"Exploring the Difficulties Facing the Retention of Women in the IT Sector in Ireland"

Caroline Thornton

Masters in Human Resource Management

National College of Ireland

Submitted to the National College of Ireland, September 2015

Submission of Thesis and Dissertation

National College of Ireland

Research Students Declaration Form

(Thesis/Author Declaration Form)

Name: CAROLINE THORNTON

Student Number: 13101935

Degree for which thesis is submitted: MA HRM

Material submitted for award

(a) I declare that the work has been composed by myself.

(b) I declare that all verbatim extracts contained in the thesis have been distinguished by quotation marks and the sources of information specifically acknowledged.

(c) My thesis will be included in electronic format in the College Institutional Repository TRAP (thesis reports and projects)

(d) ***Either*** *I declare that no material contained in the thesis has been used in any other submission for an academic award.

Or *I declare that the following material contained in the thesis formed part of a submission for the award of

_____

(State the award and the awarding body and list the material below)

Signature of research student: _____

Date: 2/9/15

ABSTRACT

The research presented investigates the relationship between gender and retention rates within the IT field. With pressure to maintain talent pool levels from existing MNC's located here, if Ireland aims to sustain its competitive economic edge in IT then existing global literary evidence of female IT retention rates must be explored. The abundance of global literature researching issues facing IT female retention rates helped shape this study to focus on the Irish perspective, of which existing studies are lacking.

In an attempt to investigate the factors influencing Irish IT retention rates, the author adopted a deductive approach to this study and attempted to prove or disprove assumptions based on the literature researched. In accordance with the literature, a quantitative approach was employed using an online questionnaire. This was created using existing scales and also additional optional open questions. The online questionnaires were collated and analysed using SPSS. 65 respondents resulted in no statistically significant difference between employees views of their company's work-life balance policies or their JS. This indicates there is no difference between gender and intent to exit the industry. This finding contradicts research carried out by academic scholars. A more comprehensive analysis with a more reliable scale and longer time frame would be recommended in order to assess the retention rates of IT professionals in Ireland.

ACKNOWLEDGMENTS

I would like to express my deepest gratitude to all of those who contributed in any way to the completion of this research.

- Firstly, I wish to thank my supervisor Rebecca Maguire for her much needed guidance, advice and support.
- I would also like to thank Jonathan Lambert in NCI for sharing his SPSS knowledge and for his patience.
- I am grateful to all those participants who responded to the survey and who helped shape this research. Without their willingness to help and interest in this topic, this research would not have been possible.
- To my friends, for taking the time to listen and helping to the fullest of their abilities. In particular, Sarah Rose for her unwavering support.
- Last but by no means least, my eternal gratitude goes to my supportive family. Their continued support is invaluable to me. On a personal note, my father for his advice and keen eye, my mother for her every helpful word of support when they are most needed, Lynsey for being the inspiration behind this research and Paula who provided countless help she provided me along the way. This dissertation is dedicated to you.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

STEM – Science, Technology, Engineering and Mathematics

IT - Information Technology

JS -Job Satisfaction

WFC – Work Family Culture

CHPATER ONE

INTRODUCTION

Research Context

The global technology fields are continually growing leading to the increased growth of jobs within the IT sector. The Irish government has recognised this pattern and has strategically focused on the education and generation or suitably qualified staff for the IT sector in the past twenty years (Black, Jameson, Komoss, Meehan and Numerico, 2005). Ireland is globally recognised for its low corporation tax resulting in a competitive edge for Multi National Corporation's (MNC) locating their European offices here. The supply of a well educated workforce in Ireland leads many IT MNC's to locate here also with companies such as Google, Facebook, Intel, EBay and LinkedIn having established European head offices in Ireland. Successful retention of staff is critical to sustaining the required workforce.

In 2012, 29.8% of the Irish Information and Communication workforce were women while the EU average was 31.5%, indicating not only a low figure of female IT professionals in Ireland but low compared to our EU counterparts (CSO, 2013b). However a decade previous in 2002, Ireland had almost double the representation of female employment in IT compared to those in the UK and Germany (Black et al., 2005). The economic recession and national economic policies implemented during this time may have lessened the female Irish employment within the IT field. However, while MNC's continued to invest in Ireland throughout the recession, this below EU average underrepresentation of women is worrying to the momentum and continuation of the Irish IT sector growth. With Ireland's IT sector accounting for €70 billion per annum, any factor threatening Ireland's competitive edge in the global IT sector must be addressed (Department of Jobs, Enterprise and Innovation, 2014).

Recent Northern American studies have indicated women continue to display low retention rates, within the science, technology, engineering and mathematics (STEM) fields (Simard and Gilmartin, 2010; Ryan and Harden, 2014; Michie and Nelson, 2006). A study carried out by Glass, Sassler, Levitte and Michelmore (2013) found that 50% of women who entered STEM industries were still in employment after 12 years. The same comparative study showed that women working in STEM fields are overall more likely to leave employment rather than women in non-STEM fields for reason regardless of JS levels, age and education (Glass et al., 2013).

The American literature investigating female retention rates within the IT fields is worth investigating from an Irish perspective considering the investment that has been made in IT education. Although not specifically prioritising females, the education promoted by the Irish government to furthering high tech industries presence in Ireland is based upon the support and availability of the workforce. The purpose of this research study would be to identify barriers to retaining female employees in the IT industry in Ireland. The research question is "What factors influence the retention rates of employees in the Irish IT sector?" The proposed methodology to study this question and its subsequent sub-objectives will have a quantitative focus. The research will be performed through questionnaires answered by a sample of women and men in the STEM sector pertaining to the variables in question.

Research Aim and Methods

The purpose of this research is to investigate the factors which impact retention rates of female and male employees in the IT sector in Ireland. The current study used an online questionnaire to explore the relationship between gender and retention rates in the Irish IT field. The study addressed these objectives by utilising existing verified scales for both JS and work-life balance scales. The data was collected via online questionnaire and then analysed using the data analytics program SPSS. The research intends to show that there is a difference in intent to exit employment between female and male employees in the Irish IT sector and the factors influencing the intent.

This research first investigated previous literature which is essential in developing the areas of research to be addressed. This is addressed within Chapter Two and provides an overview of published literature which helps frame the research. The researcher investigates existing literature relating directly to the issue of female retention issues within STEM but considers environmental impacts, career progression and work-life balance among others. Having examined the relevant literature and deduced certain factors to analyse further, the research question itself is discussed in Chapter Three whereby the aims and objectives are stated also. Chapter Four explains the methodology employed in order to appropriately investigate the research. Following on, Chapter Five details the Findings and Analysis upon collection of the data. Tables and figures help explain these findings which are later discussed, referring to the literature studied in Chapter Six with limitations of this research noted. Finally, Conclusions and Recommendations are reflected upon within Chapter Seven providing a summary of the research as well as future recommendations.

CHAPTER TWO

LITERATURE REVIEW

The value of retaining employees is widely understood as positively impacting companies across the board. The company's duty to best understand its retention rates can save on financial costs as well as indirect costs. There are several causes for employees exiting the company which include organisational culture, communication, strategy, work-life balance polices and career development systems (Sinha and Sinha, 2002). The aim of the literature review is to understand the current studies related to the general area of women's retention rates within the IT sector. Researchers studying the retention rates of women in the IT sector primarily focus on more than one of the STEM industries. A correlation exists within these four industries that have verified low retention rates of female employees across the board and female employees experiencing low progression rates past 35-40 has been indicated although remains ambiguous (Appelbaum, Asham and Argheyd, 2011a; Glass et al., 2013). There is a lack of literature related to the relationship between age, gender and retention.

This is a gender issue facing the global IT sector as females underrepresentation has been noted globally including Canada, America, India, Italy, Netherlands, Germany, Australia, the UK and Ireland (Trauth, Quesenberry and Huang, 2008; Black et al., 2005; Hall, 2010; Heilbronner, 2013; Rosenthal, London, Levy and Lobel, 2011; Dimitriadi, 2013). Underrepresentation in undergraduate STEM courses have been recognised as a persistent global issue (McCoy and Smyth, 2011; Whitney, Gammal, Gee, Mahoney and Simard, 2013). Much research exists focusing on the barriers female employees face advancing their careers within the STEM field and on the retention rate of women practicing in STEM, however only two focusing on Ireland were available. These two studies by Cross and Linehan (2006) and Cross (2010) investigate the promotional opportunities, or lack thereof, for women working in IT. There is a gap in the research as these Irish studies do not look into the retention issues arising from the social glass ceiling presented in Ireland. Retention is an issue which most organisations strategise to reduce levels of voluntary employee exits. The financial impact of which are a strong factor to consider.

Cost of Turnover

Retention and turnover are very closely linked concepts. Retention relates to the attempt to preserve present employees within the company/field whereas turnover relates to ratio in which the company loses and gains employees. Both deal with the loss of staff however turnover also accounts for the subsequent taking on of staff whether it is as a replacement or filling new positions. Turnover is an expensive process which experiences 'direct costs (replacement, recruitment and selection, temporary

staff, management time), and ... indirect costs (morale, pressure on remaining staff, costs of learning, product/service quality, organisational memory) and the loss of social capital' (Morrell, Loan-Clarke and Wilkinson, 2004, p 161). The costs of turnover are difficult to measure as direct and indirect costs are certainly an effect, however MacKay (2007) states that the cost of turnover is 2.5 times that of the individual's annual salary. It is in the company's best interest, both on a financial and morale level, to retain valuable employees through investigating reasons behind the employees exit and tackling these reasons proactively.

Retention Rates in STEM

As mentioned in the introduction, STEM fields are known for having low female employment from the outset, but are the retention rates lower than those in other non-STEM fields when this is coupled with lack of progression opportunities, lack of female role-models within the industry/organisation, family commitments and their resulting stress levels? Although women may be interested in technology from a young age, even progressing into completing a third level qualification in technology, it is suggested that women still choose a non-STEM career path (Ashcraft and Blithe, 2009). Glass et al. (2013) investigated whether retention levels differed between STEM female employees and non-STEM female employees. They found that although women in STEM fields appeared to have higher wages, better work-life amenities such as flexi time and remote working, and greater JS then their non-STEM counterparts, women in STEM had a lower retention rate with many leaving for a non-STEM profession or leaving the work force altogether (Glass et al., 2013). Although the sample used in this study were women currently mid careers, women in Generation Y, current graduates born during 1982-1990, may experience different results which should be coming near to investigating soon.

While IT is known for high turnover rates in general demonstrating a 'turnover culture', women's rates have been highlighted within the field as a cause for concern over male retention rates (Quan and Cha, 2010; James and Mathew, 2012). In a study carried out by the Center for Work-life Policy, approximately three quarters of the women working in technology studied stated 'loving their work' but yet it is noted that 56% of women choose to leave the technology field midcareer, in this case referring to when the women have accumulated between 10-20 years of experience in the industry (NCWIT, 2009; p.11). 51% of those that choose to leave the industry or organisation do not utilise their training during their 10-20 years worth of experience (NCWIT, 2009). This same study also shows that women leave technology at a higher rate than women in science or engineering (NCWIT, 2009). Another study carried out by Glass et al., (2013) mentioned that they found the lowest rates of retention to be after 5 years of employment in the field. Typically this would occur up to the age of 30, which is typically an acute period in terms of family commitments. Glass et al. (2013) attribute

this stage of attrition to the traditional management negative attitudes to female participation in STEM fields and lack of support using the work-life amenities on offer. This is contradicted by the previous research carried out by NCWIT (2009) where women are shown to leave after 10-20 years of work experience within the field, of which only 49% remain using their industry experience. Work-life balance has been widely acknowledged as causing women to exit the workforce or avail of work-life balance policies to balance their life aspirations and so, spanning 15 years of a woman career and life, findings that suggest family commitments is not a strong cause for exiting the IT field requires further research and more specific reasons being investigated to understand this suggested timeframe.

Studies indicate women who have left the STEM field, who are highly educated and trained in STEM and who 'have confidence' in their work and skills are apprehensive to return to their careers due to 'formidable obstacles' (Mavriplis, Heller, Beil, Dam, Yassinskaya, Shaw and Sorensen 2010, p.150). These obstacles were mentioned to include industry culture, work-life issues and skills gap since their departure. An existing global shortage of IT skills has inevitably led to a war for talent in the sector (Oireachtas, 2013). This global war for talent magnifies Ireland's need to improve retention rates of women within IT as their migration to different fields of work or leaving the workforce altogether hinders the Irish IT capacity to compete internationally. The retention issue should be targeted prior to departure of the female employee as they may be apprehensive to return to the IT workforce in fear of the leaps in technology as evident in the study by Mavriplis et al. (2010).

Retention Strategies

As mentioned, retaining the right staff is highly beneficial to organisations. Companies who wish to decrease potential future direct and indirect costs which low retention rates incur should actively promote retention strategies companywide. This will aid JS of employees and thus their intent to remain within the company. Such strategies to enhance employee attachment should incorporate empowerment and flexibility in order to provide a win-win option for women in terms of succeeding in both work and family spheres simultaneously (Taneja, Pryor and Oyler, 2012). This would also provide a win-win option for employers as well as these strategies will 'support increased productivity and innovation, employee satisfaction and retention' (Taneja et al., 2012, p.48). Indeed work-life balance procedures including the likes of flexible working hours is such a strategy targeted at both male and female employees.

Work-life Balance

Women who are career driven have been known to delay or avoid notions of beginning a family in order to progress independently (Glass et al., 2013; Simard and Gilmartin, 2010). If/when such a time arises, an Australian study carried out by Reynolds and Aletraris (2007) found that reducing working hours was the most popular form of coping with work-life conflicts in use by women who had children younger than 6 years old (as cited by Appelbaum et al., 2011a). The increased importance of work-life balance for women is noted in all fields. Although men could benefit from the work-life balance policies offered in the workplace women appear to be the main patrons as few men have been found to avail of them (Cross and Linehan, 2006). This is certainly viewed as a disadvantage to the progression of women as they are unable to commit as many hours as their male counterparts. This is further perpetuated by research which has shown that those who experience difficulties balancing work and family spheres experience 'stress, turnover, promotional barriers and discrimination' (as cited in Armstrong, Nelms, Riemenschneider and Reid, 2012).

Interviewees in a study carried out by Cross and Linehan (2006) found the low uptake of work-life balance polices of male employees compared to their female counterparts to accentuate the stereotypical view of a 'married male manager as an asset, with a stable support network at home allowing him to give his undivided attention to his work, but they view the married female manager as a liability, likely to neglect her career at the expense of her family' (p.38). It has been suggested those women who delay marriage and children are 'reinforcing the perception that to make it in this [STEM] field a woman cannot be successful and raise a family at the same time' (Mavriplis et al., 2010, p.141). Similar reasons have been noted, such as the woman's delay in having children could be as a result of advancing their career development opportunities before any possible work-family conflicts may occur (Armstrong at al., 2012). Organisational perceptions like these socio-cultural stereotypes are disastrous to women striving to accomplish success in both work and family spheres.

