Employee Engagement and Site Closure

An investigation of employee engagement levels within the closedown of an Irish pharmaceutical plant, using quantitative research methodologies.

Masters of Arts in Human Resource Management

Alex Sheehan

Student Number 13116070

Supervisor: Ron Elliott

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Abstract

Recent trends in management consultancy and a drive for cost reduction across many industries has focused on employee engagement as a source of competitiveness with many management consultancies offering engagement measurement and interventions.

Research into productivity in a site closure scenario highlights the existence of the 'closedown effect' where production improves during site closure, particularly in the presence of timely notification, the provision of a severance package, employee outplacement support and training and development allowance. This research points to high levels of employee engagement during the closure.

High levels of employee engagement during a site closure would appear counterintuitive. This study is based on a sample of 125 employees being made redundant in an Irish pharmaceutical plant.

Using a quantitative questionnaire and the UWES-9 instrument; it explores employee engagement levels but fails to identify any relationship between engagement and demographic factors. The study identifies the impact of a training allowance on employee engagement and lastly investigates why employees themselves believe maintaining engagement is important in the face of redundancy.

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02th September 2015

Table of contents

Employee Engagement and Site Closure i
Abstract ii
Submission of Thesis and Dissertation Declaration Form iii
Submission of Thesis to Norma Smurfit Library, National College of Ireland iv
Acknowledgements v
Table of contents vi
List of Figures ix
List of Tables x
Section 1: Introduction 1
Section 2: Literature review 6
2.1 Introduction 6
2.2 The closedown effect 7
2.3 Defining engagement 8
2.4 Performance studies, motivation and employee engagement 11
2.5 The psychological state of engagement 15
2.6 The impact of training and development on employee engagement 16
2.7 The psychological contract and its impact on employee engagement 21
2.8 Major themes when reviewing employee engagement research 22
2.7 Conclusion - engagement and closedown 23
Section 3: Methodology 25
3.1 Overview 25
3.2 Rationale for selecting quantitative methodologies 25
3.2 Research objectives 27
3.3 Piloting and delivery of survey 31
3.4 Ethical considerations 31

3.5 The closedown effect in Pharma plant X 32
3.3 Demographics in Pharma plant X 33
Section 4: Results 34
4.1 Validity of measurement tool 34
4.2 Generation of engagement score 35
4.3 Overall response rate and engagement levels on site 35
4.3.1.1Engagement levels and gender 37
4.3.2 Engagement levels and union status 40
4.3.3 Engagement levels and age 43
4.3.4 Engagement levels and service 47
4.3.5 Engagement levels and functional area 50
4.3.6 Engagement levels and educational level 54
4.3.7 Engagement and further education whilst working 58
4.4 Impact of the training allowance on engagement levels 61
4.4.1 Impact of the training allowance and education level 65
4.4.2 Impact of the training allowance and age 66
4.4.3 Perception of the training allowance impact and functional area 67
4.5 Employees ranking of the importance of remaining engaged 68
4.5.1 Ranking of the importance of remaining engaged by gender. 70
4.5.2 Ranking of the importance of remaining engaged by union status. 71
4.5.3 Ranking of the importance of remaining engaged by functional area. 72
Section 5: Discussion 73
5.1 Introduction 73
5.2 The engagement measure 73
5.3 Engagement levels and demographics 74
5.3.1 Hypothesis 1 74
5.3.2 Hypothesis 2 74
5.3.3 Hypothesis 3 78
5.3.4 Hypothesis 4 78

5.3.5 Hypothesis 5 79
5.3.6 Hypothesis 6 79
Section 6: Conclusions and limitations 80
Section 7: Recommendations 82
Personal Learning Reflection 84
Appendix 1: Descriptive statistics engagement and gender 85
Appendix 2: Descriptive statistics engagement and union status 86
Appendix 3: Descriptive statistics engagement and age 87
Appendix 4: Descriptive statistics engagement and service 88
Appendix 5: Descriptive statistics engagement and functional area 89
Appendix 6: Descriptive statistics engagement and education level 90
Appendix 7: Descriptive statistics engagement and further education while working 91
Appendix 8: Descriptive statistics engagement and impact of the training allowance 92
Appendix 9: Reasons for maintaining engagement by gender score 93
Appendix 10: Reasons for maintaining engagement by union status score 93
Appendix 11: Reasons for maintaining engagement by functional area score 94
References: 95

