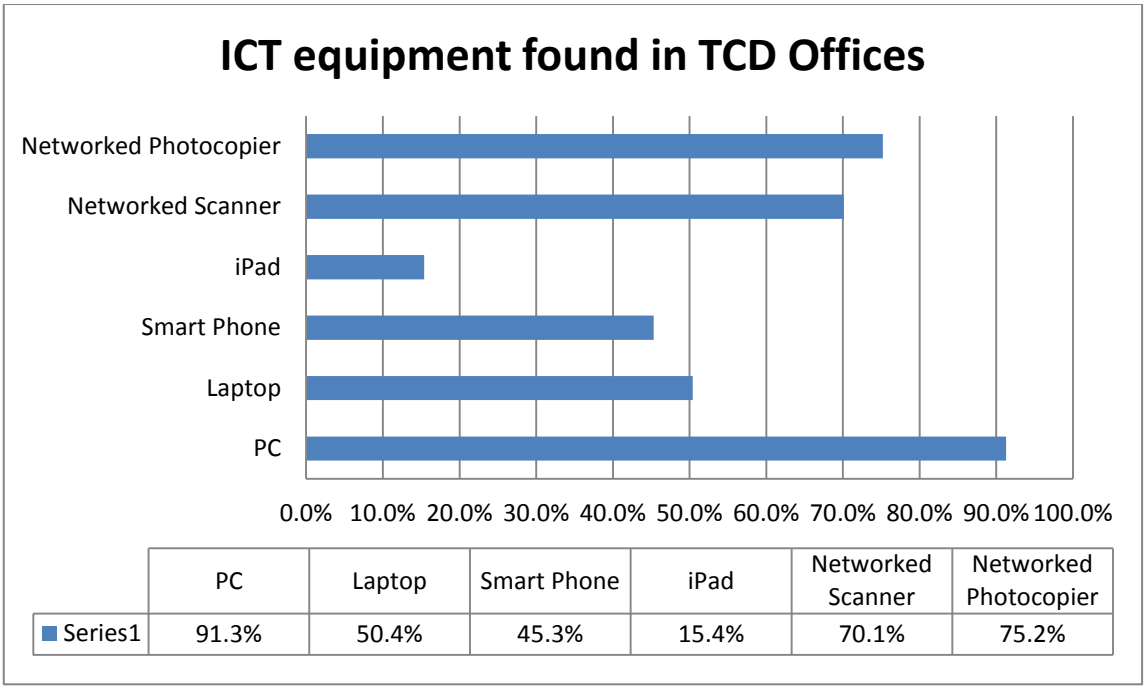



*Figure 4.6. – ICT equipment found in TCD offices*

OFFICE INFORMATION STORAGE

Knowledge of the variety of data and information storage solutions was the query in question seven and the findings proved that the paperless office is still far from the norm in offices in Trinity College with the majority of 91% respondents still acknowledging that paper files, folders and archive boxes were used to store data.

Electronic data storage solutions provided a more extensive range between the listed options on the survey and the other electronics solutions specified in the comment boxes. In the survey list of electronic options the fallback solution was storage on office PC hard drive before usage of External Hard Drive and portable storage methods. The indication of almost 24% of participants using Cloud storage could be a sign of movement to less traditional and more current or progressive and security conscious storage systems.

Other storage solutions used in specific offices as listed by respondents included central shared drives; networked servers, Sharepoint servers and 'School' servers. One participant's comment declared that their office had 'the aim to be completely paperless' but gave no further information as to the progress of this aim.

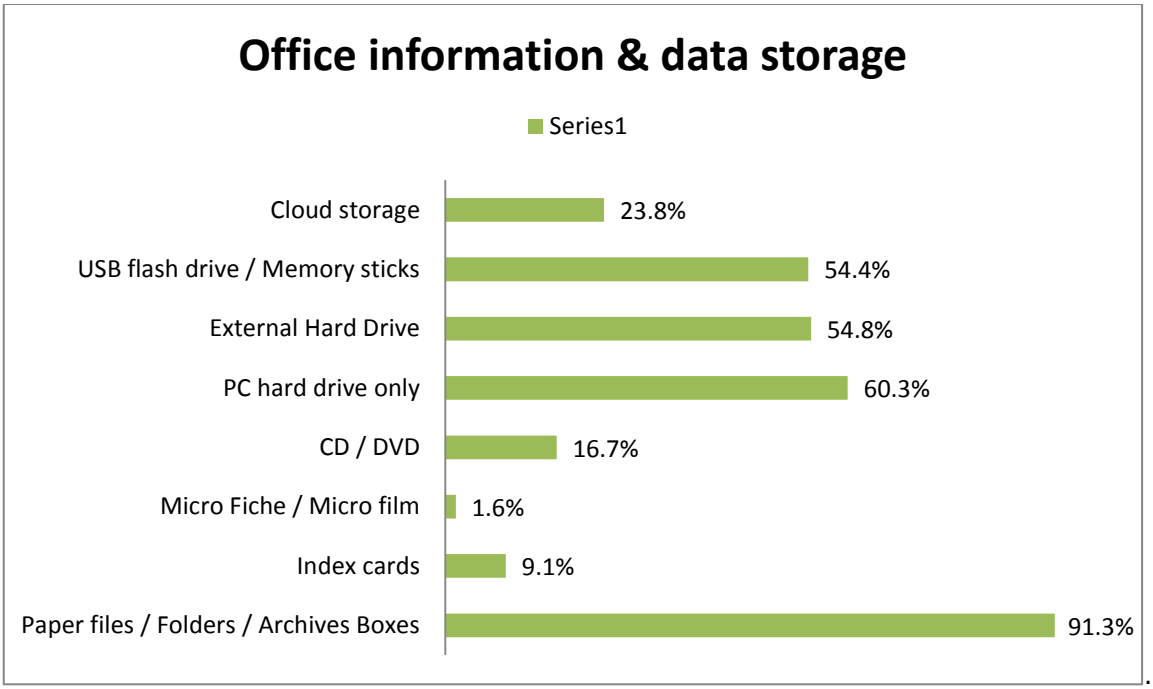



*Figure 4.7. – TCD office information storage solutions*

Question eight asked how old was every participant's PC and the responses to this question were reflected in the responses to question nine regarding staff making suggestions to upgrade ICT equipment. 50% of participants had a PC or laptop which was three years or older. Only 18.7% of respondents has a PC or laptop which was less than one year old.

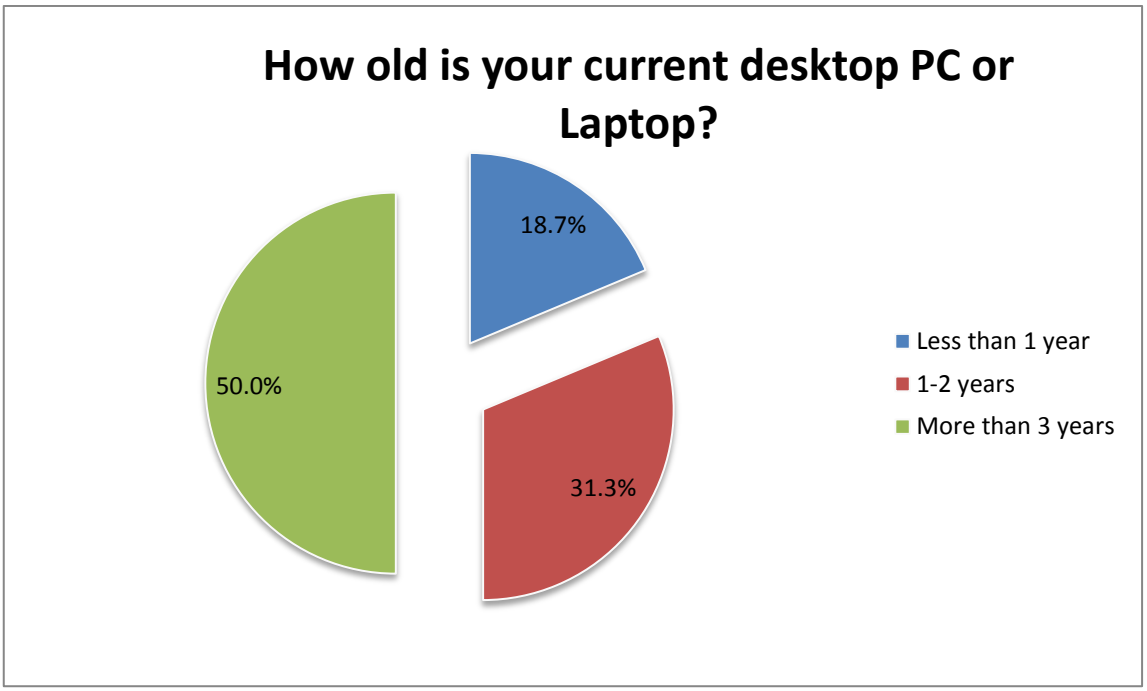



*Figure 4.8. – Graph of participants' PC / Laptop vintage*

UPGRADING ICT AND INFLUENCE OF ADMINISTRATORS

Question nine sought to query if TCD administrators played any role in promoting or influencing the upgrading of ICT equipment. Details were requested of those respondents who had made suggestions to upgrade ICT equipment in a comment box.

*Table 4.2 – ICT upgrading suggestions*

| Have you ever suggested upgrading of any ICT equipment in your office? | | |
|---|---|---|
| Answer Options | Response Percent | Response Count |
| **YES** | 53.6% | 134 |
| **NO** | 46.4% | 116 |
| **If 'YES' please give more details** | | 99 |
| *answered question* | | **250** |
| *skipped question* | | **11** |

The response count of those who said they had made ICT upgrading suggestions did not match the response count giving details of these suggestions as 35 people declined to give details.