There is evidence of increased stress levels caused by women juggling their career and family commitments simultaneously (Appelbaum, Asham and Argheyd, 2011b). There is a risk of underperforming on either or both platforms while attempting this balancing act which threatens both platforms as a result. The search for the equilibrium of work-life in Ireland has benefitted from legislative policies becoming nationally implemented, however Cross (2010) revealed this positive initiative failed to benefit many women as companies failed 'to create an organisational climate which is more 'female-friendly'' (p.115). This would inevitably promote a perception that utilising work-life amenities negatively affects your career prospects due to company culture. This is further defended by a study carried out by Glass et al. (2013) which indicates that the career choices of the female participants who left the STEM field was not impacted by marital status or children but may have been correlated with industry/company culture in terms of availing of work-life amenities.

Work-life balance policies may not be the dominant factor influencing retention rates of female IT employees. Other factors such as the 'glass ceiling' effect must be acknowledged.

Women's Career Progression

Career development programmes not only provide employees with a career progression structure in which they can envisage themselves developing in that company, but also generates savings for the company as promoting internally has been proved to be less expensive than recruiting externally (Sinha and Sinha, 2002). Providing a clear career progression pathway for the employee to follow allows the employee to manage expectations and demonstrates the aspirations which management are offering them. Women continue to be underrepresented within positions of power (Armstrong et al., 2012). With only 20% of women holding management positions worldwide, any implemented career development programme doesn't appear to be successful (Hunt, 2015).

The absence of promotional opportunities within an organisation can be stifling for employees who have drive to further their career internally. However could the failure of women to secure promotions over men be a corner stone of a lack of employee engagement in women? In a recent study Appelbaum et al., (2011a) researched these issues and found alternating plausibilities relating to the glass ceiling experienced by women within the IT sector. Their study found those female IT employees who have not been promoted in approximately over ten years have no aspiration of receiving a promotion in the coming years, while those holding the same position for five years or less expected a promotion within a year or two (Appelbaum et al., 2011b). These finding highlights the longer a female employee remains in the same position may cause demotivation in personal career progression within the field. It has also been negatively suggested that the use of work-life policies can highlight the stereotypical perception that 'women don't have time to devote to management' as well as the informal approach taken by management when selecting employees for promotions (Cross and Linehan, 2006, p.37).

The age of women was found to be a factor affecting continued progression. It is suggested by Moss-Racusin, Davidio, Brescoll, Graham and Handelsman (2012) that men are understood to be more capable in STEM, therefore recommended for mentoring and paid higher by management then their female counterparts within the early stages of their careers (as cited in Glass et al., 2013). However this is contradictory when related solely to the engineering field as Simpson and Altman (2000) found that women tend to reach more senior levels then men do, although this appears to occur under the age of 35 for women (as cited in Appelbaum at al., 2011a).

Women have acknowledged networking with senior management as a powerful tool to further personal career progression (Quesenberry and Trauth, 2012). Networking plays a crucial role in the assessment of employees for promotional opportunities sometimes even surpassing education or experience in the process (Simard and Gilmartin, 2010). Women have experienced a lack of opportunities to partake in social networking, which is viewed negatively in terms of career advancement (Simard and Gilmartin, 2010).

Diversity

'Managing diversity comprises taking advantage of diversified experience, knowledge, skills, predispositions, and sensitivity (purely professional, but also cultural) within the entire organisation' (Durska, 2009, p.36). Diversity is often encouraged in companies as an employee with a different point of view can often provide valuable insight to a project. This practice incorporates all forms of diversity, including gender, and minorities. Women would be included within the umbrella term of diversity within the IT field as it is male-dominated. These policies, where equal opportunities are promoted and diversity is used a tool, has been proven to aid employee perception of the organisation which has shown a reduction in employee turnover (Groeneveld, 2010).

As the IT field is largely team based, women who are involved within IT will help make 'scientific research more vigorous and complete' by offering their diversified opinion to the table (as cited in Shapiro and Sax, 2011). This can be assured through affirmative action whereby minority groups are actively recruited or promoted to provide this diverse element to the organisation. However this has been criticised as promoting a 'victim mentality' and also devaluing free enterprise by hiring those who might not necessarily be the most qualified for the position due to their gender or cultural background (Syed and Kramer, 2009, p.642).

Mentoring is another form which offer women a better opportunity for advancement or retention. Encouraging diversity management within the IT field as whole may greatly impact women's retention rates as 'all employees in the company have the sense of belonging to the same team and contributing their unique experience, skills and knowledge' (Durska, 2009, p.40). This sense of belonging should challenge the male-dominated perception in an attempt to make women feel equal to their male peers.

Industry Role-Models

Women have been experiencing high levels of isolation within STEM fields and has been noted that more encouragement and mentoring is needed for females (Vogt, Hocevar and Hagedorn, 2007). A study investigating women's retention rates in the engineering field found that providing a mentoring programme in college had high inclinations for increasing retention rates of female students (Poor and Brown, 2015). In order to combat the female's sense of isolation within the male dominated engineering course, having access to female role models would provide a necessary avenue where female students can feel supported and driven to follow a career within STEM. This is an intervention tactic designed to boost female morale within the company or industry and to generate a positive stereotype of women working within STEM.

Female role-models prove more effective in retaining female employees as they provide a mentor who has overcome 'negative stereotypes that cast doubt on their abilities to perform well' in STEM (Drury et al., 2011, p.265). Same-sex role models would be a beneficial strategy in order to reduce female employees exiting the field. This must actively be encouraged by all senior management in order to attempt to balance the gender over-representation within the male dominated field. Management should also be aware of not overloading this responsibility on the female staff that are available.

Gender Perceptions and Social Influences

There was no literature detailing the motivations behind initially choosing the STEM field, however one can assume it is due to their academic interests and abilities (Smith, Lewis, Hawthorn and Hodges, 2012). These interests and abilities can be challenged by societal, environmental, educational and familial factors. There is a wealth of research available indicating that these factors have an enormous influence on women's involvement in the STEM fields (McGrath Cohoon, Wu and You, 2006; Smith et al., 2012). These perceptions or stereotypes have a knock-on effect on the amount of women advancing through the educational fields and eventually progressing into the work industry. Often women have been found to adapt to the male-dominated culture by minimising their female characteristics and adopting a 'one of the boys' mentality in order to progress (Rhoton, 2011). This is a coping mechanism to assimilate into their surroundings while girls have been influenced to think that boys are better at maths, therefore girls are bad at maths (Smith et al., 2012). Women have been conditioned to believe this misconception from a young age and this has progressed throughout their educational experience as the number of women studying STEM drops per educational stage. Self-perception is vital in order to succeed and these environmental perceptions permeating from society has had a detrimental effect on the number of women in the IT field (McGrath Cohoon et al., 2006).

Society has a deeply embedded impression on what a woman's role entails, whether it involves sacrificing a career in order to raise a family or targeted at society's perception of the woman's role in terms of having a career within the STEM field in general. Rosenthal et al. (2011) understand this perceived lack of compatibility between gender and 'STEM identity can be a significant impediment to sustained achievement and engagement in pursuing a STEM career for women over time' (p.727). As STEM is a predominately male-dominated field, 'women attribute poor performance to a lack of their underlying ability' (as cited in Smith et al., 2012, p.132). As Dimitradi (2013) notes 'Gender stereotyping will affect not only the career choice of girls, but also their professional development where more barriers will be encountered' (p.7). Understanding women's self perceptions and the social support available to them can help encourage their desire to pursue a career in STEM (London, Rosenthal, Levy and Lobel, 2011).

Educational Impacts

Many scholars have noted the decline of women partaking in STEM from secondary school through to the STEM workforce (Smith et al., 2012; London et al., 2011). This has become known as the leaking pipeline which affects women in STEM (Smith et al., 2012). This leaking pipeline shows that it is not only the STEM industry culture which affects the amount of women participating but it is also influenced by the educational support.

In school years, choosing maths and science as subjects are the foundation for progressing to the STEM field in later years. This period within a child's life is influential to their potential STEM aspirations and it has been suggested that 'self-beliefs and task beliefs are critical precursors of these high school choices' (Simpkins, David-Kean and Eccles, 2006). Career guidance counsellors, teachers and parents all have an impact on the child's perception of the industry as a whole and their place within it. Grades will also have an impact on how capable the child associates themselves with a subject and in turn, an industry. Good grades provide the child with a positive association, accomplishment as well as self-efficacy in that subject. Despite similar test scores in science, less females progress to the STEM career than males (Hunt, 2015).

The underrepresentation of women within STEM college courses can be linked to females recognising these courses as more hostile than their male counterparts (London et al., 2011). These hostile college environments are founded due to females perceptions of less positive contact with their lecturers than their male peers and fewer opportunities for achievement and advancement' (London et al., 2011). There are low retention rates of women progressing after year 1 of their college STEM subjects in the US and this is understood to be as a result of women's feelings of self-doubt, anxiety, discouragement and lack of self-efficacy (Rosenthal et al., 2011). This impacts the female's sense of belonging within

the STEM community as they become acutely aware of these factors. These external societal factors play a significant role in shaping female career prospects from a young age as women are aware of the industry male-dominated culture as well as the misconception that males are academically better in those fields. This perception may lead to women feeling inadequate as they are not innately gifted as their male peers, as society has conditioned them to believe.

The Irish Experience

As mentioned, the underrepresentation of women in the ICT field is a global issue affecting Australia, America, Canada, Germany and the UK (Trauth et al., 2008). Ireland has been discussed in research papers but only two papers appear to focus on the Irish narrative. The percentage of women working in IT has fluctuated over the past decade or so with 31% representing women in IT in 1998 decreasing to 27.5% in 2004 (Trauth et al., 2008). This figure has since risen to 30.2% in 2010 (CSO, 2011) only to drop to 29.8% in 2012 (CSO, 2013b). Women employed in IT is one of the top five industries under representing women with agriculture, construction, transportation among those more highly affected (CSO, 2013b). When women's workforce in IT is compared, Ireland is on average marginally lower than the EU average (CSO, 2013b; CSO 2011). Maintaining the requires skills is crucial for Ireland as it continues to expand its European future investment in the IT sector and signifies that there is an ever growing need for those with IT skills to be retained within the industry.

In 2014 female employment participation was at 55.9% whereas male participation reached 65.7% of the population (CSO, 2013a). Although this does not distinguish between part-time or flexi time employment, the approximate 10% in difference indicates an underrepresentation of the female participation in Ireland compared to men. The growth of the high-tech industry continues in Ireland and so there are available job opportunities for those suitably qualified. Women in Ireland have surpassed men in achieving third level qualifications between the ages of 25-34 (CSO, 2013a). Studies indicate that one third of computer science graduates are female and half of postgraduate students are female (Delaney, Gubbins, Redmond, Harmon and O'Carroll, 2013). This indicates the current generation of women are encroaching on the number of educated males in IT. In 2011, Ireland had 5.2% of its workforce employed within IT field which was 1.5% above the average OECD countries (OECD, 2011). However Ireland is experiencing a skill-gap within the IT fields (OECD, 2013) where there are currently approximately 103,000 people employed by technological companies in Ireland (Irish Software Association, 2014). Recent government initiatives aimed at strengthening Ireland's IT field have seen an increase from 45% to 60% of the industry skills demand catered for by domestic talent (Department of Jobs, Enterprise and Innovation, 2014). The government are actively attempting to reform the way STEM positions, specifically technology based positions, through strengthening mathematics uptake in secondary education as well as promoting

careers within STEM (Department of Jobs, Enterprise and Innovation, 2014). Retention of staff is crucial in order to maintain the workforce levels required with a strong focus primarily on female retention as females have been globally recognised to exit the technology field altogether.

Summary

The main reoccurring themes throughout the literature relating to the retention rate of women working in the Irish IT field focus on gender barriers affecting retention and career progression. The perception of women working in IT seems to differ pertaining to ethnic and cultural backgrounds as well as company culture (Quesenberry and Trauth, 2012). The level of state support and societal support offered to the female workforce, especially once beginning a family, differs from country to country and is likely to affect the perceptions of colleagues. The availability of work-life amenities enables both women and men the opportunity to manage their family lives alongside their careers however the low levels of males benefiting from these amenities reinforces the societal perception that the women are the ones to compromise on their careers in order to care for their families (Cross and Linehan, 2003). As studies suggested, a significant number of women working in STEM fields who are above the age of 35 have been found to change fields or leave the workforce entirely and the age of the women would indicate a correlation to work-life issues (Glass et al., 2013). These factors outlined within the literature have primarily focused on Northern American or UK samples and so there is a lack of empirical research into the Irish IT sector and its impacts on female retention.

It is evident from the literature on this subject that societal factors play a significant role in women's retention rates within the STEM field and these range from school years to entering the workforce. These, often implicit, social attitudes towards the female capacity in maths and science evidentially hinder women from pursuing these subjects later in life as they doubt their abilities compared to the perceived males innate ability. The leaking pipeline has been mentioned as highlighting the environmental factors as a key issue which requires tackling by society, aided by governmental initiates. For the purpose of this research, the researcher is aware that the retention issue of women in IT precede entering the workforce, however the researcher will be focusing on those who have already entered the workforce and investigate whether they have any intentions to leave and their reasons behind this. As one of the leading growth industries in Ireland, it is imperative for Ireland to maintain the required workforce to meet this demand. Preventing women from exiting the industry will be a key factor in this process.

CHAPTER THREE

RESEARCH QUESTION

Research Grounding

As stated within the literature review, the retention of staff is a significant concern to most companies as the cost of an employee leaving the organisation can be very high. This concern is magnified by the ongoing 'war for talent' as the industry continues to grow with start-up IT companies launching and the expansion of established IT companies stressing the need for retention of current employees. The issue of women in STEM having a lower retention rate than their male counterparts has been noted within many North American and European literature. As highlighted in Chapter Two, there is a gap in the literature when referring to any gender IT retention situation focused on Ireland.