List of Figures

Figure 1: Employee engagement as defined by business consultants (Willard, 2010) 9
Figure 2: Hertzberg's model of motivation (Bosman, 2011) 13
Figure 3: Shuck and Wollard definition of employee engagement (Verint, 2009) 16
Figure 4: Overview of site functional areas 33
Figure 5: Total engagement distribution 36
Figure 6: Engagement levels male distribution 37
Figure 7: Engagement levels female distribution 37
Figure 8: Engagement levels unionised group distribution 40
Figure 9: Engagement levels non-unionised group distribution 40
Figure 10: Engagement levels 18 to 35 years old 44
Figure 11: Engagement levels 36 to 45 years old 44
Figure 12: Engagement levels 46 to 55 years old 44
Figure 13: Engagement levels aged 56 and over 44
Figure 14: 1 to 10 years' service engagement distribution 48
Figure 15: 11 to 20 years' service engagement distribution 48
Figure 16: 21 to 30 years' service engagement distribution 48
Figure 17: Over 31 years' service engagement distribution 48
Figure 18: Engagement levels Maintenance /Utilities distribution 51
Figure 19: Engagement levels Production / IPTs distribution 51
Figure 20: Engagement levels Logistics distribution 51
Figure 21: Engagement levels Quality distribution 51
Figure 22: Engagement levels Engineering / Safety distribution 51
Figure 23: Engagement levels GTO / Finance distribution 51
Figure 24: Engagement and leaving certificate 55
Figure 25: Engagement and third level diploma 55
Figure 26: Engagement and qualified craftsperson 55
Figure 27: Engagement and third level degree 55
Figure 28: Engagement and third level masters 55
Figure 29: Engagement and doctorate / post doc 55
Figure 30: Engagement level and further education while working distribution 59
Figure 31: Engagement level and no further education while working distribution 59
Figure 32: Engagement and impact of the training allowance 62

List of Tables

Table 1: Pharma plant X; key performance indicators 32
Table 2: Case processing scale reliability 34
Table 3: Reliability of measurement instrument 35
Table 4: General description of engagement levels 36
Table 5: Case study; engagement and gender 37
Table 6: Engagement and gender normality test 38
Table 7: Mann-Whitney ranking gender 39
Table 8: Mann-Whitney test gender 39
Table 9: Engagement and union status, case processing 40
Table 10: Union status, test for normality 41
Table 11: Union status, independent samples test 42
Table 12: Engagement and age groups, case processing 43
Table 13: Age groups, test for normality 45
Table 14:Kruskal Wallis ranking age groups 46
Table 15: Kruskal Wallis test age groups 46
Table 16: Engagement and service, case processing 47
Table 17: Service group, test for normality 49
Table 18: Kruskal Wallis ranking service groups 49
Table 19: Kruskal Wallis test service groups 49
Table 20: Engagement and functional area, case processing 50
Table 21: Functional area, test for normality; 52
Table 22: Kruskal Wallis ranking functional area 53
Table 23: Kruskal Wallis test functional area 53
Table 24: Engagement and education level, case processing 54
Table 25: Education level, test for normality 56
Table 26: Kruskal Wallis ranking education level 57
Table 27: Kruskal Wallis test education level 57
Table 28: Engagement and further education while working, case processing 58
Table 29: Further education while working, test for normality 59
Table 30: Kruskal Wallis ranking, further education while working 60
Table 31: Mann-Whitney test, further education while working 60
Table 32: Impact of training allowance on maintaining engagement 61
Table 33: Engagement and impact of training allowance, case processing; 62
Table 34: Impact of training allowance, test for normality; 63
Table 35: Kruskal Wallis ranking, impact of training allowance 64
Table 36: Kruskal Wallis test impact of training allowance 64
Table 37: Impact of training allowance and education level, case processing 65
Table 38:Chi-Square test, impact of training allowance and education level 65