Respondents to the survey went into great detail in many cases in their comments. Budget and financial constraints were mentioned as a reason for restriction on upgrading of ICT equipment in many instances. Details were given of 3, 4-5 and 5 year rotations of replacement of ICT equipment in some areas of administration. Mention was made of replacements occurring when 'Recurrent Equipment' grants were awarded to departments every few years.

The most positive outcomes were detailed whereby ICT equipment was installed on recommendation of Administrative staff member and the establishment of a departmental IT working group with regular discussion of ICT upgrades. Successful installation and upgrading of new ICT equipment and software and the establishment of IT working groups were as a result of co-operative Heads of Area and managers listening to the suggestions made by administrative staff as confirmed in the comments from respondents.

Any negative comments may have reflected the current financial restrictions which limit much needed upgrading and replacement of old, slow or frequently crashing ICT equipment. Some respondents commented that although they had made many suggestions to upgrade ICT as yet their suggestions had not resulted in implementation. In some extreme cases, staff relied on using their own ICT equipment to complete tasks.

Replacement of ICT equipment and IS software in some areas was reactionary, for example a College wide stoppage of support for older operating systems i.e. when Microsoft XP was no longer supported by IS services and needed to be de-installed and replaced with a newer version of Microsoft OS. New equipment installation could be as a result of the arrival of new staff to a work station, for example one staff member was unused to using an Apple Mac and sought a replacement with a PC. Another installation of new ICT equipment was due to the logistics of accessing a printer/scanner which was located 5 floors away from the respondent's work station.

In general the details of reaction to ICT upgrading suggestions were positive and recent acquisitions of equipment such as networked printers and scanners; dual screens and larger monitors or rotational purchase of new ICT equipment was the norm. However, apart from budget restraints, the replacement of ICT equipment was piecemeal, not generalised and dependent on the attitude of the Head of Area.

### 4.2.3 IS training and motivation

IS TRAINING WITHIN TRINITY COLLEGE

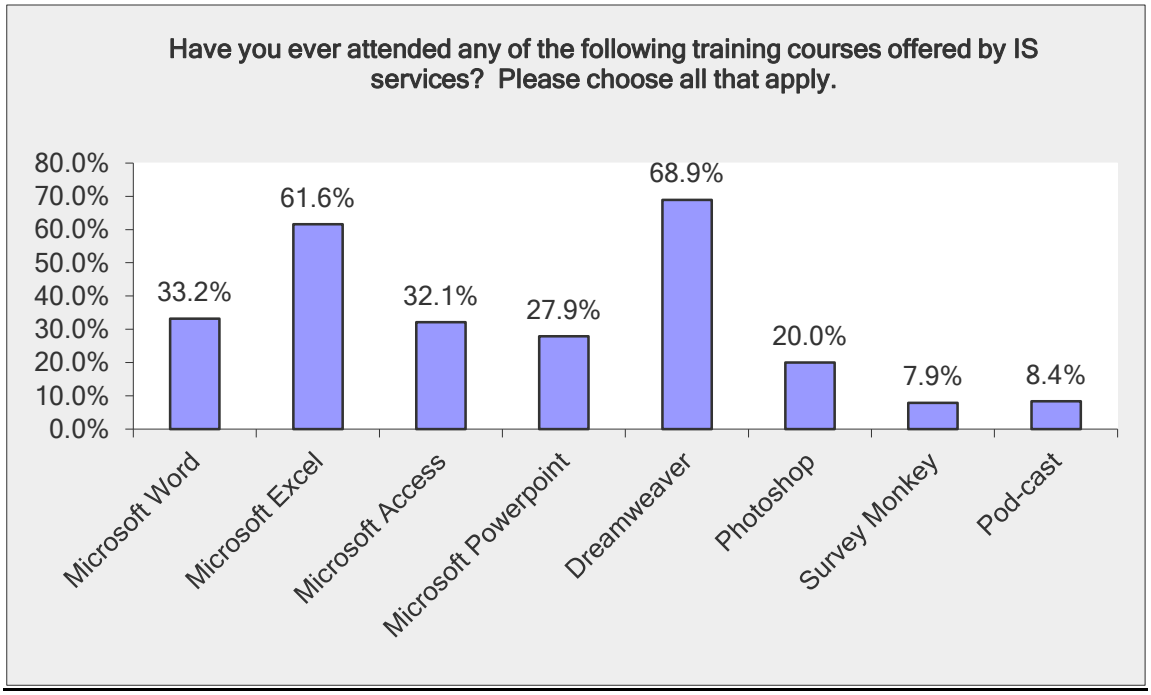



*Figure 4.9. – Graph of TCD IS training courses*

Questions 10 and 11 asked the participants to supply information on any courses given by Trinity IS services. Of the 190 respondents, the majority had taken part in a Dreamweaver workshop. Microsoft office training especially MS Excel followed in popularity.

Details given by respondents of other IS services training workshops included:

- Endnote
- Blackboard
- SEO optimisation workshop
- SPSS (Statistical Product and Service Solutions)
- SITS training (GeneSIS student information system)
- CMIS (Central Management Information System)
- Microsoft Sharepoint
- Anonymous examination marking
- Specific training for RPAMS (Research Proposal & Award management system)

The findings from questions 10 and 11 indicate the broad range of IS courses offered by TCD IS Services. Given the recent financial cutbacks to all areas, the extended list of IS training workshops is impressive under the circumstances.

Question 11 allowed participants to choose answers concerning motivation from a given list but also allowed for additional comments to be made if needed.
'To update IS skills' was the majority training motivational option chosen by respondents, followed by the motivation 'to learn a new IS skill'.

Of the additional details made by respondents a few comments may be of interest to both HR and IS services:

- Dreamweaver training was mentioned as a necessary job specification at interviews but one participant found this skill was never required during the actual experience of work.
- One work area required a tailored Excel course for their team which was provided successfully by ISS. An annual in-house refresher course was also provided by IS services.
- One respondent had a need for advanced training courses but found that the courses provided by IS services were too basic for requirement.
- A suggestion was made that IS services provide a form of TCD certification on completion of workshops and training courses.

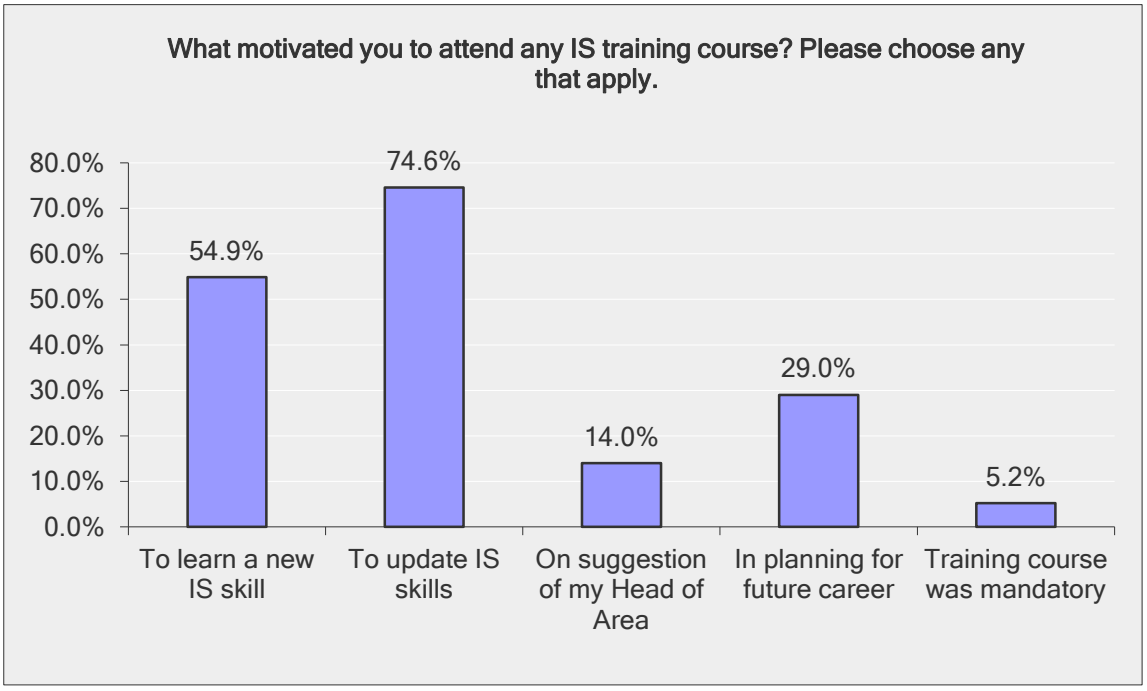



*Figure 4.10. – Motivation graph for TCD IS services training*

EXTERNAL IS TRAINING

Question 12 asked participants about attending IS courses based outside Trinity College. More than 40% of the participants declared that they had attended IS courses outside Trinity.

*Table 4.3 – Non TCD based IS courses*

| Have you ever attended an IS course based outside of College? | | |
|---|---|---|
| Answer Options | **Response Percent** | **Response Count** |
| **YES** | 40.8% | 98 |
| **NO** | 59.2% | 142 |
| **If YES, please give details** | | 93 |
| *answered question* | | **240** |
| *skipped question* | | **21** |

Those who had attended such courses were requested to give details in a comment box. In general responses to this last query mentioned courses taken before the participant became a member of staff in Trinity. The list of courses included training in basic office software applications such as the Microsoft Office suite. Respondents stated that they had attended professional Accounting and Project Management courses; Oracle programming and Microsoft Sharepoint.

Two respondents stated that external training was sought which was of a higher standard or level than offered locally or 'in-house'.