Research Aims and Objectives

Upon literary reflection in the area of women in the Irish IT sector, the main aim for this dissertation is to explore the question: 'What factors influence the retention rates of female and male employees in the Irish IT sector?' The researcher explores the range of factors which could contribute to retention rates. In order to investigate this topic further, there are certain sub-objectives which will need to be examined:

- Outline if there is a difference between male and female retention rates and management levels within the IT industry in Ireland.
- Discover whether there is a notable difference between female and male JS levels in IT.
- Determine what effect industry culture, work-life balance and shortage of female role models in the field have as possible causes for the low female retention rates.
- Identify whether women under-35s and over-35s have the same outlook of retaining employment within the IT field.

These sub-objectives help focus the research through investigating the possible impacts on retention. The sub-objectives are derived from an absence within the literature relating to gender within IT in Ireland. Minimal findings were discovered when attempting to establish previous research into the Irish IT sector and the subsequent gender issues arising. More research is required to investigate the IT gender issue facing Ireland and the researcher intends to discover whether gender retention differences occur in Ireland and the reasons for them, as the literature in this field tends to originate from the UK and Northern America. Taking the literary review into account and addressing this

global issue from an Irish perspective will help to illuminate the current war for IT talent and in particular what causes affect this matter in order to maintain the growth of the IT market on Irish soil.

The identified sub-objectives of this research have shaped the following hypotheses:

H1: Different retention rates exist between female and male employees of an IT company in Ireland.

H2: Women in Ireland aged over-35 will have a lower intended retention rate in IT compared to women under-35.

H3: Men hold a higher proportion of senior management roles in IT when compared to women.

CHPATER FOUR

METHODOLOGY

Introduction

The researcher chose a corresponding methodology to compliment the research question. Research is the 'systematic collection and interpretation of information with a clear purpose to find things out' (Saunders, Lewis and Thornhill, 2009, p.600). The methodology will be discussed within this chapter with an understanding of the motives behind each choice. This chapter will explain the methods employed in order to understand the influences affecting staff retention in the IT field in Ireland. Sample group, data collection and data analysis will be justified and the potential limitations of the chosen methodology will be discussed.

Research Philosophy

Based on the literature reviewed investigating retention rates of employees, a mixture of qualitative and quantitative research approaches were selected of which interviews and questionnaires were the primary methodologies employed. The majority of research has adopted a quantitative approach however research was investigated where a qualitative approach was adopted in order to pinpoint the individual's perception of their working environments rather than the quantitative one size fits all approach. Ultimately the researcher found a quantitative method to be the most suitable approach overall as this will be best in gaining an overall understanding of the research. The positivist paradigm focuses on statistical results and this is best suited for the current study. A quantitative approach is typically associated while operating under the positivist paradigm (Collis and Hussey, 2009). The quantitative research method enabled the researcher to do so by quantifying the variables in order to test the hypothesis of this study. This method allows the researcher to assess a larger sample's overall view of the topic in comparison to the qualitative approach.

Research Approach

The methodology employed is deductive to the research objectives. Deductive is the most common view when exploring a research topic and allows the researcher to deduce hypotheses, as mentioned above, based on the literature studied (Bryman and Bell, 2011). Adopting a deductive approach

allows the researcher to form their research question and subsequent hypothesis based on the literature review, therefore the researcher is setting out to prove or disprove these assumptions.

Research Instrument

Cross-sectional questionnaires are certainly the most achievable gathering of data for dissertations, as programmes generally last one year. Any longitudinal study would have been very interesting within this research in order to examine whether any participants acted upon their views of their industry/company a few years previously. However this was not carried out due to time constraints placed on this study and so cross-sectional was necessary. Questionnaires are generally used in order to discover 'how widespread things are' (Rugg and Petre, 2007, p.64). In order to investigate how widespread the hypothesis is that whether or not IT companies in Ireland will have a notably different female retention rate compared to males, the researcher understands a questionnaire as the most appropriate research method to employ. Although questionnaires run the risk of yielding incomplete responses from a sample and provides little opportunities for elaboration responses, however based on the timeframe to complete this study, questionnaires allows for a larger number of participants to be involved in the sample compared to interviews (Levine, Stephan, Krehbiel and Berenson, 2008).

The questionnaire was generated via Google Forms. The questionnaire was distributed via email and Linkedin. The questionnaire was accessed and completed online. Self-administered questionnaires provide a certain level of anonymity to the participants and diminishes the risk of interview bias so may provide a true reflection of the participant's experience (Bryman and Bell, 2011).

Questionnaire Design

These questions were primarily asked to gather demographic information which will further explain the relationships between the dependant and independent variables. The respondents were asked questions pertaining to their gender, age, education and family status among others. The respondents were also asked specific questions relating to their current role also, such as what is industry are they currently working in, how long they are in their current employer and whether their educational qualification is related to their current industry. The objective of these question's are to generate further information based on their current position when compared to the following databases which include questions from the Minnesota Satisfaction Survey (Weiss, Dawis, England and Lofquist, 1967) and the WFC Scale (Thompson, Beauvais & Lyness, 1999). Additional questions were included at the end of the survey with the aim of investigating further suggested issues with female retention

rates based on the literature review discussed in Chapter Two. An example of the questionnaire used can be found Appendix 1.

Closed Questions

Asking closed questions makes it easier to process the results through the selected data analysis system and enables comparability between the respondent's answers to draw conclusions from (Bryman and Bell, 2011). As a result, the majority of the questions to be answered within the questionnaire will be closed with the option of one or two questions to be left open to allow for respondents to elaborate on a point. All closed question were compulsory.

The WFC Scale has over 1,200 citations on Google Scholar, indicating its importance in the field of analysing work-life balance. There are 20 questions within the database, all assessing the participant's views of their current organisation in relation to balancing work and family life. 10 of the sub-questions are reverse scored while the other 10 are scored as normal. The participants are asked to rate their feelings in relation to their current role from a Likert scale of 1 (Strongly Disagree) to 7 (Strongly Agree). Other well known work-life balance surveys were researched such as the Work and Family Conflict Scale (Kelloway, Gottlieb & Barham, 1999), the Oldenburg Burnout Inventory (Demerouti, 1999) and Satisfaction with Work-Family Balance Scale (Valcour, 2007). Ultimately, the researcher found that The WFC Scale was better cited by scholars than the others and also had more relevant questions in line with the research question.

In order to gather information on retention or intent to remain in the industry, the Minnesota Satisfaction Survey was employed. The Minnesota Satisfaction Survey is a well established valid and reliable test which could provide a strong foundation for the measurement of this research (Dalal and Credé, 2013). Measuring JS is a valid method of measuring the employees' intent to remain in the company, therefore the Minnesota Satisfaction Survey will act to measure the intent to remain in the industry (Sinha and Sinha, 2002). Many scholars have linked that this scale developed by Weiss et al. (1967) could be utilised to focus on retention in the Irish IT field (as cited by Dalal and Credé, 2013; Testa, 2001). JS has been noted as a 'key antecedent to voluntarily turnover intentions' (as cited by Lawrence, Celis, Kim, Lipson and Tong, 2014, p.514). This database contains 20 sub-questions, all pertaining to the intended retention of employees based on how satisfied they are in their current company/role. The participants are asked to rate their feelings in relation to their current role from a Likert scale of 1 (Very Dissatisfied) to 5 (Very Satisfied). The aim of these sub-questions is to assess how satisfied the participant is in their current role and how their responses may affect their intended retention.

Open Questions

The researcher has also asked respondents to rate how likely they are to move industries in the future and a qualitative question of if likely, why is that the case. This will allow the researcher better insight into the motivations behind why the participants feel they may move industries in the future. The researcher also asks the respondent to rate whether they feel same-sex role-models exist in their current organisation and adds a qualitative question of do they believe barriers to participation for women exists in their industry. These additional questions were included to better understand the sub-objectives of this research.

Pilot Study

There was a pilot study carried out prior to publishing the questionnaire to Google Forms. The aim of this pilot study was to ensure the instructions were clear, the questions were understandable and that spelling and phraseology was correct. As there is no instructor present during the completion of this questionnaire, due to its online autonomous nature, pilot studies provide an opportunity for any possible misunderstandings to be addressed (Bryman and Bell, 2011). The feedback from the pilot study was returned and corrected prior to the release of the questionnaire.

Sampling and Sampling Procedure

Based on the small scale of this dissertation, the researcher finds the convenience sample to be the most fitting with the objective of this study. Snow balling was employed by contacting an initial small group of participants and requesting they forward the questionnaire to those who would fit the intended target sample, i.e. females working in STEM. Typically snow-ball sampling can mean that it is 'unlikely that the sample will be representative of the population,' the researcher chose this method in order to encourage participants to contact other participants who may have an interest to complete the questionnaire (Bryman and Bell, 2011, p.193), The benefits of these samples are that they are inexpensive, fast and convenient however this may be subject to bias as only a selected sample will be analysed.

In order to achieve the best results from the questionnaire, the sample was targeted at those employed in the IT industry in Ireland or those previously having worked in Ireland. The majority of the sample was aimed at female participants rather than male as the topic is primarily focused on the female retention. A male sample was included to gage their reaction to employment in the IT industry for them compared to the female respondents. Initially, the questionnaire was distributed asking for those

in the STEM industry to take part, hoping once a significant number of female respondents working in IT were complied, those participants working in the Engineering, Mathematics and Science fields could be disregarded. However those employed within the STEM field were included as well as a small sample who were not employed within STEM due to the small sample number gathered.

The questionnaire was emailed to 450 IT students of NCI and emailed to over 100 IT companies currently operating in Ireland. Senior women in IT in Ireland were also contacted directly via email. The questionnaire was also sent to colleagues, family and friends, all of whom were encouraged to forward the questionnaire to anyone once employed within the IT sector in order to yield a higher response rate to the online questionnaire. The questionnaire was kept open for 4 weeks in order to allow as many respondents to complete the questionnaire as possible.

There were 79 respondents to the questionnaire within the 4 weeks it was made available online. Of those 79 respondents, 65 were valid as they have worked/do currently work in Ireland therefore 14 respondents were excluded for the purpose of this research. Out of the STEM industries, IT had a higher response rate than others. There was also a higher rate of female respondents which made up 53.8% of respondents.

Ethical Considerations

The research question was approved by the ethical committee at NCI. All participants were assured of anonymity and confidentiality in the opening page of the questionnaire. This ethical guarantee instructed participants of the protection of their data before participating to ensure they were aware and gave their consent to continue with the questionnaire. Names or companies were not asked specifically for this reason and the information was not required in this research. The researchers email address was also available from the opening page so they could contact the researcher directly with any queries/issues they may have before giving consent.

Data Analysis

In order to evaluate the responses from the quantitative, the data analysis system 'SPSS' (Statistical Package for the Social Science) was applied. SPSS has a primary function to collate data inputted from the completed questionnaires and to generate statistics based on the data (Saunders, Lewis and Thornhill, 2009). SPSS allows the researcher to investigate statistically significant data, internal reliability and validity. As the questionnaire was created via Google Forms, the subsequent results were published into and excel spreadsheet. This excel sheet was then coded into numerical variables

to replace their literal form. The data was coded to allow for the conversion into an SPSS spreadsheet. The Minnesota Satisfaction scale had 10 items reverse scored out of the 20 items in total. These items were reversed using SPSS prior to reliability testing. Chapter 5 will provide the details for the output discovered when comparing dependent and independent variables through SPSS. Based on these findings, the results will be detailed in Chapter 6 and discussed in reference to the research question.

Limitations

The researcher aimed to compile as many responses as possible from the sample however non-response was found to be an issue. Out of the over 550 people emailed, most to a direct email account rather than a generic company email, only 79 completed the survey. This was unexpected although the researcher understood this risk before beginning research on this topic.

CHAPTER FIVE

FINDINGS AND ANALYSIS

1. Presentation of Findings

As mentioned within the Chapter Four, the questionnaire was compiled of demographic, JS, WFC and other probing questions relating to possible impacts on female retention (See Appendix 1). There are 59 questions in total including scales.

2. General Statistics

The demographic questions are acting as the independent variables throughout this analysis. 12 questions within the questionnaire relate to the demographic of the respondent in relation to their personal and professional life. The following are an example of the 12 questions to provide further information about the participants of this study.

Figure 1.1 depicts a bar chart representing the percentage gender breakdown of the 65 valid respondents as answered in Question 1. The percentage is displayed on the Y-Axis. **Figure 1.2** represents the frequency of which gender occurs along the Y-axis. The gender is displayed along the X-axis on both **Figure 1.1** and **Figure 1.2**. As evident from both bar charts and visible from **Table 1.1**, **53.8%** respondents were female and **46.2%** were male.

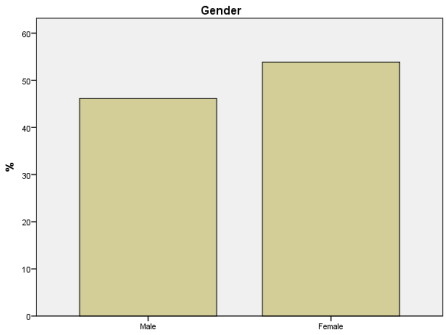

Figure 1.1

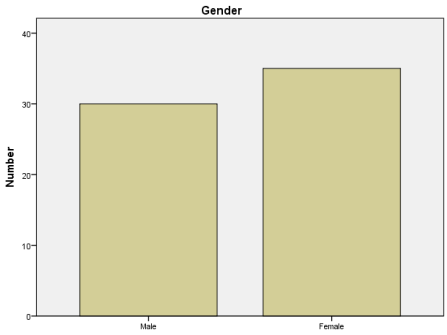

Figure 1.2

What is your gender?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	30	46.2	46.2	46.2
	Female	35	53.8	53.8	100.0
	Total	65	100.0	100.0	

Table 1.1: Gender Frequency Distribution and Percentage Frequency Distribution

Figure 2.1 displays the percentage of respondents aged between 18-25, 26-35, 36-45, 46-55 and 56-65 years old respectively. **Figure 2.2** displays the number of respondents within those age brackets. The age is displayed along the X-axis with the percentage (**Figure 2.1**) and frequency (**Figure 2.2**) displayed on the Y-axis. **38.5%** was the highest age grouping of respondents who were aged between 26-35 years old as evident through both **Figure 2.1** and **Figure 2.2**.