Table 39: Impact of training allowance and age, case processing 66
Table 40: Chi-Square test, impact of training allowance and age..... 66
Table 41: Impact of training allowance and functional area, case processing,..... 67
Table 42: Chi-Square test, impact of training allowance and functional area 67
Table 43: Overall ranking of reasons for maintaining engagement..... 69
Table 44: Ranking reasons for maintaining engagement with gender..... 70
Table 45: Ranking reasons for maintaining engagement by union status..... 71
Table 46: Ranking of reasons for maintaining engagement and functional area..... 72

Section 1: Introduction

While productivity and motivation at work has been studied for many years it has received increasing focus in recent times as companies search for a means of providing competitive advantage (Harter, Schmidt, Killham and Asplund, 2006), especially in times of economic downturn (Federman, 2010). However there is less research available on productivity and motivation during a plant closure. Research has provided evidence that, contrary to expectations, productivity improves during the closedown process in some plants, a phenomenon referred to as the 'closedown effect' (Bergman and Wigblad, 1999). This unexpected but beneficial business outcomes, has led to recent interest in the closedown effect.

Much of this research focuses on the cause of the closedown effect. Some research indicates that the increase in production levels may be due to a relaxation of management control which in turn fosters greater employee innovation (Bergman and Wigblad, 1999) and greater employee autonomy (Wigblad, Hansson, Townsend and Lewer, 2012). Whilst other research suggests that employees adopt new career goals which initially displace (Gandolfi and Hansson, 2010) and ultimately replace the organization's goals (Häsänen, Hellgren and Hansson, 2011). This research argues that the replacement of the organization's goals with individual goals increases employee engagement levels which in turn lead to better performance (Häsänen, Hellgren and Hansson, 2011). Some of the research also suggests that employees display greater efforts in an ultimately futile attempt to stave off the closure of the site (Bergman and Wigblad, 1999).

While there is some debate as to the cause of the performance increase during the closedown, its existence has been empirically proven. The research concludes that in the absence of corporate social responsibility (CSR), an initial dip in performance is typical in the advance notice period prior to a plant closedown, but a statistically significant closedown effect is evident during the actual closedown process with or without appropriate CSR practices (Hansson and Wigblad, 2006). A continuation of this research defines appropriate CSR as including: early notification of the closedown, severance

payments, outplacing assistance and educational or development programs (Rydell and Wigblad, 2012). This research however does not detail the extent of the training programs, its relationship with employee engagement or its contribution to the closedown effect. In fact uptake of training programmes can be poor with recent data indicating only 60% uptake (Bailey, Bentley, de Ruyter and Hall, 2014). However, the research does indicate that early announcement of a plant closure combined with appropriate CSR provides a better return for the company than short notice unexpected closures, in that the company can expect to benefit from the closedown effect (Hansson and Wigblad, 2006).

Employee engagement and productivity is also a popular area of research (Saks, 2006). Some researchers, albeit typically those with a vested interest, or a product to sell (Briner, 2014), claim that employee engagement is a significant indicator of productivity as well as a major influence in creating competitive advantage (Harter, et al., 2006).

With employee engagement playing such a major role in productivity and the existence of the 'closedown effect' it is reasonable perhaps to conclude that a site in the process of closure, where improved or sustained productivity is evident should exhibit high levels of employee engagement. It is also plausible that if productivity has remained stable and all functional groups contribute somewhat equally to the plant productivity, that the engagement levels should be relatively homogeneous across the site irrespective of functional area or demographic differences.