*Table 4.4 – Motivation & External IS courses*

| What motivated you to take any external IS course? | | |
|---|---|---|
| Answer Options | Response Percent | Response Count |
| To learn a new skill | 69.6% | 71 |
| To update IS skills | 63.7% | 65 |
| On suggestion of my Head of Area | 2.0% | 2 |
| In planning for future career | 40.2% | 41 |
| Training course was mandatory | 3.9% | 4 |
| Other (please specify) | | 13 |
| *answered question* | | 102 |
| *skipped question* | | 159 |

The motivation to attend external IS courses queried in question 13 gave interesting results especially when compared to the motivational responses to question 11 regarding internal IS courses offered by IS services.

Learning a new skill was chosen by a majority of 69.6%. Motivation from the Head of Area and the mandatory option scored markedly less than the statistics for similar motivation for taking internal IS courses. Planning for a future career was up by 11% as a motive for external IS training as compared to internal IS workshops.

Participants could give other motives for attending ICT outside TCD not among the option list and these included 'required training not available in College'; 'required technology training related to work role; and 'higher level of training and more specific training than available locally at the time'.

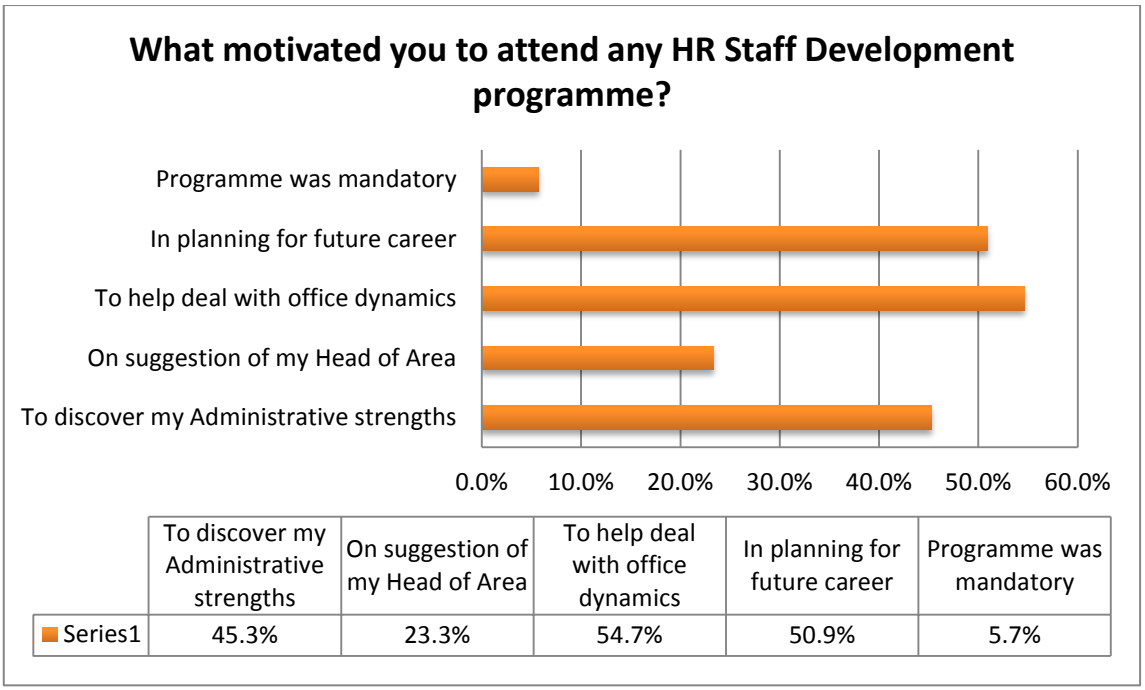
### 4.2.4 HR staff development, Lifelong Learning and CPD

HR STAFF DEVELOPMENT PROGRAMMES

Question 14 was an open-ended query answered by 181 participants. The list of HR workshops attended by respondents was long and varied and included the following:

- Management Training Suite
- Effective Teamwork
- Conflict resolution
- Minute taking skills
- Voice projection
- Health & Safety
- The skilled and confident administrator

- Supervisory management
- VDU assessor's course
- Assertiveness workshop
- Customer Service
- Customer Relationship management
- Performance management
- Effective Presentations
- Dealing with students in distress
- Workshop on Autistic Spectrum Disorders
- Writing for the Web
- Career and Life Planning
- Introduction to Supervisor's Role




| | To discover my Administrative strengths | On suggestion of my Head of Area | To help deal with office dynamics | In planning for future career | Programme was mandatory |
|---|---|---|---|---|---|
| Series1 | 45.3% | 23.3% | 54.7% | 50.9% | 5.7% |

*Figure 4.11. – Motivation and HR Staff Development programmes*

The motivational reasons for attending HR staff development programmes selected in response to question 15 indicate that 54.7% chose a programme 'to help deal with office dynamics'. This result could be a premise for future research as almost 68% of respondents work as part of an administrative team of 3 or more people.

The high scores for both of the options 'in planning for future career' and 'to discover administrative strengths' indicated the professional approach of administrative staff who wished to improve their skill base.

It may be useful to compare obvious disparity of results for common options in all three 'motivational' questions 11, 13 and 15. There were three influences or motives common to these three questions – a mandatory reason; the influence of a manager or the incentive of planning for a future career.

The influence of a Head of Area is stronger motivating factor for staff taking HR workshops than when taking part in Trinity IS courses or external IS courses.

'Planning for a future career' scores well across all three groups of responses but is one of the strongest motivational factors of those taking part in HR workshops or programmes.

In all groups of responses a mandatory motivation scores the lowest.

ADULT LEARNING AND ICT SKILLS

Question 16 quoted the '2011 Action Plan on Adult Learning: Ireland' published on behalf of the EU Commission which focused on "greater attention to ICT and e-learning for development of lifelong learning" (Country Report on the Action Plan on Adult Learning: Ireland 2011, p8).

Participants in the survey in the majority stated that ICT skills are extremely important for administrative staff as part of a lifelong learning plan. 71% out of a total of 235 respondents believed that learning new ICT skills was extremely important. 85% respondents believed e-learning was either extremely important or important as part of a lifelong learning plan.

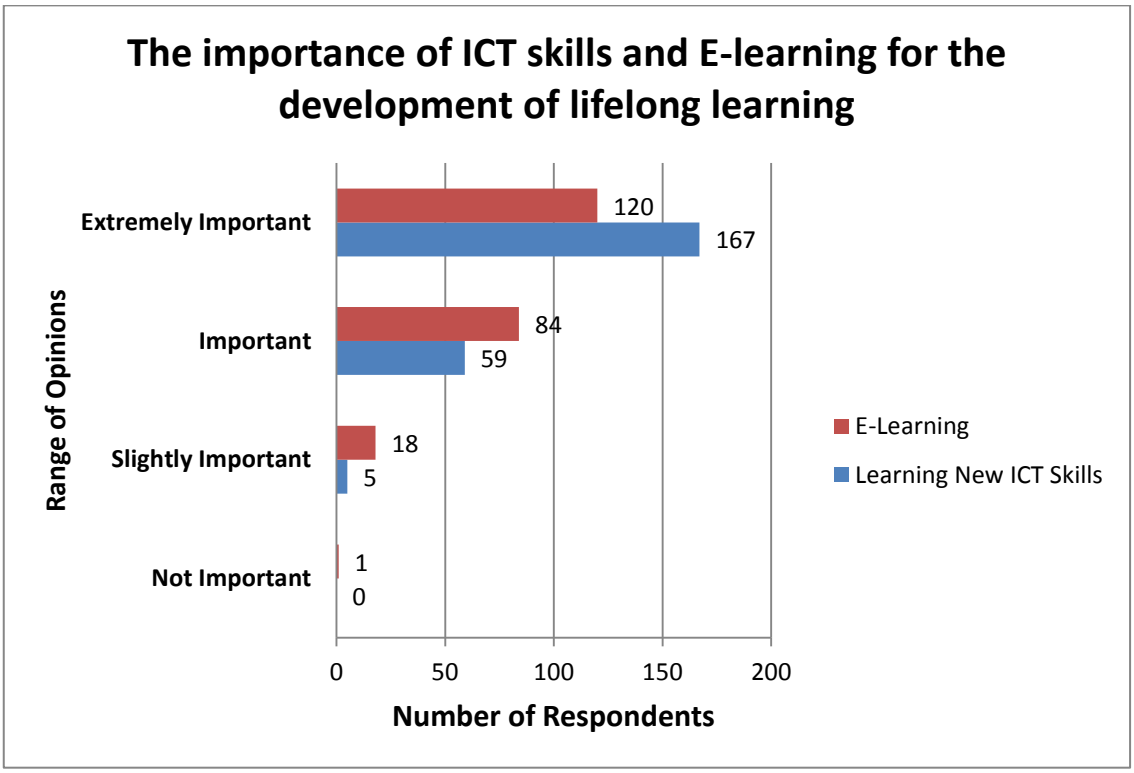



*Figure 4.12. – Importance of ICT skills & e-learning for lifelong learning*

Further comments developing upon this issue should be of interest to both the Human Resources department and Information Systems Service. Suggestions were made to produce a suite of E-learning programmes; podcasts; or access to online software tutorials which might benefit the administrative staff. The promotion of these innovations should be for the professional and personal development of staff.

One commentator stated that learning new ICT skills and e-learning was "*extremely important in the context of working within an educational environment where ways of working are constantly being updated in line with teaching methods*".

Another comment agreed on the importance of such learning skills "*for those working as administrators in the educational field. E-learning is the future*" and that Trinity College was already "*lagging behind our main competitors in this regard*".

Comments also cited that it was essential that ICT skills were included as part of a lifelong learning plan as a lack of knowledge in this area was limiting and could "*isolate many people in many ways*". One commentator believed that all admin staff working in the same area should be at the same level of ICT knowledge to avoid wasting time and decrease the pressure on staff skilled in ICT who may have to compensate for other unskilled staff.