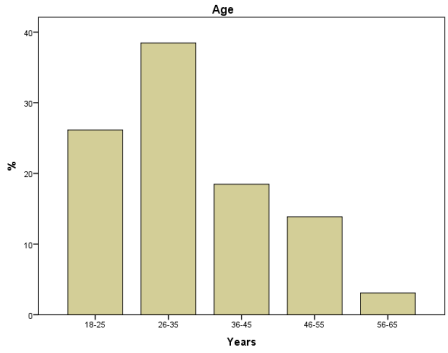

Figure 2.1

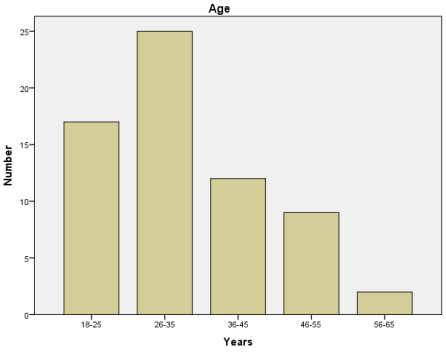

Figure 2.2

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-25	17	26.2	26.2	26.2
	26-35	25	38.5	38.5	64.6
	36-45	12	18.5	18.5	83.1
	46-55	9	13.8	13.8	96.9
	56-65	2	3.1	3.1	100.0
	Total	65	100.0	100.0	

Table 1.2: Age Frequency Distribution and Percentage Frequency Distribution

Figure 3.1 illustrates a bar chart detailing the percentage describing which industry the respondents are currently employed within. The industry is displayed along the X-axis with the percentage (**Figure 3.1**) and frequency (**Figure 3.2**) displayed on the Y-axis. **Table 1.3** displays the details of the frequency distribution of which industry they are employed within. For example, IT was the industry which almost three quarters of respondents were employed with **72.3%**.

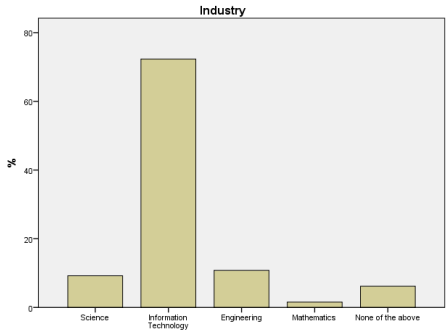

Figure 3.1

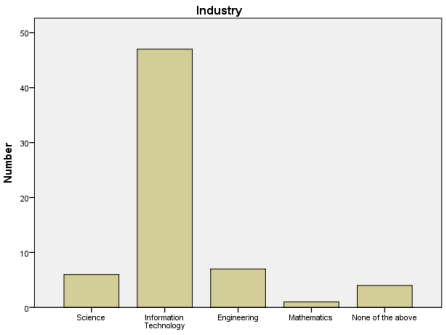

Figure 3.2

Industry

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Science	6	9.2	9.2	9.2
	IT	47	72.3	72.3	81.5
	Engineering	7	10.8	10.8	92.3
	Mathematics	1	1.5	1.5	93.8
	None of the above	4	6.2	6.2	100.0
	Total	65	100.0	100.0	

Table 1.3: Industry Frequency Distribution and Percentage Frequency Distribution

As illustrated within the below bar charts, **Figure 4.1** displays the percentage of respondents categorised into their level of managerial level and **Figure 4.2** displays the number of respondents at each management level. The managerial level is displayed along the X-axis with the percentage (**Figure 4.1**) and frequency (**Figure 4.2**) displayed on the Y-axis. **Table 1.4** describes the frequency distribution of the respondents. For example, there are an equal number of those in the middle level and senior level with **27.7%** of respondents in each level.

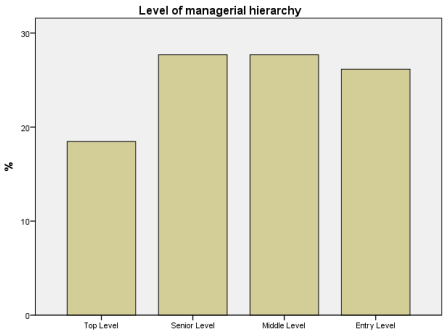

Figure 4.1

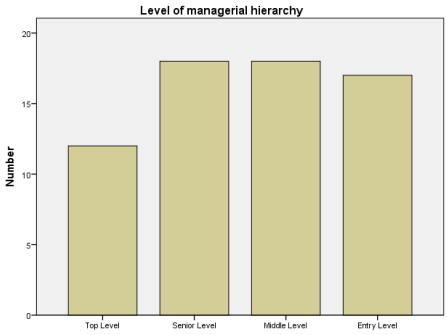

Figure 4.2

Level of managerial hierarchy

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Top Level	12	18.5	18.5	18.5
	Senior Level	18	27.7	27.7	46.2
	Middle Level	18	27.7	27.7	73.8
	Entry Level	17	26.2	26.2	100.0
	Total	65	100.0	100.0	

Table 1.4: Managerial Hierarchy Frequency Distribution and Percentage Frequency Distribution

Figure 5.1 and **Figure 5.2** show the number of dependent children per respondent by percentage and number respectively. The number of dependent children is displayed along the X-axis with the percentage (**Figure 5.1**) and frequency (**Figure 5.2**) displayed on the Y-axis. **Table 1.5** shows that **70.8%** of respondents have no children. This percentage of respondents with no children equals **46** respondents.

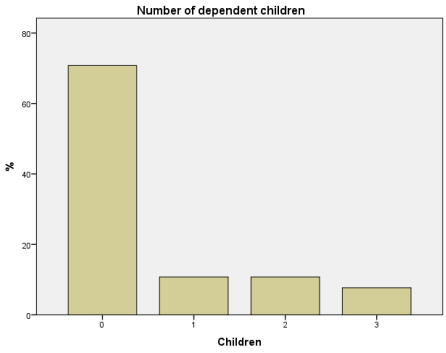

Figure 5.1

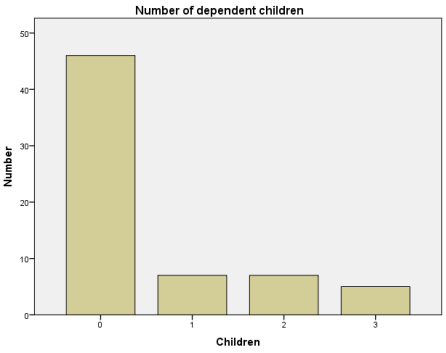

Figure 5.2

No. of dependent children

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	46	70.8	70.8	70.8
	1	7	10.8	10.8	81.5
	2	7	10.8	10.8	92.3
	3	5	7.7	7.7	100.0
	Total	65	100.0	100.0	

Table 1.5: Dependent Children Frequency Distribution and Percentage Frequency Distribution

Barriers to Participation for Women

The participants were asked an open question asking to discuss whether they perceived any barriers to participation for women within their industry. These answers were coded according to identified themes, as per qualitative data analysis methods. **Figure 6.1** illustrates the percentage of respondents on the Y-axis with the barrier groupings on the X-axis. For example, respondents who acknowledged no barriers to participation for women is the highest percentage with **44.6% (Table 1.6)**. Although the themes female underrepresentation and family responsibilities are also perceived as barriers to participation for women, if these values were included within the yes value they would be less than the no values (**21** respondents in comparison **29** respondents respectively).

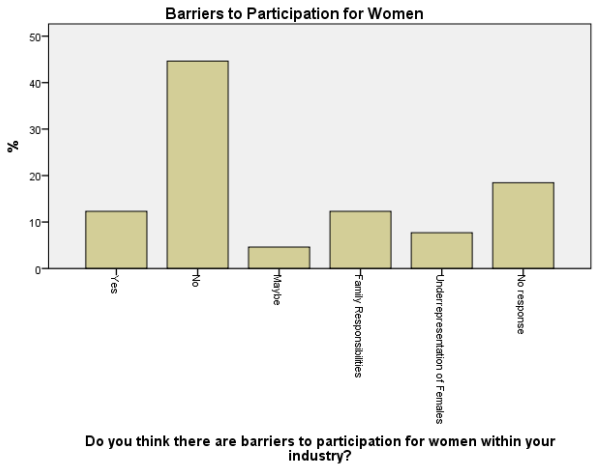

Figure 6.1

Barriers to Participation for Women

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	8	12.3	12.3	12.3
	No	29	44.6	44.6	56.9
	Maybe	3	4.6	4.6	61.5
	Family Responsibilities	8	12.3	12.3	73.8
	Underrepresentation of Females	5	7.7	7.7	81.5
	No response	12	18.5	18.5	100.0
	Total	65	100.0	100.0	

Table 1.6: Frequency Distribution and the Percentage Frequency Distribution for Barriers to Participation for Women

Figure 7.1 illustrates the relationship between the gender and age compared to JS for employees employed in the IT sector. For the purpose of this table those not employed within IT have been excluded from the sample. The mean of the JS is displayed along the Y-axis with the two age groupings (grouped for the purposes of this graph) appearing on the x-axis. Gender is represented by two columns. For example, it is visually evident that females under 35 have a higher JS compared to females over 35 years of age.

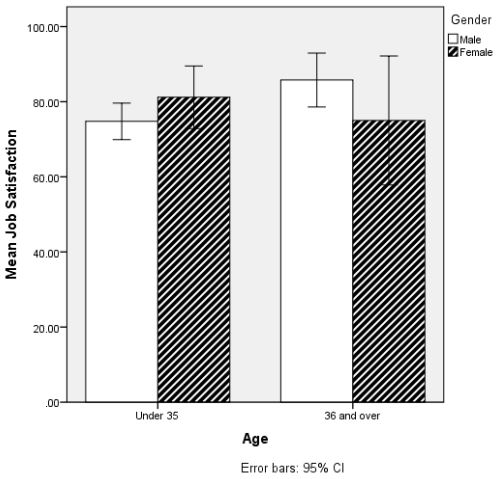

Figure 7.1

3. Reliability Measures

The research is dependent on minimising and removing errors within the findings. In order to ensure the questions asked within the scale reflect a reliable outcome, Cronbach's Alpha reliability test is a common indicator of internal consistency. The Cronbach's coefficient ranges from 0 to 1 Alpha and must be greater than 0.7 in order to be deemed reliable (Pallant, 2013). A figure above 0.7 is acceptable as a good measure of internal reliability however 0.8 is understood as a better score of reliability.

Cronbach's Alpha was carried out on the results from the Minnesota Satisfaction scale. **Table 1.8** depicts the Cronbach's Alpha result of **0.943** of the 20 items tested. This indicates strong internal reliability.

Cronbach's Alpha was carried out on the results from the WFC scale. **Table 1.9** depicts the Cronbach's Alpha result of **0.866** of the 20 items tested. This indicates strong internal reliability.

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.943	.944	20

Table 1.7: JS Reliability Test Table

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.866	.873	20

1.8: Work-Family Reliability Test

Items from **Table 1.7** and **Table 1.8** were created to a composite scale score to allow for an overall JS or WFC score to be tested in the following data analysis tests.

4. Tests of Difference

In order to analyse the relationship between two or more variables, test of difference must be generated in order to assess whether they are statistically significant. Normality tests were completed first in order to assess which test of difference was to be carried out on the variables in question. Following on from the results of the normality test, parametric or non-parametric techniques will be applied to both independent and dependent variables to understand whether a correlation exists. Gender was the only variable tested to use a Mann-Whitney U Test. A Kruskal-Wallis test was employed to analyse the remaining dependent variables which were three or more independent groups (Foster, 2001).

4.1 Normality Tests in relation to Gender

A normality test was first completed to analyse whether there is a statistically significant difference between the dependent variable and independent variable, gender. This is carried out in order to best determine which difference test would yield the most accurate results. If the variables are discovered to be normal then an Independent Sample T-test is carried out. Alternatively if the variables are found to be deviating from normality then a Mann-Whiney U Test is carried out. All variables in **Table 1.9** display the result of the normality test in relation to gender. All the variables in the Shapiro-Wilk section in **Table 1.9** deviate from a normal distribution of $p < 0.05$. For example, JS of females generated a test statistic of **0.921**, **35** degrees of freedom and **0.015** significance (**Shapiro-Wilk = 0.921, df = 35, p = 0.015**). Although the male grouping within the JS variable indicated a normal distribution, a Mann-Whitney U test must be generated.

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Gender	Statistic	df	Sig.	Statistic	df	Sig.
JobSat	Male	.127	30	.200*	.955	30	.229
	Female	.097	35	.200*	.921	35	.015
WFC	Male	.123	30	.200*	.923	30	.032
	Female	.106	35	.200*	.971	35	.464
SSRM	Male	.230	30	.000	.834	30	.000
	Female	.170	35	.012	.844	35	.000
BPW	Male	.394	30	.000	.708	30	.000
	Female	.242	35	.000	.891	35	.002
ELMI	Male	.204	30	.003	.866	30	.001
	Female	.182	35	.005	.887	35	.002

Table 1.9: Tests of Normality in relation to Gender

4.1.1. JS

Table 1.9 shows that the normality test deviates from a normal distribution of p<0.05. The male variable indicates a normal distribution (**p= 0.229**) as the significance in the Shaprio-Wilks test is above 0.05, however the female distribution (**p=0.015**) indicated an abnormal distribution. **Figure 8.1** is a histogram displaying the abnormal distribution between JS and gender. **Figure 8.2** and **Figure 8.3** display the distribution by female and male responses respectively. The gender is displayed along the X-axis with the frequency displayed on the Y-axis in **Figure 8.1, Figure 8.2** and **Figure 8.3**. This leads the researcher to conduct a non-parametric statistical test to appropriately test the relationship between the JS and gender.

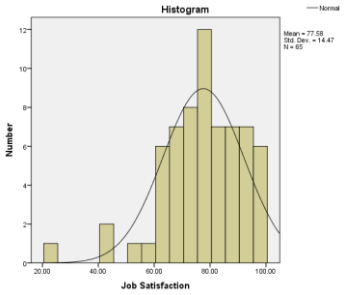

Figure 8.1

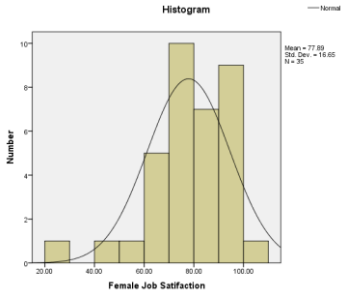

Figure 8.2

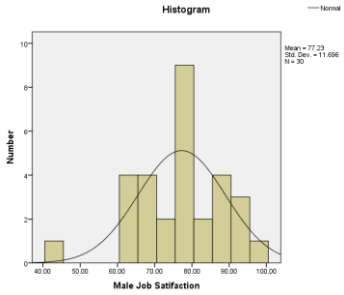

Figure 8.3

Ranks

	Gender	N	Mean Rank	Sum of Ranks
JS	Male	30	31.62	948.50
	Female	35	34.19	1196.50
	Total	65		

Table 1.10: JS Ranks

Test Statistics[a]

	JS
Mann-Whitney U	483.500
Wilcoxon W	948.500
Z	-.546
Asymp. Sig. (2-tailed)	.585

Table 2.10: Mann-Whitney U Test

Table 1.10 depicts the typical output from a Mann-Whitney U Test in relation to JS and gender. The results from **Table 1.10** show the mean ranks and sum of ranks for each of the variables and separated into gender.