## CONTINUOUS PROFESSIONAL DEVELOPMENT AND ICT SKILLS

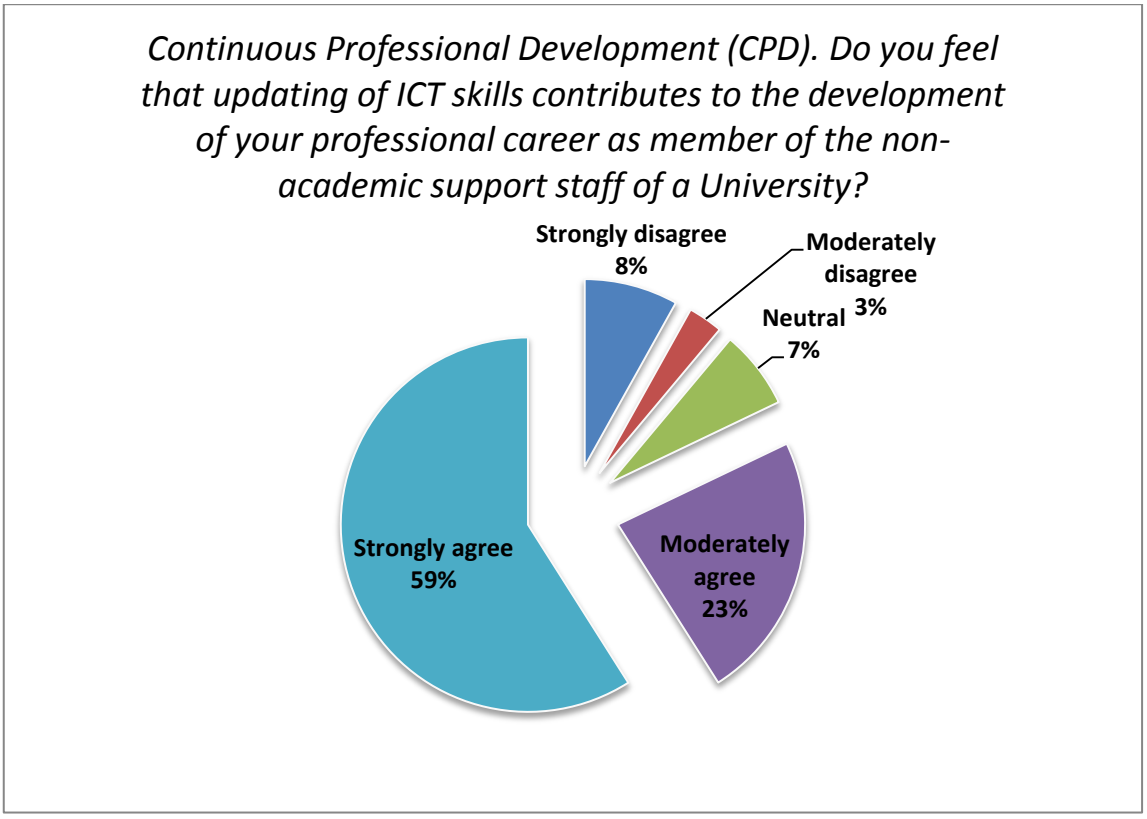



*Figure 4.13. – Continuous Professional Development and ICT Skills*

Question 17 was worded in a direct and simple way to find out if participants linked updating ICT skills with contributing to a professional career path of non-academic support staff in a university environment. An overall majority of 82% of the 234 respondents agreed or strongly agreed with the statement.

### 4.2.5 Technology Readiness and Technology Acceptance

TECHNOLOGY READINESS

In Question 18 for the purpose of this survey, Technology Readiness Index (TRI) statements were reduced and adapted into six basic statements to test participants' willingness to embrace new technologies.

Parasuraman (2000) developed a Technology Readiness Index to measure people's beliefs about technology. Parasuraman's research tests organised peoples' beliefs about technology along a hypothetical array from strongly positive to strongly negative. He concluded that peoples' position along this array could "be expected to correlate with their propensity to embrace and employ technology (i.e. their *technology readiness*)" (Parasuraman 2000, p. 309).

The responses to all six statements showed a positive majority agreeing with these statements with the highest score of 86% agreeing that 'technology makes you more efficient in your occupation'.

The statement which elicited the most even scores for all opinions was for the statement 'other people come to you for advice on new technologies' with Yes at 56%; No at 26% and Neutral at 20%.

29 participants made further comment on issues of technology readiness which could be grouped into several distinct themes:

- General acknowledgement of the importance of obtaining new ICT skills
- Apprehension about the efficiencies of new technology during the early period of implementation
- Problems of older staff believing that the level of IS training courses were too advanced

Respondents commented on the problems of learning new ICT skills in recent times which added to the challenge of the work place. Several commentators mentioned the steep learning curve and time consuming nature of training for new ICT skills.

Other comments stated that the participants realised the potential advantages of new systems but expressed their worries about lack of work efficiencies during the initial implementation and would prefer when the systems were one to two years established.

Attitudes to ICT skills and IS systems varied from those who viewed technology as 'simply a functional tool' to those who claimed to be fascinated by new developments.

One comment suggested that during initial implementation of new systems, the easy option was to 'fall back onto old technologies'.

Three participants made thought provoking comments on using ICT in Trinity as administrators:

*"Administrative staff need to understand ICT to support their work but also the ICT environments used by students and academic staff".*

*"In Trinity large scale institutional ICT projects are creating fatigue in staff and the appetite for local upgrades is suppressed".*

*"Technology has the ability to make work more efficient however the real challenge in an institution such as Trinity is to change the actual work practices. Purchasing the technology is the easy bit".*

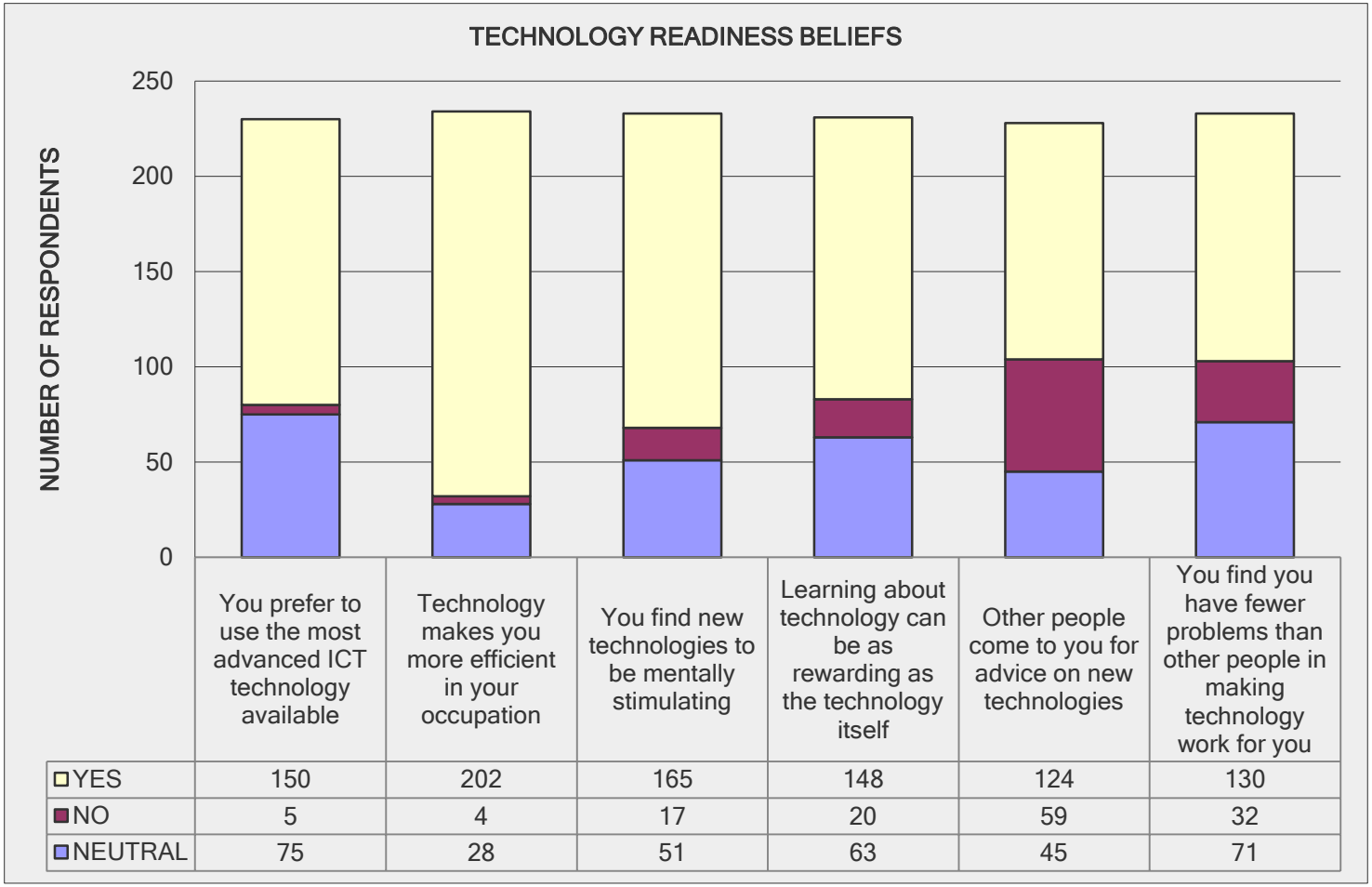



*Figure 4.14. – Graph of Technology Readiness Responses*

## TECHNOLOGY ACCEPTANCE

In order to research participants' intention to use and accept new technologies, the design of question 19 was a matrix of eleven statements adapted from the Unified Theory of Acceptance and Use of Technology as proposed by Venkatesh, Morris and Davis.

227 participants gave opinions on all or some of the technology acceptance statements. Positive reaction to all statements was in the majority of between 96% and 71% with the exception of statement nine.

The highest scored statements at 96% in agreement were:

- *'Information Systems enable me to accomplish tasks more quickly'*
- *'Overall, I find Information Systems useful in my job'*

The ninth statement was reversed in logical sequence to test the participants and allow those who wished to express their unease with Information Systems. A result of 79% disagreed with the statement and 21% were in agreement that the participant found '*Information Systems awkward to use'*. Of the 21% who stated that they felt information systems awkward to use 59% of them had a primary or post-graduate degree and 68% were in the 30-49 years age range.

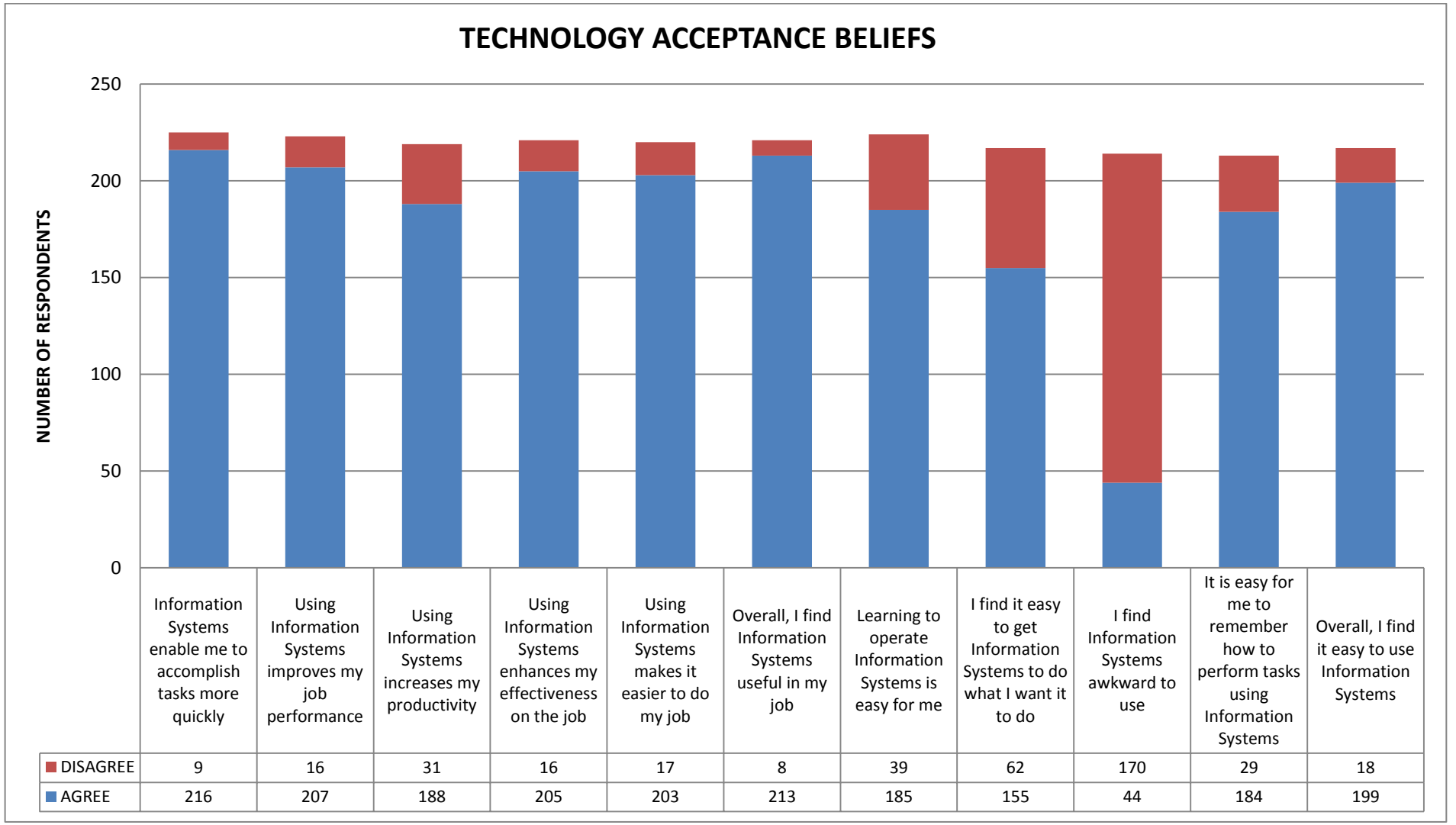



*Figure 4.15. – Graph of Technology Acceptance Beliefs*

## 4.3 Summary of Findings

The demographic results indicate that the majority of respondents are aged between 30 and 49 years; have an intermediate knowledge of IT, are women who have a primary degree or higher level of education and work in teams of 3 or more administrative staff.

The overwhelming majority of participants still use desktop PC or laptops and have access to networked printers and scanners. Smart phones and IPads are in use but to a lesser amount.

Storage of information still relies on paper files or folders in a majority of work sections. Evidence of increased use of electronic storage is stated in the results as is the move to external hard drives, USB keys and storage in the Cloud.

Replacement of ICT equipment as required and when funding is available can be found as a positive result of the influence of administration staff and the co-operation of management.

The wide variety of IS training programmes accessed by a majority of respondents within Trinity and in external training venues as required for specific and technically advanced instruction is evident in the findings. Self motivation was the main influencing factor for attending any IS training courses.

The findings showed that there was a broad range of HR staff development courses and workshops offered and availed of by participants. The main influence which drove respondents to attend these courses was dived between the self-motivating factors of furthering future careers and gaining administrative strengths and learning to deal with office political scenarios.

The results found that participants in the majority believed that ICT and e-learning was extremely important to the development of lifelong learning.

The findings proved that respondents were in strong agreement the updating of ICT skills contributed to the development of professional careers of the non-academic support staff of a University.

The responses to the statements of Technology Readiness showed a positive majority in all six statements with the highest number of respondents agreeing that ‘Technology makes you more efficient in your occupation’. The findings for Technology Acceptance gave positive majority responses to all statements with the exception of the reverse logic statement about ‘IS systems are awkward to use’.

# Chapter 5: Conclusions and Future Work

## 5.1 Introduction

The strength of this study was in the initial simple direct questions which addressed the staff to give details of themselves, their work situation and their interaction with technology.
The findings produced a portrait of well educated people willing to engage within limitations with new ICT technology and who had suggestions to make on improving and enhancing their work by training to update IS skills and accepting new systems.

Some staff were able to express their frustration at the slow rate of upgrading to new ICT equipment due to budgetary restrictions or lack of funds. Others confessed their anxiety during periods of implementation of new systems when productivity and efficiency was affected as new processes were slowing being assimilated.

The research question asked if staff working in administration in Trinity College adapt well when faced with potential changes in Information systems in a period of recovery from recession and increasing growth within the third level sector and utilize IS skills and knowledge of ICT in order to reach their full potential.

The queries central to the research were as follows:

- What range of IS systems are used by administrators throughout the organisation?
- How do administrators prepare or train for potential new IS systems to replace established IS systems?
- Are IS training supports and workshops utilised to assist administrators in accepting, adapting and using ICT applications?
- Does increased knowledge of IS systems and ICT applications prove useful in the workplace and contribute to job satisfaction?
- Apart from mandatory training for new workplace ICT applications, have administrators obtained further training in the area of Information Systems?
- What motivates administrators to seek further training/education in IS systems?
- If the motivation to increase IS knowledge is to further career prospects, do administrators feel supported to achieve this goal by their department / administration area and College in general?

- Are administrators aware of the EU strategy policy of Continuous Profession Development and the promotion of CPD for administrators within Trinity?

## 5.2 New and interesting findings

Simple and direct questions were addressed to the administrative staff who work with information systems to gain insight into their views about the effects of using ICT and how qualified they are to meet changes to IS systems as part of a strategic plan.

The findings met the objectives of the research question and the good sample size of 261 from a population of 1474.

Results produced good quantitative data but opportunity was given to the participants to give further information in comment boxes. The resulting qualitative data was very informative and expanded the findings.

Findings were divided into 5 sections – demographics; ICT equipment and storage; IS training; Staff development, Lifelong learning & CPD and Technology Readiness and Technology Acceptance.

**DEMOGRAPHICS** - Gender, Age, Education and Office demographics;

The main findings were that surveyed participants in the majority had an intermediate knowledge of IT; the ratio of women to men was 5:1; 63% were aged between 30 and 49 years; 49% had been educated to primary degree or higher academic level and 67.8% worked in teams of three or more administrative staff.

Of interest was the fact that less than 3% acknowledged a beginner's level of IT knowledge. The gender balance was 81:19 per cent. While 35% of the respondents were in the 30-39 age category, no one under 21 years took part in the survey and only 4.2% was 60 years or over. Only 8.7% worked as the lone administrative person in their work station.

The outcome from the demographic findings which describe a workforce with the majority being young to early middle aged women with high standards of education and knowledge of IT working in teams could influence IT and HR managers with future preparation and implementation of new changes. Inclusion and consultation by management with

administration staff when making strategic planning decisions could result in more cooperation and acceptance of new systems or methods of working.

**ICT EQUIPMENT** - Information storage and ICT equipment in the Administrative domain

A majority of 91.3% of respondents had a desktop PC but 50% claimed that this equipment was 3 year or older.

The paperless office is not the norm in Trinity College with 91.3% stating using paper files and folders as a method of information storage. While electronic storage was generally held on PC hard drives, of current interest was that almost 24% opted to store information in the Cloud.