A Mann-Whitney U Test was generated in order to understand the correlation between JS and gender variables. **Table 2.10** illustrates the findings from the Mann-Whitney U Test. The significance level is greater than 0.05 therefore the result is not significant between JS and gender (**p=0.585).**

4.1.2. WFC

Table 1.9 shows that the normality test deviates from a normal distribution of p<0.05. The female variable indicates a normal distribution (**p= 0.464**) as the significance in the Shaprio-Wilks test is above 0.05, however the male distribution (**p=0.032**) indicated an abnormal distribution. **Figure 9.1** is a histogram displaying the abnormal distribution. **Figure 9.2** and **Figure 9.3** displays the female and male results respectively. The gender is displayed along the X-axis with the frequency displayed on the Y-axis in **Figure 9.1**, **Figure 9.2** and **Figure 9.3**.This leads the researcher to conduct a non-parametric statistical test to appropriately test the relationship between the WFC and gender.

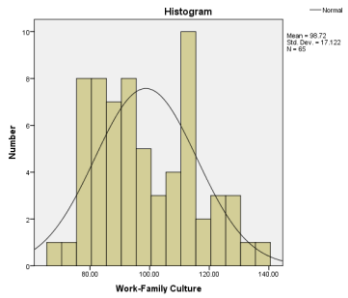

Figure 9.1

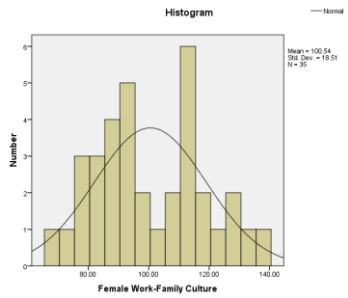

Figure 9.2

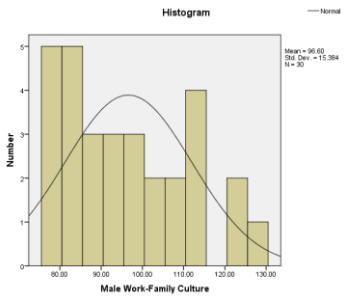

Figure 9.3

Ranks

	Gender	N	Mean Rank	Sum of Ranks
WFC	Male	30	30.93	928.00
	Female	35	34.77	1217.00
	Total	65		

Table 1.11: WFC Ranks

Test Statistics[a]

	WFC
Mann-Whitney U	463.000
Wilcoxon W	928.000
Z	-.816
Asymp. Sig. (2-tailed)	.414

Table 2.11: Mann-Whitney U Test

Table 1.11 depicts the typical output from a Mann-Whitney U Test in relation to WFC and gender. The results from **Table 1.11** show the mean ranks and sum of ranks for each of the variables and separated into gender.

A Mann-Whitney U Test was generated in order to understand the correlation between WFC and gender variables. **Table 2.11** illustrates the findings from the Mann-Whitney U Test. The significance level is greater than 0.05 therefore the result is not significant between WFC and gender **(p=0.414).**

4.1.3. Same Sex Role-Models

Table 1.9 shows that the normality test deviates from a normal distribution of p<0.05 for example, p(sig) equals **0.000** within the Shapiro-Wilk test for both male and female distributions. **Figure 10.1**

is a histogram displaying the abnormal distribution. **Figure 10.2** and **Figure 10.3** display the female and male results respectively. The gender is displayed along the X-axis with the frequency displayed on the Y-axis in **Figure 10.1**, **Figure 10.2** and **Figure 10.3**.This leads the researcher to conduct a non-parametric statistical test to appropriately test the relationship between the same sex role-models and gender.

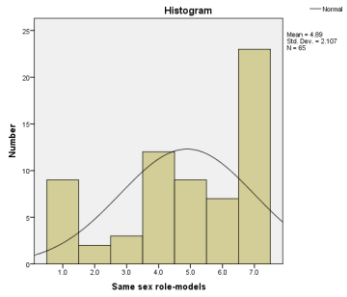

Figure 10.1

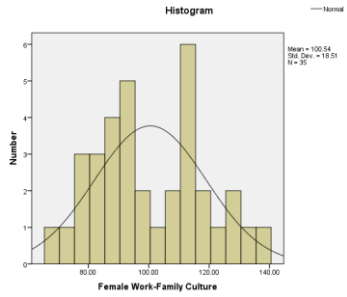

Figure 10.2

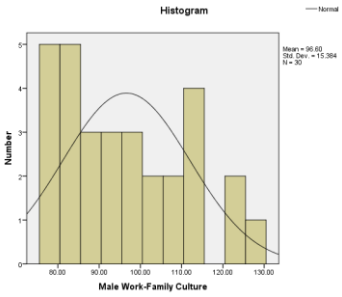

Figure 10.3

Ranks

	Gender	N	Mean Rank	Sum of Ranks
SSRM	Male	30	35.87	1076.00
	Female	35	30.54	1069.00
	Total	65		

Table 1.12: Ranks Same Sex Role-Models

Test Statistics[a]

	SSRM
Mann-Whitney U	439.000
Wilcoxon W	1069.000
Z	-1.165
Asymp. Sig. (2-tailed)	.244

Table 2.12: Mann-Whitney U Test

Table 1.12 depicts the typical output from a Mann-Whitney U Test in relation to same sex-role models and gender. The results from **Table 1.12** show the mean ranks and sum of ranks for each of the variables and separated into gender.

A Mann-Whitney U Test was generated in order to understand the correlation between same sex role-models and gender variables. **Table 2.12** illustrates the findings from the Mann-Whitney U Test. The significance level is greater than 0.05 therefore the null hypothesis is accepted (**p=0.244).**

4.1.4. Barriers to Participation for Women

Table 1.9 shows that the normality test deviates from a normal distribution of p<0.05 for example, p(sig) equals **0.000** and **0.002** within the Shapiro-Wilk test for both male and female distributions respectively. **Figure 11.1** is a histogram displaying the abnormal distribution. **Figure 11.2** and **Figure 11.3** display the female and male results respectively. The gender is displayed along the X-axis with the frequency displayed on the Y-axis in **Figure 11.1**, **Figure 11.2** and **Figure 11.3**.This

leads the researcher to conduct a non-parametric statistical test to appropriately test the relationship between the barriers to participation for women and gender.

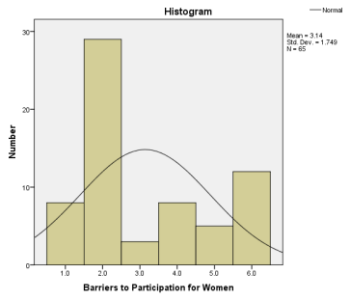

Figure 11.1

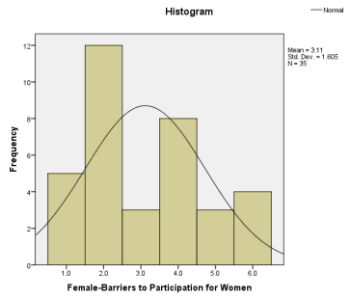

Figure 11.2

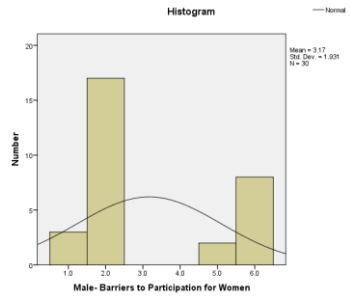

Figure 11.3

Ranks

	Gender	N	Mean Rank	Sum of Ranks
BPW	Male	30	32.75	982.50
	Female	35	33.21	1162.50
	Total	65		

Table 1.13: Barriers to participation for women Ranks

Test Statistics[a]

	BPW
Mann-Whitney U	517.500
Wilcoxon W	982.500
Z	-.104
Asymp. Sig. (2-tailed)	.917

Table 2.13: Mann-Whitney U Test

Table 1.13 depicts the typical output from a Mann-Whitney U Test in relation to barriers to participation for women and gender. The results from **Table 1.13** show the mean ranks and sum of ranks for each of the variables and separated into gender.

A Mann-Whitney U Test was generated in order to understand the correlation between barriers to participation for women and gender variables. **Table 2.13** illustrates the findings from the Mann-Whitney U Test. The significance level is greater than 0.05 therefore the null hypothesis is accepted **(p=0.917).**

4.1.5. Employees who are likely to move industries in the future

Table 1.9 shows that the normality test deviates from a normal distribution of $p<0.05$ for example, p(sig) equals **0.001** and **0.002** within the Shapiro-Wilk test for both male and female distributions respectively. **Figure 12.1** is a histogram displaying the abnormal distribution. **Figure 12.2** and **Figure 12.3** display the female and male results respectively. The gender is displayed along the X-axis with the frequency displayed on the Y-axis in **Figure 12.1**, **Figure 12.2** and **Figure 12.3**.This

leads the researcher to conduct a non-parametric statistical test to appropriately test the relationship between the employees who are likely to move industries in the future and gender.

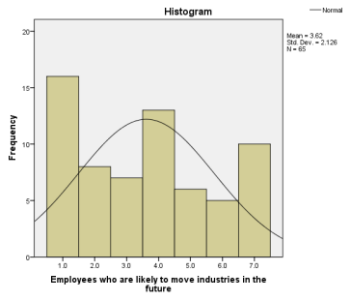

Figure 12.1

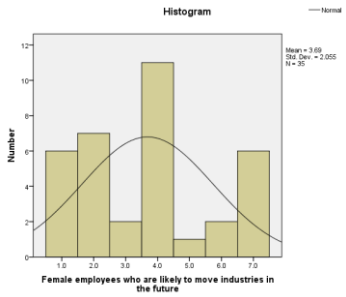

Figure 12.2

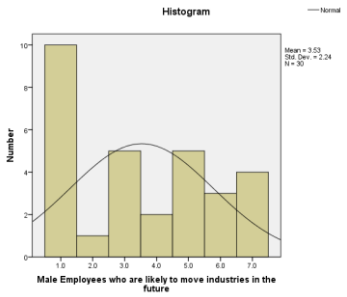

Figure 12.3

Ranks

	Gender	N	Mean Rank	Sum of Ranks
ELTMI	Male	30	32.00	960.00
	Female	35	33.86	1185.00
	Total	65		

Table 1.14: Employees who are likely to Move Industries in the Future Ranks

Test Statistics[a]

	ELTMI
Mann-Whitney U	495.000
Wilcoxon W	960.000
Z	-.401
Asymp. Sig. (2-tailed)	.688

Table 2.14: Mann-Whitney U Test

Table 1.14 depicts the typical output from a Mann-Whitney U Test in relation to employees who are likely to move industries in the future and gender. The results from **Table 1.14** show the mean ranks and sum of ranks for each of the variables and separated into gender.

A Mann-Whitney U Test was generated in order to understand the correlation between employees who are likely to move industries in the future and gender variables. **Table 2.14** illustrates the findings from the Mann-Whitney U Test. The significance level is greater than 0.05 therefore the null hypothesis is accepted (**p=0.688).**

4.2. Tests of Difference in relation to Age

All variables in **Table 1.15** display the result of the normality test in relation to age. All the variables in the Shapiro-Wilk section in **Table 1.15** deviate from a normal distribution of $p < 0.05$. For example, in JS generated a test statistic of **0.938**, **65** degrees of freedom and **0.003** significance (**Shapiro-Wilk = 0.938, df = 65, p = 0.003**). The results indicate a Kruskal-Wallis test must be generated.

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
JS	.069	65	.200*	.938	65	.003
WFC	.105	65	.073	.960	65	.034
BPW	.312	65	.000	.819	65	.000
ELTMI	.146	65	.002	.891	65	.000

Table 1.15: Tests of Normality in relation to Age

4.2.1 JS

A normality test was first completed to analyse whether there is a statistically significant difference between JS and age. **Table 1.15** shows that the normality test deviates from a normal distribution of $p<0.05$ for example, p(sig) equals **0.003** within the Shapiro-Wilk test. This leads the researcher to conduct a non-parametric statistical test to appropriately test the relationship between the JS and age.

Ranks

	Age	N	Mean Rank
JS	18-25	17	28.09
	26-35	25	31.80
	36-45	12	44.33
	46-55	9	30.06
	56-65	2	35.00
	Total	65	

Table 1.16: JS Ranks

Test Statistics[a,b]

	JS
Chi-Square	5.806
df	4
Asymp. Sig.	.214

Table 2.16: Kruskal-Wallis Test

Table 1.16 depicts the typical output from a Kruskal-Wallis Test in relation to JS and age. The results from **Table 1.16** show the mean ranks and sum of ranks for each of the variables and separated into age groupings. It is evident that those aged over 36 years old have a higher mean (**36-45 44.33 mean, 46-55 30.06 mean, 56-65 35 mean**) than those aged under 35 (**18-25 28.09 mean, 26-35 31.80 mean**).

A Kruskal-Wallis Test was generated in order to understand the correlation between JS and age variables. **Table 2.16** illustrates the findings from the Kruskal-Wallis Test. The significance level is greater than 0.05 therefore the result is not significant between JS and age (**p=0.214).**

4.2.2. WFC

Table 1.15 shows that the normality test deviates from a normal distribution of p<0.05 for example, p(sig) equals **0.034** within the Shapiro-Wilk test. This leads the researcher to conduct a non-parametric statistical test to appropriately test the relationship between WFC and age.

Ranks

	Age	N	Mean Rank
WFC	18-25	17	29.38
	26-35	25	34.96
	36-45	12	35.50
	46-55	9	32.28
	56-65	2	27.50
	Total	65	

Table 1.17: WFC Ranks

Test Statistics[a,b]

	WFC
Chi-Square	1.284
df	4
Asymp. Sig.	.864

Table 2.17: Kruskal-Wallis Test

Table 1.17 depicts the typical output from a Kruskal-Wallis Test in relation to WFC and age. The results from **Table 1.17** show the mean ranks and sum of ranks for each of the variables and separated into age groupings.

A Kruskal-Wallis Test was generated in order to understand the correlation between WFC and age variables. **Table 2.17** illustrates the findings from the Kruskal-Wallis Test. The significance level is greater than 0.05 therefore the null hypothesis is accepted (**p=0.864**).

4.2.3. Barriers to Participation for Women

Table 1.15 shows that the normality test deviates from a normal distribution of p<0.05 for example, p(sig) equals **0.000** within the Shapiro-Wilk test. This leads the researcher to conduct a non-parametric statistical test to appropriately test the relationship between the barriers to participation for women and age.

Ranks

	Age	N	Mean Rank
BPW	18-25	17	35.79
	26-35	25	35.64
	36-45	12	30.96
	46-55	9	21.28
	56-65	2	41.25
	Total	65	

Table 1.18: Barriers to Participation for Women Ranks

Test Statistics[a,b]

	BPW
Chi-Square	5.371
df	4
Asymp. Sig.	.251

b. Grouping Variable: Age

Table 2.18: Kruskal-Wallis Test

Table 1.18 depicts the typical output from a Kruskal-Wallis Test in relation to barriers to participation for women and age. The results from **Table 1.18** show the mean ranks and sum of ranks for each of the variables and separated into age groupings.

A Kruskal-Wallis Test was generated in order to understand the correlation between barriers to participation for women and age variables. **Table 2.18** illustrates the findings from the Kruskal-Wallis Test. The null hypothesis is accepted therefore the result is not significant between barriers to participation for women and age (**p=0.251).**

4.2.4. Employees who are likely to Move Industries in the Future

Table 1.15 shows that the normality test deviates from a normal distribution of $p<0.05$ for example, p(sig) equals **0.000** within the Shapiro-Wilk test. This leads the researcher to conduct a non-parametric statistical test to appropriately test the relationship between the Employees who are likely to move industries in the future and gender.

Ranks

	Age	N	Mean Rank
ELTMI	18-25	17	32.76
	26-35	25	36.16
	36-45	12	36.63
	46-55	9	23.11
	56-65	2	18.25
	Total	65	

Table 1.19: Employees who are likely to Move Industries Ranks

Test Statistics[a,b]

	ELTMI
Chi-Square	4.974
df	4
Asymp. Sig.	.290

Table 2.19: Kruskal-Wallis Test

Table 1.19 depicts the typical output from a Kruskal-Wallis Test in relation to employees who are likely to move industries and age. The results from **Table 1.19** show the mean ranks and sum of ranks for each of the variables and separated into age groupings.

A Kruskal-Wallis Test was generated in order to understand the correlation between employees who are likely to move industries and age variables. **Table 2.19** illustrates the findings from the Kruskal-Wallis Test. The null hypothesis is accepted therefore the result is not significant between employees who are likely to move industries in the future and age (**p=0.290).**

4.3. Tests of Difference in relation to Industry

All variables in **Table 1.20** display the result of the normality test in relation to age. All the variables in the Shapiro-Wilk section in **Table 1.20** deviate from a normal distribution of p< 0.05. For example, JS generated a test statistic of **0.938**, **65** degrees of freedom and **0.003** significance **(Shapiro-Wilk = 0.938, df = 65, p = 0.003)**. The results indicate a Kruskal-Wallis test must be generated.

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
JS	.069	65	.200*	.938	65	.003
BPW	.312	65	.000	.819	65	.000

Table 1.20: Tests of Normality for JS and Industry

4.3.1. JS

A normality test was first completed to analyse whether there is a statistically significant difference between the dependent variable, JS, and independent variable, industry. **Table 1.20** shows that the normality test deviates from a normal distribution of p<0.05 for example, p(sig) equals **0.03** within the Shapiro-Wilk test. This leads the researcher to conduct a non-parametric statistical test to appropriately test the relationship between JS and industry.

Ranks

	Industry	N	Mean Rank
JS	Science	6	18.83
	IT	47	35.48
	Engineering	7	29.93
	Mathematics	1	63.50
	None of the above	4	22.88
	Total	65	

Table 1.21: JS Ranks

Test Statistics[a,b]

	JS
Chi-Square	8.119
df	4
Asymp. Sig.	.087

Table 2.21: Kruskal-Wallis Test

Table 1.21 depicts the typical output from a Kruskal-Wallis Test in relation to JS and industry. The results from **Table 1.21** show the mean ranks and sum of ranks for each of the variables and separated into industry groupings.

A Kruskal-Wallis Test was generated in order to understand the correlation between JS and industry variables. **Table 2.21** illustrates the findings from the Kruskal-Wallis Test. The significance level is greater than 0.05 therefore the null hypothesis is accepted **(p=0.087).**

4.3.2. Barriers to Participation for Women

Table 1.19 shows that the normality test deviates from a normal distribution of p<0.05 for example, p(sig) equals **0.000** within the Shapiro-Wilk test. This leads the researcher to conduct a non-parametric statistical test to appropriately test the relationship between the barriers to participation for women and industry.

Ranks

	Industry	N	Mean Rank
BPW	Science	6	35.50
	IT	47	32.85
	Engineering	7	26.00
	Mathematics	1	59.50
	None of the above	4	36.63
	Total	65	

Table 1.22: Barriers to Participation for Women Ranks

Test Statistics[a,b]

	BPW
Chi-Square	3.529
df	4
Asymp. Sig.	.474

Table 2.22: Kruskal-Wallis Test

Table 1.22 depicts the typical output from a Kruskal-Wallis Test in relation to barriers to participation for women and industry. The results from **Table 1.22** show the mean ranks and sum of ranks for each of the variables and separated into industry groupings.

A Kruskal-Wallis Test was generated in order to understand the correlation between barriers to participation for women and industry variables. **Table 2.22** illustrates the findings from the Kruskal-Wallis Test. The significance level is greater than 0.05 therefore the result is not significant between barriers to participation for women and industry **(p=0.474).**

4.4. Tests of Difference in relation to Hours Worked per week

All variables in **Table 1.23** display the result of the normality test in relation to age. All the variables in the Shapiro-Wilk section in **Table 1.23** deviate from a normal distribution of p< 0.05. For example, in JS generated a test statistic of **0.938**, **65** degrees of freedom and **0.003** significance (**Shapiro-Wilk = 0.938, df = 65, p = 0.003**). The results indicate a Kruskal-Wallis test must be generated.

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
JS	.069	65	.200*	.938	65	.003

Table 1.23: Tests of Normality for JS and Hours worked per week

4.4.1. JS

Table 1.23 shows that the normality test deviates from a normal distribution of p<0.05 for example, p(sig) equals **0.000** within the Shapiro-Wilk test. This leads the researcher to conduct a non-parametric statistical test to appropriately test the relationship between JS and hours worked per week.

Ranks

	Hours worked per week	N	Mean Rank
JS	Below 19 hours p.w.	2	19.00
	20-29 hours p.w.	4	28.63
	30-39 hours p.w.	22	35.27
	40-49 hours p.w.	31	28.50
	Over 50 hours p.w.	6	55.50
	Total	65	

Table 1.24: JS Ranks

Test Statistics[a,b]

	JS
Chi-Square	11.894
df	4
Asymp. Sig.	.018

Table 2.24: Kruskal-Wallis Test

Table 1.24 depicts the typical output from a Kruskal-Wallis Test in relation to JS and hours worked per week. The results from **Table 1.24** show the mean ranks and sum of ranks for each of the variables and separated into hours worked per week groupings.

A Kruskal-Wallis Test was generated in order to understand the correlation between JS and hours worked per week variables. **Table 2.24** illustrates the findings from the Kruskal-Wallis Test. The significance level is less than 0.05 therefore the null hypothesis is rejected (**p=0.018).**

5. Correlation

Correlation analysis is designed to 'describe the strength and direction of the linear relationship between two variables' (Pallant, 2013, p.133). According to Pallant (2013) the direction of the relationship will be determined by a positive or negative value of the correlation coefficient, with a positive result indicating as one variable increases, so does the other and negative result indicating as one variable increases, the other decreases. The strength is determined by the value of the correlation coefficient; +1 indicates a positive correlation, 0 indicates no relationship and -1 indicates a negative correlation (Pallant, 2013). For the purposes of the following correlation tests, the researcher has employed the Spearman rho correlation test due to the non-parametric nature of the variables. The researcher has also excluded all non-IT employees from the sample size, resulting in **47** valid participants.

Correlations

			JS	Gender	Age	Managerial Level
Spearman's rho	JS	Correlation Coefficient	1.000	.087	.119	-.213
		Sig. (2-tailed)	.	.563	.424	.151
		N	47	47	47	47
	Gender	Correlation Coefficient	.087	1.000	-.050	-.031
		Sig. (2-tailed)	.563	.	.737	.836
		N	47	47	47	47
	Age	Correlation Coefficient	.119	-.050	1.000	-.375**
		Sig. (2-tailed)	.424	.737	.	.009
		N	47	47	47	47
	Managerial Level	Correlation Coefficient	-.213	-.031	-.375**	1.000
		Sig. (2-tailed)	.151	.836	.009	.
		N	47	47	47	47

Table 1.25: Spearman rho Correlation Test

An examination of the correlation between JS, gender, age and managerial level is presented in **Table 1.25**. This table displays the correlation coefficient (r), significance (p value) and the number of the corresponding variables. For example, when describing the relationship between JS and age r is found to be **0.119** with a significance value of **0.424** out of the **47** participants. The significance value is greater than 0.05, therefore the relationship is not statistically significant. Age and gender cannot be examined together through the Spearman rho correlation test as neither variable is ordinal, a compulsory qualification for the test to be valid (Pallant, 2013).

CHAPTER SIX

DISCUSSION OF FINDINGS

The objective of this research was to understand the factors impacting retention rates of employees in the IT Sector in Ireland. This chapter will discuss the findings from Chapter Five in relation to the objectives. Chapter Two detailed the previous literature relating to such influences on STEM retention rates of females in particular. The literature will be referred to when discussing the findings of this research. The limitations will also be acknowledged in order to identify the significance of the findings.

The purpose of this research was to investigate the gap in current literature and attempt to understand whether female employees exiting the IT field with no intention to return exists in Ireland. The researcher has analysed the findings from the completed questionnaire using tests of difference, Mann-Whitney U-tests and Kruskal-Wallis Tests and Spearman rho correlation tests as detailed in Chapter Five. Out of the 79 respondents, 65 were deemed by the researcher to be valid for the purposes of this research. The researcher acknowledged this is a smaller sample than expected and of those 65 respondents 72.3% were employed within the IT sector in Ireland. Upon reflection, the researcher decided to include all 65 respondents to compare the results from each sector to determine if any correlation exists as the majority of literature in based on STEM results. However for the purposes of the Spearman correlation test the researcher excluded those not employed within IT. This was to focus primarily on the evidence gathered regarding the IT industry specifically in line with the primary focus of this research.

Due to all the tested variables deviating from a normal distribution, the researcher had hoped to compare the hypothesis based on three variables simultaneously. This prevented further investigation into the difference between three or more variables as non-parametric tests, both Mann-Whitney U Test and Kruskal-Wallis Test, were employed throughout. This resulted in fewer generated comparisons than expected.

Adopting a quantitative deductive method, the researcher had certain hypothesis regarding this study. Gender was deduced to play a significant role in retention rates as discovered within the aforementioned literature. Glass et al. (2013) explored gender differences within the U.S.A. STEM field which discovered women exited early in their careers and did not return to the STEM field upon return to the workforce. The research hypothesis assumed a difference between retention rates and gender (H1) based on previous literature on this topic (Trauth et al., 2008; Black et al., 2005), however this was not translated to this research. This study has displayed no evidence to suggest this

may be the case in Ireland. The findings from this study in relation to gender indicated there was no statistically significant distinction between male and female JS and therefore their intent to exit/stay in their respective field. Table 1.14 depicts that females are more likely to leave their industries in the future (Mean=33.86) compared to male employees (Mean=32) however the Mann Whitney U test confirms this is not statistically significant. For the purpose of this research the JS variable is another indicator for intent to exit the industry. It is evident that female employees have a higher JS than males according to their mean values in Table 1.9. Table 1.10 details the tests of no significance and this is further supported by the correlation output in Table 1.24 which displays a non-significant result, thus proving the null hypothesis that there is no difference between gender and retention rates and disproving H1.

Employees aged over 36 years of age appear to have a higher level of JS than those below 35 years of age as evident in Table 1.15. Those within the 36-45 age grouping showed the highest level of JS unlike findings discovered by Glass et al. (2013). Glass et al. (2013) found that women who were aged over 35 years of age were more likely to exit the STEM industry. Although it was not possible to directly test this in conjunction with gender due to the non-parametric nature of the variable distributions, the gender test of difference against JS showed that women were slightly more satisfied than males. It is to be noted that both these slight differences were not statistically significant and therefore the hypothesis that women in Ireland aged over-35 will have a lower intended retention rate in IT compared to women under-35 (H2) is untrue. Table 1.24 depicts the correlation between age and JS as well as gender and JS within the IT respondents. These findings indicates no significance in either respect and therefore the research H2 finds that both male and female IT employees over-35 and under-35 have similar JS levels and therefore a similar intention to exit/stay in the industry.

The respondents were asked to elaborate on whether they perceived a barrier to female participation to exist. 44.6% of these respondents did not view a barrier to participation within the IT field and many elaborated to indicate that it is the barriers women enforce on themselves that may hinder progression. These answers were coded for the purposes of statistical tests however the following are extracts of answers received:

'As with any gender, if women are available for work, are strong team players, contribute well and add value in their roles, have the knowledge and expertise in their skill set, a desire for success, there are no barriers.'(Female IT employee)

'Many males in positions of authority and leadership display an innate bias against their females colleagues particularly when in male only setting leading me to surmise that they will be bias against females during selection processes and in selecting staff for advantageous projects' (Male IT employee)

'The barriers we have are in our own heads. As women we need to be more confident in our abilities in what essentially is still a man's world. I was recently at a worldwide Partner conference. Out of 12,000 attendee's very few of these were women.' (Female IT employee)

'No [barriers exist] but there are no women at senior management level' (Female IT employee)

'I plan to have a family in the upcoming year and I did have to postpone it in order to be 100% [sure] it wouldn't affect my growth. This is something a male employee would never have to do.' (Female IT employee)

As evident in the final quote, female employees still have to contend with work-life balance issue which their male colleagues may not experience. A study carried out by Heilbronner (2013) discussed that women still appear to exit employment due to family commitments. Studies have indicated a lack of female occupying senior roles (Armstrong et al., 2012; Appelbaum et al., 2011a). Of the Irish studies pertaining to females in the IT industry, Cross and Linehan (2006) have researched this topic which depicted a 'glass ceiling' effect existing in the Irish IT industry. This is in contrast to the findings of this research. This impact was studied to discover if a correlation between gender and managerial level exists within the sample. This was studied in Table 1.25 which depicts the Spearman rho correlation results. It is evident that a negative relationship exists, one gender has an opposite reaction to the other when associated with managerial level however this is very minute and has no statistical significance (r=-0.031, p=0.836). Age and managerial level was noted as a very close significance however this was no greater than the ideal 0.05 p-value. Therefore the hypothesis (H3) that men hold a higher proportion of senior roles in IT is null as no difference was discovered. As a result, gender showed no bearing on managerial level achieved in IT.