63.6% of respondents had made suggestions to upgrade ICT equipment. Details of reaction to these suggestions ranged from the positive where all ICT equipment was replaced on a regular rotational basis with some areas having IT working groups to discuss upgrades etc. The more negative reactions gave information of ICT equipment as old as 9 years constantly crashing and staff having to bring personal laptops to work to complete their work tasks. Rotational replacement of ICT equipment and IS software occurred in some areas but most were restricted by current financial constraints. Replacement had occurred in some incidences on a reactionary basis when ICT equipment failed or when software was no longer supported by IS services.

**IS TRAINING** - IS training and motivation within College and externally

Of the training courses and workshops provided by TCD IS services, those attended by most staff had been for Dreamweaver and Ms Excel. 'To update skills' was the major motivation to attend any TCD ISS courses.

Of interest were some suggestions from respondents including introduction of advanced levels of training as the current IS courses offered were found to be too basic. Another suggestion was the introduction of some form of TCD ISS certification on completion of any workshop or course provided.

40% of respondents attended IS training outside Trinity and the main motivation to attend these external courses was to 'learn a new skill' which scored 69.6%. Comments stated that external venues provided a higher level of training or more specialised training which was required by staff.

If financial constraints were removed, it is obvious from the respondents' comments that they would avail of more advanced training courses or workshops within Trinity College if they were offered by IS Services. Perhaps there is scope for IS Services to run accredited and certified courses which would bring in more revenue and help maintain and expand the services currently offered.

**STAFF DEVELOPMENT, LIFELONG LEARNING & CPD**

Attendance at Staff Development courses provided by the Human Resources department was motivated in the majority in order to 'deal with office dynamics' which is of interest especially as over 67% of administrative staff work in teams of three or more. Taking courses to plan for a future career or to discover admin strengths were strong motivating factors.

The comparison of all three 'motivational' questions 11, 13 and 15 to seek reactions to common options demonstrated that 'Planning for future careers' was a stronger incentive for attending training compared to management stimulus. A mandatory reason for taking any training course was a minimal motive.

The influence of a Head of Area was a stronger motivating factor for staff taking HR workshops than when taking part in Trinity IS courses or external IS courses. The mandatory option scored lowest in all cases as a motive for attending IS or HR staff development courses. 'Planning for a future career' was scored highly but was stated as one of the strongest motivational factors for those taking part in HR workshops or programmes.

The conclusion to be drawn is that administrative staff were self motivated to attend courses, workshops and training whether within the University campus or externally.

The correlation between ICT skills & e-learning for the development of lifelong learning mentioned in the '2011 Action Plan on Adult Learning: Ireland' was endorsed by this survey when ICT skills were judged 'extremely important' at 71% and e-learning judged either 'extremely important' or 'important' at 85%.

Suggestions were made for the production of a suite of E-learning programmes; podcasts or online software tutorials and that these innovations should be for the professional and personal development of staff. It could be concluded from the comments that some of staff cannot afford the time to attend IS training or HR workshops but would benefit from e-learning packages which could be devised by both IS Services and the HR department.

One commentator stated that learning new ICT skills and e-learning was "*extremely important in the context of working within an educational environment where ways of working are constantly being updated in line with teaching methods*".

Another comment agreed on the importance of such learning skills "*for those working as administrators in the educational field. E-learning is the future*" and that Trinity College was already "*lagging behind our main competitors in this regard*".

To conclude queries on career development and the concept of Continuous Professional Development, 59% of respondents strongly agreed that updating of ICT skills contributed to the development of their professional career as a member of the non-academic staff of a University.

## TECHNOLOGY READINESS & TECHNOLOGY ACCEPTANCE

The responses to the Technology Readiness Index (TRI) statements, adapted for this research to test participants' willingness to embrace new technologies, achieved the highest score of 86% in agreement that 'technology makes you more efficient in your occupation'. All six statements achieved a positive majority in agreement from the participants.

The most interesting comments concern the introduction of new systems in College and they include fear about lack of efficiency during implementation, fear of the amount of time and effort needed to learn about a new system and the temptation to return to using known systems.

- Participant mentioned their apprehension about the efficiencies of new technology during the early period of implementation. Relevant realistic training should be given to all members of administrative staff before the system goes live. Perhaps project managers could ensure that all testing of new systems to resolve any problems is carried out before the implementation of any new system.
- The steep learning curve experienced when in training for implementation of new systems is cited as a negative factor in acceptance of new systems. Respondents commented that learning a new system proved a steep and time consuming learning curve. Perhaps training for implementation for new

systems should take into account the time pressures administrative staff undergo and make allowances for such staff who may be anxious at the time of training.

- Some respondents expressed an inclination during the testing / implementation period to 'fall back' into using an older known system. Others commented that they would engage with the new system when the technology had been 'around for 1-2 years, established and well tested' before they would get involved. Other respondents commented that impatience with a new system would lead to a tendency to 'fall back onto old technologies'. The resolution of this problem would be to ensure that during training and implementation that staff would be encouraged to be aware of the improved quality of work and other advantages to be gained from using a new system. Removal and quick phasing out of older systems to avoid inertia or habit forming problems occurring among end users.

The comments from respondents described problems for older staff who in some cases believed that the level of IS training courses was too advanced for them. Other comments made by younger members of staff suggested that there was poor support from College to encourage older staff to keep up to date with IT developments which resulted in extra pressure at departmental level and older staff feeling left behind.

Three participants made thought provoking comments on using ICT in Trinity as administrators:

*"Administrative staff need to understand ICT to support their work but also the ICT environments used by students and academic staff".*

*"In Trinity large scale institutional ICT projects are creating fatigue in staff and the appetite for local upgrades is suppressed".*

*"Technology has the ability to make work more efficient however the real challenge in an institution such as Trinity is to change the actual work practices. Purchasing the technology is the easy bit".*

227 participants responded to all or some of the matrix of eleven statements on Technology Acceptance adapted from the Unified Theory of Acceptance and Use of Technology

Positive reaction in agreement to most of the statements was between 96% and 71%.

The highest scored statements at 96% in agreement were:

- *'Information Systems enable me to accomplish tasks more quickly'*
- *'Overall, I find Information Systems useful in my job'*

The ninth statement was reversed in logical sequence to test the participants and allow those who wished to express their unease with Information Systems. A result of 79% disagreed with the statement and 21% were in agreement that the participant found '*Information Systems awkward to use'*. Of the 21% who stated that they felt information systems awkward to use 59% of them had a primary or post-graduate degree and 68% were in the 30-49 years age range.

## 5.3 Generalizability of findings

The question of generalizability of the findings of this research can be measured by verifying the reliability and validity of the research methods. Reliability refers to the situation where research results can be reproduced or replicated using similar collection techniques and findings analysis either by a different researcher or at a different time. (Saunders et al, 2012)

Validity is when the data is proved to truly measure reality. Validity can be verified both by external validity and internal validity.

In the case of External validity – could the study's research findings be generalised to other relevant groups? For example, could the research findings of this study of the attitudes to ICT by administrative staff working in Trinity College be a general example of all University administrative staff?

In answer to this query, two questions must be asked:

- Is the sample representative?
- Was there a good response rate?

As the population of TCD administrative staff is 1474 and less than 10,000, the adjusted minimum sample size calculation formula must be used.

Adjusted minimum sample ...

$$n' = \frac{n}{1 + \frac{n}{N}}$$

$$n' = \frac{261}{1 + \frac{261}{1474}}$$

giving

$$n' = 221.75 \approx 222$$

Where

n' is the adjusted minimum sample size

n is the minimum sample size

N is the total population

(Saunders et al. 2012, p. 660)

The respondents to the survey were 261 in total and the current population of non-academic staff in TCD is 1474, using the calculation formula, as shown above, the minimum sample size is 222.

Therefore this minimum sample was surpassed and the survey response size would be representative of the total administrative population in Trinity.

The testing of internal validity is where research demonstrates a casual relationship between two variables e.g. research participants who agree with the Technology Readiness statement that 'Technology made you more efficient in your occupation' would also agree with the Technology Acceptance statement 'Using Information Systems makes it easier to do my job'. In the findings of the survey, 234 participants responded to the Technology Readiness statement, 202 agreed with the statement (86%). In the findings for Technology Acceptance, 220 participants responded to the statement and 203 were in agreement with it (92%).

The generalizability of this research could apply to other relevant groups as the method and style of the questionnaire is simple, non-specific and direct. The External and Internal Validity tests have been proven. The size of the research participants is more than a minimum sample size. A casual relationship has been proved between two variables in the research.

## 5.4 Current knowledge of Technology Acceptance & research findings

In 2012, the unified theory of acceptance and use of technology (UTAUT) was extended by Venkatesh, Thong and Xu to study acceptance and use of technology within a consumer context. UTAUT was developed in 2003 to study 'the prediction of behavioural intention to us a technology and technology use in *organizational contexts*.' (Venkatesh et al. 2003, p. 157). They now included three new constructs habit, hedonistic motivation and price value and referred to this extended theory of UTAUT as UTAUT2. (Venkatesh, Thong and Xu 2012) Findings of Venkatesh et al. to extend UTAUT indicated that different groups of consumers 'attach different weights to various factors that influence their technology use' (Venkatesh, Thong and Xu 2012, p. 174).

The construct of habit was one of the findings of this research as some respondents admitted that during problematic early implementation of new systems use of the old system was a fall back option. Findings of the research confirmed the construct of hedonistic motivation as some participants detailed their enjoyment when using up to date ICT.

The findings of the current study conform very much to the original UTAUT model whereby age, gender and experience/education variables moderate the effects of the constructs on behavioural intention and use behaviour.

## 5.5 Limitations of research

Time restraints –this research was limited due to the tight schedule from the December to June to study the research question, design the method of data collection, obtain ethical approval and permission to contact the survey population and run the survey at one of the busiest periods in the academic year. Due to the limitations of this research which could only obtain a snapshot of the effects of strategic changes ICT systems on the administrative staff in a University environment. It would be useful to extend this research to a longitudinal study which may expand the research of technology acceptance of University administrative staff working with ICT.