As previous literature stated, same sex roles models can be a valuable tool to retain current employees (Vogt et al., 2007). The findings of this research suggest that more males acknowledge the presence of same sex role-models within their organisations (Mean=35.87) compared to women (Mean=30.54). However Table 2.12 confirms that the relationship between present same sex role-models and gender is not significant. This finding indicates that there is only a minor difference between whether males and females believe there are same sex role-models within their organisation. Table 1.17 details the age variances in relation to their view on work-life balance policies offered by their company. Ages 18-25 were notably low (n=17, Mean=29.38) compared to those aged 25-36 (n=25, Mean=34.96) and 36-45 (n=12, Mean=35.50). Those aged from 25-45 years would typically have already dealt with or currently be dealing with work-family polices within their organisations which displays a positive correlation. However Table 2.17 rejects any significance between age and work-life balance. These findings indicate no significant association between the two variables.

Work-life balance policies is a constant factor for both male and female employees, however it is traditionally the female who will be affected by this due to the biological nature and social patriarchal influences. Work-family conflict has been known to filter into every field of employment and is a prevalent influence in female career progression (Mavriplis et al., 2010). Glass et al. (2013) concluded that female retention rates were not low as a direct result of family responsibilities and this is corroborated within this research. The findings suggest that while there is a marginal difference between male and female perceptions of work-life balance policies within their companies, the difference indicated that males (Mean=30.97) view their companies as less work-life balance orientated than women (Mean=34.77). This is further confirmed in Table 2.11 that the relationship between these two variables is not significant.

The only statistically significant correlation which was discovered within this research was the relationship between hours worked per week and JS displayed in Table 1.24. Out of the groups with the highest frequency this finding indicates that there is a decrease of almost 7 between the means of employees working 30-39 hours per week (n=22, Mean=35.27) and those working 40-49 hours per week (n=31, Mean=28.50). The extra hours per week has lowered the overall JS of employees. Employees working 50-59 hours per week had the highest recorded JS (n=6, Mean=55.50) however due to the low sample, this may not be as accurate as the previous mentioned groups. The Kruskal-Wallis tests supports this significance (p=0.18) as depicted in Table 2.24.

Limitations

The researcher has assumed that the turnover rates are based on a voluntary basis, therefore avoidable turnover of employees. This indicated that it is the personal perception of the employee in question 'whether their decision could have been prevented' (Morrell et al., 2002, p.163). The researcher did not consider those with traditional beliefs of motherhood. Those with traditional views may voluntarily exit the industry due to their beliefs rather than any influences relating to the industry or organisation. This form of voluntary turnover makes it very difficult to create an effective retention strategy as this is a personal choice framed by society and culture. This would have been difficult to measure within the survey but a question relating to whether participants had always envisioned themselves leaving the workforce to raise children would have helped investigate the respondent's view of leaving the industry. Participants did have an option to state why they may reduce their working hours in the coming years however not one respondent mentioned work-family conflict as a reason.

The biggest limitation of this research would be the reliability of the scale used. Despite keeping the survey open for one month and emailing over 550 potential participants, the response to the survey

was lower than expected with 79 participants with 14 participants having never worked in Ireland. After excluding those 14 respondents, the overall viable participants to 65 and of those only 47 were employed within the IT industry. The researcher acknowledged that the sample size within this study is low and therefore does not accurately reflect the entire industry's view. Based on the abundance of literature correlating gender and retention rates, the sample size would be the most important contributing factor affecting investigating the possible impacts on retention rates in IT. A greater sample would have generated a more reliable finding for this research.

CHAPTER SEVEN

CONCLUSIONS AND RECOMMENDATIONS

This chapter will provide an overview of the research and the impacts of the findings. Recommendations will also be mentioned in line with acknowledgments of research areas of further research as well as reiterating the limitations of this research.

There is a wide array of literature stating that global issues exist in relation to female retention rates in STEM. This strongly indicates that it is an industry culture or social perception surrounding the STEM fields which influences perceptions of female employed or studying STEM. This in turn has been acknowledged to affect female self-efficacy of STEM subjects. However once these females enter the workforce they have been found to exit the STEM field at a faster rate than females employed in non-STEM fields (Glass et al., 2013). The goal of this research was to investigate the influences affecting women in IT upon entering the workforce and discover any impacts on retention rates. Evidence of low female retention rates within the STEM field was found in a multitude of countries around the world, with Europe, India and Northern America contributing the most to this topic within litter reference to Ireland. These global studies found a significant problem in retaining female employees within the STEM field as it is evident that many female employees exit the STEM field and rejoin the workforce in a non-STEM field. Based on the low international retention rates of women in IT, the objective of this research was to investigate whether these issues translate to Ireland as well.

This research found no evidence to support these aforementioned retention influences as an issue on Irish soil. There were no correlations found between gender and intent to exit the industry, against perceived barriers to participation for female employees, presence of same sex role-models in their industry or difficulties achieving a work-life balance. Managerial level had no bearing on gender as was hypothesised by the researcher and age did not appear to impact female retention rates.

An Irish study investigating the factors affecting retention rates of the IT sector on a much grander scale is encouraged. Given the time constraints of this study and a low response rate, further research would be beneficial to analyse what/if any impact gender has on retention rates in the Irish IT sector. As discovered within the research, there is reason to believe that females under 35 years of age may have a higher JS than those over 35 years of age. Although this was disproved as a significant probability, this mirrors previous research and so may be evident in Ireland if further research is carried out.

The researcher did consider targeting females from the non STEM field in order to compare whether there were any statistical differences between those female STEM employees and female non-STEM employees. It is acknowledged that this may be an additional avenue to be explored in the future however its inclusion was understood to potentially alter the sample size in the direction of non-STEM respondents rather than those employed within STEM due to the researchers access to non-STEM participants is greater than those within STEM. The researcher felt this may distract away from the overall research question of female retention rates within the IT field. This area would be recommended in order to assess whether the IT industry has an effect on retention rates compared to females employed in non-STEM industries and could yield interesting results on a larger scale.

APPENDIX 1 – EXAMPLE OF QUESTIONNAIRE

This questionnaire is being completed as part of my MA in Human Resource Management at NCI. The aim of the study is to investigate the motivations of people working within the STEM (Science, Technology, Engineering and Mathematics) field. The survey will take approximately 5 minutes. Please note that all the information is strictly confidential and is only used for the purpose of my research. Should you wish to contact me further, please do not hesitate: caroline.thornton@student.ncirl.ie. Thank you for taking the time to complete this survey.

Please state your consent to take part in this survey*
I agree to take part in this survey and understand that I can withdraw at any time
○ Yes

About You
What is your gender?*
○ Male
○ Female
○ Other:

What is your age?*
○ 18-25
○ 26-35
○ 36-45
○ 46-55
○ 56-65
○ Over 65

What is your highest level of education achieved?*
○ Primary School
○ Secondary School
○ Certificate or Diploma
○ Bachelors Degree
○Postgraduate or Masters
○ Doctorate- PhD
○ Other:

Please indicate whether you currently work or have previously worked in Ireland*
○ I have/do work in Ireland
○ I have never/do not work in Ireland

Which best describes the industry you work in?*
○ Science
○ Information Technology
○ Engineering
○ Mathematics
○ None of the above

What is the title of your current role?*

Is your highest level of education related to your current role?*
○ Yes
○ No

Please indicate your level of managerial hierarchy:*
○ Top Level (e.g. CEO, director, department head etc.)
○ Senior Level (e.g. manager, supervisor etc.)
○ Middle Level (e.g. non management, team member etc.)
○ Entry Level (e.g. graduate etc.)

How long have you been with your current employer?*
Approximate number of years

How many hours do you typically work per week?*
○ Below 19 per week
○ 20-29 per week
○ 30-39 per week
○ 40-49 per week
○ Over 50 per week

You and your workplace

Work-life Balance*

Please indicate to what extent each statement applies to your current organisation

	Strongly Disagree	Mostly Disagree	Somewhat Disagree	Neither Agree not Disagree	Somewhat Agree	Mostly Agree	Strongly Agree
In general, managers are quite accommodating of family-related needs	○	○	○	○	○	○	○
Higher management encourages supervisors to be sensitive to employees' family and personal concerns	○	○	○	○	○	○	○
Middle managers and executives are sympathetic toward employees' child care responsibilities	○	○	○	○	○	○	○
In the event of a conflict,	○	○	○	○	○	○	○

managers are understanding when employees have to put their family first							
Employees are encouraged to strike a balance between their work and family lives	○	○	○	○	○	○	○
Middle managers and executives are sympathetic toward employees' elder care responsibilities	○	○	○	○	○	○	○
This organisation is supportive of employees who want to switch to less demanding jobs for family reasons	○	○	○	○	○	○	○
It is generally okay to talk about one's family at work	○	○	○	○	○	○	○
Employees can easily balance their work and family lives	○	○	○	○	○	○	○
This organisation encourages employees to set limits on where work stops and home life begins	○	○	○	○	○	○	○
It is very hard to leave during the workday to take care of personal or family matters	○	○	○	○	○	○	○
Many employees are resentful when male employees take extended leaves to care for newborn or adopted children	○	○	○	○	○	○	○
Many employees are resentful when female employees take	○	○	○	○	○	○	○

extended leaves to care for newborn or adopted children							
Employees who participate in available work–family programs (e.g., job sharing, part-time work) are viewed as less serious about their careers than those who do not participate in these programs	○	○	○	○	○	○	○
To turn down a promotion or transfer for family-related reasons will seriously hurt one's career progress	○	○	○	○	○	○	○
Employees who use flextime are less likely to advance their careers than those who do not use flextime	○	○	○	○	○	○	○
To get ahead, employees are expected to work more than 50 hours a week, whether at the workplace or at home	○	○	○	○	○	○	○
Employees are often expected to take work home at night and/or on weekends	○	○	○	○	○	○	○
Employees are regularly expected to put their jobs before their families	○	○	○	○	○	○	○
To be viewed favourably by top management, employees must constantly put their jobs ahead of their families or	○	○	○	○	○	○	○

personal lives							

Do you anticipate altering your working hours in the coming years?*

○ I plan to reduce my working hours

○ I plan to increase my working hours

○ No

On my present job, this is how I feel about...

	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied
Being able to keep busy all the time	○	○	○	○	○
The chance to do different things	○	○	○	○	○
The chance to work alone on the job	○	○	○	○	○
The chance to be somebody	○	○	○	○	○
Supervisors handle employees well	○	○	○	○	○
Supervisors competent at making decisions	○	○	○	○	○
Being able to do things not against my conscience	○	○	○	○	○
The job provides steady employment	○	○	○	○	○
The chance to tell people what to do	○	○	○	○	○
The chance to make use of my abilities	○	○	○	○	○
Good company policies	○	○	○	○	○
Fair pay	○	○	○	○	○
Good chance for advancement	○	○	○	○	○
Freedom to use my own judgement	○	○	○	○	○
The chance to use my own methods	○	○	○	○	○
Good working conditions	○	○	○	○	○
Co-Workers get along with each other	○	○	○	○	○
Praise for doing a good job	○	○	○	○	○
The feeling of accomplishment from the job	○	○	○	○	○

There are same sec role-models in my company*

	1	2	3	4	5	6	7	
Disagree	○	○	○	○	○	○	○	Agree

How likely would you be to move industries in the future?*

	1	2	3	4	5	6	7	
Not likely	○	○	○	○	○	○	○	Very likely

If likely to move industries, why?
Please give a brief explanation of your answer

Do you think there are barriers to participation for women within your industry?
Please give a brief explanation of your answer

APPENDIX 2

Submission of Thesis to Norma Smurfit Library, National College of Ireland

Student name: Caroline Thornton Student number: 13101935

School: School of Business Course: MA HRM (Part-Time)

Degree to be awarded: MAHRM

Title of Thesis: Exploring the Difficulties Facing the Retention of Women in the IT Sector in Ireland

One hard bound copy of your thesis will be lodged in the Norma Smurfit Library and will be available for consultation. The electronic copy will be accessible in TRAP (http://trap.ncirl.ie/), the National College of Ireland's Institutional Repository. In accordance with normal academic library practice all theses lodged in the National College of Ireland Institutional Repository (TRAP) are made available on open access.

I agree to a hard bound copy of my thesis being available for consultation in the library. I also agree to an electronic copy of my thesis being made publicly available on the National College of Ireland's Institutional Repository TRAP.

Signature of Candidate: _____

For completion by the School:
The aforementioned thesis was received by_____ Date:_____

This signed form must be appended to all hard bound and electronic copies of your thesis submitted to your school

REFERENCES

Appelbaum, S. H., Asham, N. And Argheyd, K. (2011a) 'Is the glass ceiling cracked in information technology? A qualitative analysis (part 1).' *Industrial and Commercial Training*, 43(6): pp.354-361.

Appelbaum, S. H., Asham, N. And Argheyd, K. (2011b) 'Is the glass ceiling cracked in information technology? A qualitative analysis (part 2).' *Industrial and Commercial Training*, 43(7): pp.451-459.

Armstrong, D. J., Nelms, J. E., Riemenschneider, C. K. and Reid, M. F. (2012) 'Revisiting the Barriers facing Women in Information Systems.' *The Journal of Computer Information Systems*, 53(2): pp.65-74.

Ashcraft, C. and Blithe, S, (2009) 'Women in IT: The Facts.' [Online]. *National Center for Women & Information Technology (NCWIT).* Available from: http://www.ncwit.org/sites/default/files/legacy/pdf/NCWIT_TheFacts_rev2010.pdf [Accessed 21st June 2015]

Black, S., Jameson, J., Komoss, R., Meehan, A., and Numerico, T. (2005) 'Women in Computing: a European and International Perspective.' [Online]. *Third European Symposium on Gender and ICT: Working for Change.* Available from: http://webcache.googleusercontent.com/search?q=cache:uExOcsL0GecJ:https://www.cs.tcd.ie/~smcginns/enrolments/black.doc+&cd=10&hl=en&ct=clnk&gl=ie [Accessed 15th October 2014].

Bryman, A. and Bell, E. (2011) *Business Research Methods*. 3rd Edition. Oxford: Oxford University Press.

Central Statistics Office (CSO) (2011) 'Women and Men in Ireland.' *Central Statistics Office (CSO).* Available from: http://www.cso.ie/en/media/csoie/releasespublications/documents/otherreleases/2011/Women,and,Men,in,Ireland,2011.pdf [Accessed 26th January 2015].

Central Statistics Office (CSO) (2013a) 'Press Release Women and Men in Ireland 2013.' [Online]. *Central Statistics Office (CSO).* Available from: http://www.cso.ie/en/newsandevents/pressreleases/2014pressreleases/pressreleasewomenandmeninireland2013/ [Accessed 18th January 2015].

Central Statistics Office (CSO) (2013b) 'Women and Men in Ireland 2013.' [Online]. *Central Statistics Office (CSO).* Available from: http://www.cso.ie/en/releasesandpublications/ep/p-wamii/womenandmeninireland2013/employmentlist/employment/#d.en.65815 [Accessed 26th January 2015].

CIPD. (2008) 'Employer branding: A no-nonsense approach.' *CIPD Guide*, February 2008(4093): pp.1-64.

Collis, J. and Hussey, R. (2009) *Business Research: A Practical Guide for Undergraduate and Postgraduate Students*. 3rd Edition. Hampshire: Palgrave Macmillan.

Cross, C. and Linehan, M. (2006) 'Barriers to advancing female careers in the high-tech sector: empirical evidence from Ireland.' *Women in Management Review*, 21(1): pp.28-39.

Cross, C. (2010) 'Barriers to the executive suite: evidence from Ireland.' *Leadership & Organization Development Journal*, 31(2): pp.104 – 119.

Dalal, R. S. and Credé, M. (2013) 'Job Satisfaction and other Job Attitudes.' [Online]. In: American Psychological Association. *APA handbook of testing and assessment in psychology, Vol. 1: Test theory and testing and assessment in industrial and organizational psychology.* Washington DC: American Psychological Association, pp.675-691. Available from: http://ezproxy.ncirl.ie:2134/ehost/pdfviewer/pdfviewer?sid=6941a33b-fee3-4ef0-8472-8945dc6e5b71%40sessionmgr114&vid=2&hid=107 [Accessed January 29, 2015].

Delaney, L., Gubbins, S. A., Redmond, C., Harmon, C. and O'Carroll, A. (2013) 'Gender at a glance: Evidence from the Irish Universities Study.' [Online]. *Irish University Association (IUA).* Available from: http://www.iua.ie/wp-content/uploads/2013/08/IUS-04-2013-Gender-At-A-Glance.pdf [Accessed 18th January 2015].

Demerouti, E. (1999) 'Oldenburg Burnout Inventory.' [Online]. *Psyctests.* Available from: http://web.a.ebscohost.com/ehost/pdfviewer/pdfviewer?sid=4dcbeb8d-efe5-4811-9d03-a875dda8b4cd%40sessionmgr4003&vid=18&hid=4109 [Accessed 15th June 2015].

Department of Jobs, Enterprise and Innovation (2014) 'ICT Skills Action Plan: Government, Education and Industry working together to make Ireland a global leader in ICT talent 2014-2018.' [Online]. *Department of Jobs, Enterprise and Innovation.* Available from: http://www.ictireland.ie/Sectors/ICT/ICT.nsf/vPages/Papers_and_Sector_Data~ict-skills-action-plan-2014-14-03-2014?OpenDocument [Accessed 21st June 2015]

Dimitriadi, A (2013) 'Young women in science and technology: the importance of choice.' *Journal of Innovation and Entrepreneurship*, 2(5): pp.1-14.

Drury, B. J., Siy, J. O. and Cheryan, S. (2011) 'When Do Female Role Models Benefit Women? The Importance Differentiating Recruitment From Retention in STEM.' *Psychological Inquiry*, 22(4): pp.265-269.

Durska, M. (2009) 'Diversity management: key concepts.' *Kobieta i Biznes*, no. 1-4, pp.36-41.

Foster, J. J. (2001) *Data Analysis: Using SPSS for Windows*. 1st ed. London: Sage Publications Ltd.

Glass, J., Sassler, S., Levitte, Y. and Michelmore, K. M. (2013) 'What's So Special about STEM? A Comparison of Women's Retention in STEM and Professional Occupations.' *Social Forces*, 92(2): pp.723-756.

Groeneveld, S. (2010) 'Diversity and employee turnover in the Dutch public sector: does diversity management make a difference?' *International Journal of Public Sector*, 24(6): pp.594-612.

Hall, L. (2010) '"The problem that won't go away": Feminity, motherhood and science.' *Women's Studies Journal*, 24(1): pp.14-30.

Heilbronner, N. H. (2013) 'The STEM Pathway for Women: What Has Changed?' *Gifted Child Quarterly*, 57(1): pp 39-55.

Hunt, G. (2015) 'Why we need more women in tech (infographic).' [Online]. *Silicon Republic.* Available form: https://www.siliconrepublic.com/careers/2015/08/12/why-we-need-more-women-in-tech-infographic [Accessed 15th August 2015]

Irish Software Association (2014) 'Confidence up... Revenues up... Exports up...! Indigenous Technology Companies continue to scale their Businesses ..[Online]. *Irish Software Association (ISA).* Available from: http://www.software.ie/Sectors/ISA/ISA.nsf/vPages/Knowledge~Sectoral_Knowledge~isa-digital-technology-index---june-2014-27-06-2014/$file/ISA+DTI+June%2714+final.pdf [Accessed 18th January 2015].

James, L. and Mathew, L. (2012) 'Employee Retention Strategies: IT industry.' *SCMS Journal of Indian Management*, 9(3): pp.79-87.

Kelloway, E., Gottlieb, B., and Barham, L. (1999) 'Work and Family Conflict Scale.' [Online] *Psyctests*. Available from: http://web.a.ebscohost.com/ehost/pdfviewer/pdfviewer?sid=4dcbeb8d-efe5-4811-9d03-a875dda8b4cd%40sessionmgr4003&vid=15&hid=4109 [Accessed 15th June 2015].

Lawrence, J. H., Cells, S., Kin, H. S., Lipson, S. K. and Tong, X. (2014) 'To stay or not to stay: retention of Asian international faculty in STEM fields.' *Higher Education*, 67(5): pp.511-351.

Levine, D. M., Stephan, D. F., Krehbiel, T. C. and Berenson, M. L. (2008) *Statistics for Managers: Using Microsoft Excel.* 5th ed. New Jersey: Prentice Hall.

London, B., Rosenthal, L., Levy, S. R. and Lobel, M. (2011) 'The Influences of Perceived Identity Compatibility and Social Support on Women in Non-traditional Fields During the College Transition.' *Basic and Applied Social Psychology*, 33(4): pp.307-321.

Mackay, A., (2007) *Recruiting, Retaining and Releasing People; Managing redeployment, return, retirement and redundancy*, Oxford: Elsevier Ltd.

Marchington, M. And Wilkinson, A., (2002) *People Management and Development; Human Resource Management at Work.* 2nd ed. London: Chartered Institute of Personnel and Development.

Mavriplis, C., Heller, R., Beil, C., Dam, K., Yassinskaya, N., Shaw, M. and Sorensen, C. (2010) 'Mind the Gap: Women in STEM Career Breaks.' *Journal of Technology Management & Innovation*, 5(1): pp.140-151.

McCoy, S. and Smyth, E. (2011) 'Higher education expansion and differentiation in the Republic of Ireland.' *Higher Education*, 61(3): pp.243-260.

McGrath Cohoon, J. Wu, Z. and You, W. (2006) 'International and US citizen women.' *Equal Opportunities International*, 25(8): pp:629-641.

Michie, S., and Nelson, D. L. (2006) 'Barriers women face in information technology careers: self-efficacy, passion and gender biases.' *Women in Management Review*, 21(1): pp.10-27.

Morrell, K.M., Loan-Clarke, J. and Wilkinson, A.J.. (2004) 'Organisational change and employee turnover.' *Personnel Review*, 33(2): pp.161-173.

OECD (2011) 'ICT employment (indicator).' [Online]. *Organisation for Economic Co-operation and Development (OECD).* Available from: http://data.oecd.org/ict/ict-employment.htm [Accessed on 25 January 2015].

OECD (2013) 'OECD Economic Surveys: Ireland 2013.' [Online]. *OECD.* Available from: http://www.keepeek.com/Digital-Asset-Management/oecd/economics/oecd-economic-surveys-ireland-2013_eco_surveys-irl-2013-en#page4 [Accessed on 25 January 2015].

Oireachtas (2013) 'Open Ireland; open hearts, open minds, open Ireland.' [Online]. *Oireachtas.* Available from: http://www.oireachtas.ie/parliament/media/committees/jobsenterpriseandinnovation/OPEN-IRELAND---WHITE-PAPER.pdf [Accessed 26 January 2015].

Pallant, J (2013) *SPSS Survival Manual: A step by step guide to data analysis using IBM SPSS*. 5th Edition. Berkshire: Open University Press.

Poor, C. J. and Brown, S. (2013) 'Increasing Retention of Women in Engineering at WSU: a Model for a Women's Mentoring Program.' *College Student Journal*, 47(3): pp.421-428.

Quan, J. and Cha, H. (2010) 'IT certifications, outsourcing and information systems personnel turnover.' *Information Technology & People*, 23(4): pp: 330-351.

Quesenberry, J. L. and Trauth, E. M. (2012) 'The (dis)placement of women in the IT workforce: an investigation of individual career values and organisational interventions.' *Information Systems Journal*, 22(6): pp.457-473.

Rhoton, L. A. (2011) 'Distancing as a Gendered Barrier: Understanding Women Scientist's Gender Practices.' *Gender and Society*, 25(6): pp.696-716.

Rosenthal, L., London, B., Levy, S. R. and Lobel, M.(2011) 'The roles of perceived identity compatibility and social support for women in a single-sex STEM program at a co-educational university.' *Sex Roles*, 65(9-10): pp.725-736.

Rugg, G. and Petre, M. (2007) *A Gentle Guide to Research Methods*. 1st ed. Berkshire: Open University Press.

Ryan, S. and Harden, G. (2014) 'Job Embededness of Information Technology Professionals: The Effects of Gender.' *The Journal of Computer Information Systems,* 54(4): pp.52-59.

Saunders, M., Lewis, P., and Thornhill, A. (2009) *Research Methods for Business Students*. 5th ed. Essex; Pearson Education Ltd.

Shapiro, C. A. and Sax, L. J. (2011) 'Major Selection and Persistence for Women in STEM.' *New Direction for Institutional Research*, 2011(52): pp.5-18.

Simard, C. and Gilmartin, S. K. (2010) 'Senior Technical Women: A profile of success.' [Online]. Anita Borg Institute for Women and *Technology*. Available from: http://www2.tku.edu.tw/~tfstnet/upload/file/20120531111204404d78.pdf [Accessed 15th October 2014].

Simpskins, S. D., Davis-Keane P. E. and Eccles, J. S. (2006) 'Maths and Science Motivation: A Longitudinal Examination of the Links between Choice and Beliefs.' *Departmental Psychology*, 42(1): pp:70-83.

Sinha, C. and Sinha, R. (2012) 'Factors Affecting Employee Retention: A Comparative Analysis of the two Organizations from Heavy Engineering Industry.' *European Journal of Business and Management*, 4(3): pp.145-162.

Smith, J. L., Lewis K. L., Hawthorne, L. and Hodges, S. D. (2012) 'When trying Hard Isn't Natural: Women's Belonging With and Motivation for Male Dominated STEM Fields As a Function of Effort Expenditure Concerns.' *Personality and Social Psychology Bulletin*, 39(2): pp.131-143.

Syed, J. and Kramer, R. (2009) 'Socially responsible diversity management.' *Journal of Management & Organisation*, 15(5): pp.639-651

Taneja, S., Pryor, M. G. and Oyler, J. (2012) 'Empowerment and Gender Equality: The Retention and Promotion of Women in the Workforce.' *Journal of Business Diversity*, 12(3): pp.43-53.

Taylor, S. (2010) *Resourcing and Talent Management*. 5th ed. London: Chartered Institute of Personnel and Development.

Testa, M. R. (2001) 'Organizational Commitment, Job Satisfaction, and Effort in the Service Environment.' *The Journal of Psychology*, 135(2): pp.226-236.

Thompson, C., Beauvais, L., and Lyness, K. (1999) 'Work-Family Culture Scale.' [Online]. *Psyctests.* Available from: http://web.a.ebscohost.com/ehost/pdfviewer/pdfviewer?sid=4dcbeb8d-efe5-4811-9d03-a875dda8b4cd%40sessionmgr4003&vid=12&hid=4109 [Accessed 15th June 2015].

Trauth, E. M., Quesenberry, J. L. and Huang, H. (2008) 'A Multicultural Analysis of Factors Influencing Career Choice for Women in the Information Technology Workforce.' *Journal of Global Information Management*, 16(4): pp.1-50.

Valcour, M .(2007) 'Satisfaction with Work-Family Balance Scale.' [Online]. *Psyctests.* Available from: http://web.a.ebscohost.com/ehost/pdfviewer/pdfviewer?sid=4dcbeb8d-efe5-4811-9d03-a875dda8b4cd%40sessionmgr4003&vid=27&hid=4109 [Accessed 15th June 2015].

Vogt, C., Hocevar, D. and Hagedorn, L. S. (2007) 'A Social Cognitive Construct Validation: Determining Women's and Men's Success in Engineering Programs.' *The Journal of Higher Education*, 78(3): pp.337-363.

Weiss, D, Dawis, R, England, G, & Lofquist, L 1967, 'Minnesota Satisfaction Questionnaire--Short Form.' [Online] *Psyctests*, Available from: http://web.a.ebscohost.com/ehost/pdfviewer/pdfviewer?sid=4dcbeb8d-efe5-4811-9d03-a875dda8b4cd%40sessionmgr4003&vid=9&hid=4109 [Accessed 15th June 2015].

Whitney, T., Gammal, D., Gee, B., Mahoney, J. and Simard, C. (2013) 'Priming the Pipeline: Addressing Gender-Based Barriers in Computing.' *IEEE Computer Society,* 46(3): pp.30-36.

CIPD REFLECTION

Throughout the undertaking of this research, I have learnt that published articles are an invaluable source which can shape the primary foundation. However, this research does not necessarily mean that the research founded within said article will apply to your organisation. The findings in my research were not what were hypothesised and this was surprising compared to the wealth of literature available on the subject. Although the results were unexpected, the significance of a reliable scale has been highlighted based on the low response rate achieved.

The entire process was a learning experience. Familiarising myself with the layouts, the content and the data analysis is a skill which I will be able to bring forward into every facet of report writing. In the future, if I were to consider a role in R&D this dissertation will be an invaluable asset which will stand to me. This research has developed skills and recognised areas which need further consideration throughout different stages of the process. This experience will be beneficial in a professional capacity as it demonstrates the knowledge, determination and diligence necessary to achieve a Masters degree.