Research strategy – given the logistics of the University campus and the time restraints, it was necessary to gather information by survey. Small interview or discussion groups might have extended the findings especially with any qualitative questions. Longer face to face interviews with senior management in Human Resources, IS services and College Central Administration could have widened the scope of the research

Ethical Issues – the conflict of interest due to the issue of insider researcher may have had some influence on the design of the research or the analysis of the data. Insider research as defined by Brannick and Coghlan 2007 is research undertaken by 'complete members of organizational systems' rather than researchers who temporarily join an organisation to with the purpose of carrying out research. (Brannick & Coghlan 2007, p59) They argued that insider research "in whatever research tradition it is undertaken, is not only valid and useful but provides important knowledge about what organisations are really like, which traditional approaches may not be able to uncover." (Brannick & Coghlan 2007, p. 72).

## 5.6 Future directions for research

This research hoped to gain a greater insight into the range of knowledge and utilisation of IS systems among non-academic administration staff; their motivation to accept and adapt to future ICT applications to complete their work and to judge if training / further education is linked to career prospects and Continuous Professional Development.
The findings achieved these objectives given the limitations of the research method and time constraints.

Further longitudinal studies over an extended period of time using a mixed method approach to include group and one to one interviews and workshops would expand this area of interest.

Comments made by participants would indicate that many are self motivated to extend their ICT skills. Some staff stated that they were unaware of the range of programmes available to staff within the University for Staff Development.

More research is needed to find if any progress resulted from the '2011 Action plan on Adult Learning: Ireland' was published on behalf of the EU commission which emphasised greater attention to ICT and e-learning for lifelong learning development. Further research is required to enquire if any policies have been put in place on instruction from the EU to

develop the ICT skills of people already in the work place and not just school leavers, the unemployed and the retired.

Continuous Professional Development strategies are in place for many professional bodies. There is a Performance Management Development Scheme (PMDS) promoted by the HR department, it is linked to sustaining progress payments and potentially to future national pay awards. Otherwise there is no link to correlate training and promotion or pay rewards. This could be an area of further research given that 82% of participants in this research agree that updating ICT skills contributes to the development of professional careers within College.

## 5.7 Conclusion

The study gained an insight into the attitude and acceptance of the well educated and self motivated administrative staff willing to increase ICT skills to improve their work experience and develop their professional career within the University.

This short study could be used as a basis for further research exploring the opportunity to expand the use of e-learning and further training in ICT skills linked with strategic organisational polices and continuous professional development strategies for the benefit of staff and the organisation.

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# Appendices

## Appendix A: Participant Information Sheet

**UNIVERSITY OF DUBLIN**

**TRINITY COLLEGE**

**SCHOOL OF COMPUTER SCIENCE AND STATISTICS**

**Participant Information Sheet**

**'Administrative Staff in Academia: Utilising ICT to adapt and develop support staff roles'.**

**Researcher:** Judith Lee, School of Computer Science and Statistics.

**Supervisor:** Dr Denise Leahy, School of Computer Science and Statistics.

You are invited to participate in this research project which is being carried out by ***Judith Lee*** as part of a dissertation in the Taught Master's Programme M.Sc. in Management of Information Systems in the School of Computer Science and Statistics, Trinity College Dublin.

Anonymity is required of all responses given by participants and care will be taken that any revealing information mistakenly given will be edited to ensure anonymity of all data.

I declare a conflict of interest as I am a member of the administrative staff of Trinity College Dublin. I work as an Executive Officer in the Department of Mechanical and Manufacturing Engineering, School of Engineering.

Your participation is voluntary; you can withdraw at any time without any consequences of any kind.

*The study is designed to investigate how Administrative Staff utilise Information Systems to adapt and develop their role as support staff in Academia.*

*This project is seeking to obtain a College wide survey of how data is gathered using information systems ranging from paper files to current ICT applications. The research is seeking the views of Administrative Staff on using IS systems and whether they obtain knowledge of new ICT applications to improve their day to day work experience or as part of a career plan.*

*This project does not seek to enquire into individual or departmental work practices*

*This project does not seek to gather opinions on specific ICT software or hardware packages used within College*

*This project does not seek criticism of areas of central College departments.*

Participants are to be selected from the non-academic administrative support staff of Trinity College Dublin.

If you agree to participate, this will involve answering a list of questions as part of an anonymous survey on how Administrative Staff utilise Information Systems to adapt and develop their role as support staff in Academia. This will be an online survey that will take approximately 10 minutes to complete.

My research may benefit all administrative staff in third level educational institutions as the research hopes to gain a greater insight into the range of knowledge and utilisation of IS systems among non-academic administration staff; their motivation to accept and adapt to future ICT applications to complete their work and to judge if training / further education is linked to career prospects and Continuous Professional Development.

Any information which I obtain from you during this research will be treated with full confidentiality and that, if published, anonymity will be ensured.

I will store information on encrypted USB storage devices that are password protected. Backup copies of all relevant information will also be password protected.

If you have any questions about this research you can contact me at jlee5@tcd.ie . You are also free, however, to contact my supervisor to seek further clarification and information (Dr Denise Leahy denise.leahy@tcd.ie ).

**DECLARATION:**

I confirm that I will (where relevant):

- Familiarize myself with the Data Protection Act and the College Good Research Practice guidelines http://www.tcd.ie/info_compliance/dp/legislation.php;
- Tell participants that any recordings, e.g. audio/video/photographs, will not be identifiable unless prior written permission has been given. I will obtain permission for specific reuse (in papers, talks, etc.)
- Provide participants with an information sheet (or web-page for web-based experiments) that describes the main procedures
- Obtain informed consent for participation
- Should the research be observational, ask participants for their consent to be observed
- Tell participants that their participation is voluntary
- Tell participants that they may withdraw at any time and for any reason without penalty
- Give participants the option of omitting questions they do not wish to answer if a questionnaire is used
- Tell participants that their data will be treated with full confidentiality and that, if published, it will not be identified as theirs
- On request, debrief participants at the end of their participation (i.e. give them a brief explanation of the study)
- Verify that participants are 18 years or older and competent to supply consent.
- If the study involves participants viewing video displays then I will verify that they understand that if they or anyone in their family has a history of epilepsy then the participant is proceeding at their own risk
- Declare any potential conflict of interest to participants.
- Inform participants that in the extremely unlikely event that illicit activity is reported to me during the study I will be obliged to report it to appropriate authorities.
- Act in accordance with the information provided (i.e. if I tell participants I will not do something, then I will not do it).

Signed:.....Date:.....

*Research Student*

## Appendix B: Declaration of Interest

# Trinity College Dublin: Declaration of Interest Form

(Information provided on this Form may be accessed under the Freedom of Information Act)

As part of the College's good research policy an obligation is placed on the recipients of research grants to declare any interest that would interfere with or compromise the performance of research supported by the grantor. Declarations of interest of all participants or proposed participants in research must be disclosed at the time of contract acceptance. Declaration of interest extends to the researcher or his/her partner or members of his/her family or the research grouping with which the researcher has an employment relationship has an interest. An apparent conflict of interest exists when an interest would not necessarily influence the researcher but could result in the researcher's objectivity being questioned by others. Intentionally failing to reveal a known interest will be regarded as research misconduct and may be subject to disciplinary action.
Please note that this Declaration of Interest may be accessed under the Freedom of Information Act.
Where a conflict of interest appears to have been revealed the University may need to consult with the grantor to ensure that the conflict of interest does not compromise the research funded by the grantor.
It should be stressed that the existence of a conflict of interest does not automatically disqualify a researcher from participating in an award.
There are different types of conflict of interest. For example the following list, which is not exhaustive, is provided for your guidance.

1. A current proprietary interest in a substance, technology or process (e.g. ownership of a patent), considered in or otherwise related to the subject matter of the research

2. A current financial interest, e.g. shares or bonds, in a commercial entity with an interest in the subject of the research (shares > 10,000 Euro except share holdings through
general mutual funds or similar arrangements where the expert has no control over the selection of shares)

3. Positions such as employment, consultancy, directorship with current or expected financial remuneration with any commercial entity which has an interest in the subject matter
related to the research contract. Consultancy is defined as professional activity related to the
person's field or discipline, where a fee-for-service or equivalent relationship with a third party exists

4. Performance of any paid work or research during the past 4 years commissioned by an organisation with interests in the subject-matter of the research endeavour. Also included is any other non funded interest in such an organisation with interests in the subject-matter of the research endeavour during the past 4 years.

5. With respect to the above, an interest in a competing substance, technology or process, or an interest in or association with, work for or support by a commercial entity or organisation having a direct competitive interest should similarly be disclosed.

**Title of Research Project:**
'Administrators in Academia: Utilising ICT to adapt and develop support staff roles'.

**Researcher's Name:** JUDITH LEE

**Declaration:**

Have you or your partner/family and/or research group any financial or other interest in the subject matter of the research in which you will be involved, which may be considered as constituting a real, potential or apparent conflict of interest? If **yes** give details in the space below.

**Answer: YES**

**Type of Interest:**. Employment in Trinity College Dublin as a non-academic administrator.

I, the undersigned investigators, do hereby declare that I am familiar with the College's Code of Good Research Practice and in particular with the section on conflict of interest. I believe that, to the best of my knowledge, accepting the grant/conducting this research mentioned above through the University of Dublin, Trinity College does not involve me in any conflict of interest. I am also aware that if during the course of this research project any conflict of interest arises I will undertake to inform the University as expeditiously as possible and understand that the University may choose to inform the grantor. I hereby declare that the disclosed information is correct and that no other situation of real, potential or apparent conflict of interest is known to me.

Name(s): JUDITH LEE

Signature(s):

Date:

Witness to the Signatures:

## Appendix C: Survey Questionnaire on Survey Monkey

Researcher: Judith Lee, School of Computer Science and Statistics.

You are invited to participate in this anonymous research project which is being carried out by Judith Lee as part of a dissertation in the Taught Masters Programme M.Sc. in Management of Information Systems in the School of Computer Science and Statistics, Trinity College Dublin.

The survey is seeking the anonymous views of staff who work in administration about IS systems and whether they obtain knowledge of new ICT applications to improve their day to day work experience or as part of a career plan.

Anonymity is required of all responses given by participants and care will be taken that any revealing information mistakenly given will be edited to ensure anonymity.

Your participation is voluntary.

This survey that will take approximately 10 minutes to complete.

INFORMED CONSENT FORM

LEAD RESEARCHER: Judith Lee

BACKGROUND OF RESEARCH:
The study is designed to investigate how Administrative Officers; Senior Executive Officer & Executive Officers utilize Information Systems to adapt and develop their role as support staff in Academia. My research may benefit all staff who work in administration in third level educational institutions as it is hoped to gain a greater insight into the range of knowledge and utilization of IS systems among staff who work in administration; their motivation to accept and adapt to future ICT applications to complete their work and to judge if training / further education is linked to career prospects and Continuous Professional Development.

PROCEDURES OF THIS STUDY: If you agree to participate, the anonymous online survey will consist of list of questions that will take approximately 10 minutes to complete. The survey will be conducted for 3 weeks only. Individual results will be aggregated anonymously and research reported on aggregate results.

PUBLICATION: Results of the research will form part of a dissertation for the Taught Masters Programme M.Sc. in Management of Information Systems in the School of Computer Science and Statistics, Trinity College Dublin. This dissertation will be submitted to School of Computer Science and Statistics in September 2013.

DECLARATION:
• I am 18 years or older and am competent to provide consent.
• I have read, or had read to me, a document providing information about this research and this consent form. I have had the opportunity to ask questions and all my questions have been answered to my satisfaction and understand the description of the research that is being provided to me.
• I agree that my data is used for scientific purposes and I have no objection that my data is published in scientific publications in a way that does not reveal my identity.
• I understand that if I make illicit activities known, these will be reported to appropriate authorities.
• I understand that I may stop electronic recordings at any time, and that I may at any time, even subsequent to my participation have such recordings destroyed (except in situations such as above).
• I understand that, subject to the constraints above, no recordings will be replayed in any public forum or made available to any audience other than the current researchers/research team.
• I freely and voluntarily agree to be part of this research study, though without prejudice to my legal and ethical rights.
• I understand that I may refuse to answer any question and that I may withdraw at any time without penalty.
• I understand that my participation is fully anonymous and that no personal details about me will be recorded.
• I understand that if I or anyone in my family has a history of epilepsy then I am proceeding at my own risk.
• I have received a copy of this agreement.

Statement of investigator's responsibility: I have explained the nature and purpose of this research study, the procedures to be undertaken and any risks that may be involved. I have offered to answer any questions and fully answered such questions. I have declared my conflict of interest as a TCD staff member. I believe that the participant understands my explanation and has freely given informed consent.

RESEARCHERS CONTACT DETAILS: jlee5@tcd.ie

PARTICIPATION: If you wish to participate, click 'NEXT' below. If you do not wish to participate, click 'Exit this survey' at the upper right corner of your web browser.

By Clicking 'NEXT', you consent that you are willing to answer the questions in this survey

**1. Describe your level of IT knowledge**

- ◯ Beginner
- ◯ Intermediate
- ◯ Advanced

**2. What is your gender?**

- ◯ Female
- ◯ Male

**3. Which category below includes your age?**

- ◯ 18-20
- ◯ 21-29
- ◯ 30-39
- ◯ 40-49
- ◯ 50-59
- ◯ 60 or older

**4. What educational awards have you gained?**
**Please choose any that apply.**

- ☐ Leaving Certificate
- ☐ Post Leaving Cert Diploma
- ☐ Primary Degree
- ☐ Post Graduate Diploma
- ☐ Masters Degree
- ☐ PhD

Other (please specify)

**5. How many other administrative staff work in your office or immediate section?**

- ◯ None, I am the only administrative person in my office
- ◯ 1- 2
- ◯ 3 or more

## ICT EQUIPMENT IN THE ADMINISTRATIVE DOMAIN

**6. Do you use any of the following ICT equipment in your office? Please choose all that apply.**

- [ ] PC
- [ ] Laptop
- [ ] Smart Phone
- [ ] iPad
- [ ] Networked Scanner
- [ ] Networked Photocopier

Other (please specify)

**7. How is information stored in your work area? Please choose all that apply.**

- [ ] Paper files / Folders / Archives Boxes
- [ ] Index cards
- [ ] Micro Fiche / Micro film
- [ ] CD / DVD
- [ ] PC hard drive only
- [ ] External Hard Drive
- [ ] USB flash drive / Memory sticks
- [ ] Cloud storage

Other (please specify)

**8. How old is your current desktop PC or Laptop?**

- ◯ Less than 1 year
- ◯ 1-2 years
- ◯ More than 3 years

**9. Have you ever suggested upgrading of any ICT equipment in your office?**

◯ YES

◯ NO

If 'YES' please give more details

## IS TRAINING

**10. Have you ever attended any of the following training courses offered by IS services?**

**Please choose all that apply.**

- [ ] Microsoft Word
- [ ] Microsoft Excel
- [ ] Microsoft Access
- [ ] Microsoft Powerpoint
- [ ] Dreamweaver
- [ ] Photoshop
- [ ] Survey Monkey
- [ ] Pod-cast

Other (please specify)

**11. What motivated you to attend any IS training course?**

**Please choose any that apply.**

- [ ] To learn a new IS skill
- [ ] To update IS skills
- [ ] On suggestion of my Head of Area
- [ ] In planning for future career
- [ ] Training course was mandatory

Other (please specify)

**12. Have you ever attended an IS course based outside of College?**

- ◯ YES
- ◯ NO

If YES, please give details

**13. What motivated you to take any external IS course?**

- ☐ To learn a new skill
- ☐ To update IS skills
- ☐ On suggestion of my Head of Area
- ☐ In planning for future career
- ☐ Training course was mandatory

Other (please specify)

## HR STAFF DEVELOPMENT

**14. Have you attended any HR Staff Development programmes in College? Please give name of programme / programmes attended.**

**15. What motivated you to attend any HR Staff Development programme? Please choose all that apply.**

- [ ] To discover my Administrative strengths
- [ ] On suggestion of my Head of Area
- [ ] To help deal with office dynamics
- [ ] In planning for future career
- [ ] Programme was mandatory

Other (please specify)

**16. The '2011 Action Plan on Adult Learning: Ireland' published on behalf of the EU Commission focused on**
**"greater attention to ICT and e-learning for development of lifelong learning".**

**How important are new ICT skills and e-learning for staff who work in administration as part of a lifelong learning plan?**

| | Not Important | Slightly Important | Important | Extremely Important |
|---|---|---|---|---|
| 'Learning New ICT Skills | ◯ | ◯ | ◯ | ◯ |
| E-Learning | ◯ | ◯ | ◯ | ◯ |

Other (please specify)

**17. Continuous Professional Development (CPD).**
**Do you feel that updating of ICT skills contributes to the development of your professional career as member of the non-academic support staff of a University?**

- ◯ Strongly disagree
- ◯ Moderately disagree
- ◯ Neutral
- ◯ Moderately agree
- ◯ Strongly agree

## TECHNOLOGY READINESS

**18. How willing are you to embrace new ICT technologies?**
**Please choose any that may apply.**

| | YES | NO | NEUTRAL |
|---|---|---|---|
| You prefer to use the most advanced ICT technology available | ◯ | ◯ | ◯ |
| Technology makes you more efficient in your occupation | ◯ | ◯ | ◯ |
| You find new technologies to be mentally stimulating | ◯ | ◯ | ◯ |
| Learning about technology can be as rewarding as the technology itself | ◯ | ◯ | ◯ |
| Other people come to you for advice on new technologies | ◯ | ◯ | ◯ |
| You find you have fewer problems than other people in making technology work for you | ◯ | ◯ | ◯ |

Please give your comment

## TECHNOLOGY ACCEPTANCE

**19. What is your opinion on the effect of Information Systems on your administrative work?**

**Please choose any statements that apply.**

| | DISAGREE | AGREE |
|---|---|---|
| Information Systems enable me to accomplish tasks more quickly | ◯ | ◯ |
| Using Information Systems improves my job performance | ◯ | ◯ |
| Using Information Systems increases my productivity | ◯ | ◯ |
| Using Information Systems enhances my effectiveness on the job | ◯ | ◯ |
| Using Information Systems makes it easier to do my job | ◯ | ◯ |
| Overall, I find Information Systems useful in my job | ◯ | ◯ |
| Learning to operate Information Systems is easy for me | ◯ | ◯ |
| I find it easy to get Information Systems to do what I want it to do | ◯ | ◯ |
| I find Information Systems awkward to use | ◯ | ◯ |
| It is easy for me to remember how to perform tasks using Information Systems | ◯ | ◯ |
| Overall, I find it easy to use Information Systems | ◯ | ◯ |

## END OF SURVEY

1. Title of Project:

'Administrative staff in Academia: Utilising ICT to adapt and develop support staff roles'.

2. Purpose of project:

This anonymous research hopes to gain a greater insight into the range of knowledge and utilisation of IS systems among non-academic staff who work in administration; their motivation to accept and adapt to future ICT applications to complete their work and to judge if training / further education is linked to career prospects and Continuous Professional Development.

Thank you for taking part in this survey and giving your time to answer the questions.

If you require any further information, please contact me at jlee5@tcd.ie .

Thank you again.

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