The announcement of a plant closure and lay-offs could reasonably be expected to lower engagement levels and cause significant disruption, given the social and individual consequences of impending job loss, in fact the perceived negative consequences are considered dire enough to have supported the practice of short notice closures and stealth lay-offs across different industries to both minimize the visibility of the lay-offs and to limit any counterproductive behavior (Gandolfi and Hansson, 2010). Indeed the emotional response to the term redundancy has led to an ever increasing vocabulary and terminology in relation to closures and lay-offs which seek to avoid the use of the term redundant and substitute less obvious terms including retrenchment, redesign and reorganization which have a less obvious link to employee terminations (Gandolfi and Hansson, 2010).

Some research has looked at the factors influencing employees' reactions to the closure both in terms of their satisfaction with the communication in relation to the closure, the severance package being offered by the company and their organizational attitudes after the closure announcement. This has been done in an attempt to determine if the employees' reaction to the impending redundancy is affected by how the employees perceive their future employability and their length of service with the company (Stengård, Bernhard-Oettel, Näswall, Ishäll and Berntson 2014). This research examined the individual's situation and organizational attitude and was able to generate data in relation to the employee's attitudes to the severance package and their obligation to the company. Interestingly the data highlighted that those employees most satisfied with the severance package actually demonstrate lower levels of organization obligation due to the severance package actually providing sufficient security to allow the employee to start to disconnect from the company (Stengård et al., 2014), the research however did not examine employee's engagement levels but rather their attitude towards the company.

This study seeks to contribute to the existing research by measuring employee engagement in a plant going through the close-down process and investigating if there are any demographic correlations to engagement levels on the site. The study will also investigate if the provision of a training allowance impacts employees' engagement levels, and lastly will examine why the employees themselves believe that maintaining engagement levels may be important.

Pharma plant X is being closed in late 2016; the announcement of the closure was made in April 2013 thus complying with the 'early notice' requirement of previous research. Pharma plant X instituted a redundancy package including, severance pay, outplacing assistance, a performance related bonus with specific targets for batch delivery, quality and safety, plus a training and development allowance to help employees increase their future employment prospects and maintain engagement.

As suggested by previous research, a close down effect is evident in that the plant continues to meet and exceed targets for production, safety and quality. However, whilst the closedown effect is evident, there is no existing evidence to suggest that the performance is related to employee engagement, if engagement levels are influenced by

gender, functional area or length of service or in fact if the engagement levels on site are impacted in any way by the closure. There is also no evidence of a relationship between the provision of the training and developmental allowance with employee engagement levels.

The concept of employee engagement has led to numerous scholarly debates particularly around the lack of agreement on a definition of employee engagement (Little and Little, 2006) and whether the concept of employee engagement is an independent construct at all or merely a repackaging or amalgamation of several job related constructs such as satisfaction, intention to stay and motivation (Shuck and Wollard, 2010). The existence of engagement as a separate construct is not the focus of this study, nor is the study an investigation into the nature or definition of engagement. This study, in the literature review, will look at the historical development of the construct and explore some of the debate around it but only to enable the selection of a construct that can be operationalized and measured consistently. Once defined, and a suitable measure identified, the study will explore the engagement levels of employees and employee subgroups on site. It will also investigate if there is a relationship between the training allowance and engagement levels as suggested in the earlier research of Hansson and Wigblad (2006).

The examination of employee engagement during the closure may assist companies in determining if targeted engagement interventions for specific demographic or functional groupings are required. The investigation of an employee's perception of the training allowance and its impact on their engagement levels could assist companies facing a closedown to determine if the provision of a training allowance is an appropriate or effective method for maintaining employee engagement.

Another benefit of the study is the generation of data with the potential to influence those employees of the organization that are not being made redundant. A site closure is not only traumatic for employees of the closing site, it also has a significant effect on the remaining employees in the organization; the handling of the closure and the attitudes of those being made redundant has a significant impact on those remaining behind (Chipunza and Berry 2010)

In the example of Pharma plant X, there are 5 other sites in Ireland remaining within the corporation, and there is significant interaction between those being made redundant in plant X and those remaining in the other sites over the course of the extended closure period. The treatment of the employees of plant X by the organization will impact not only on companywide engagement levels, but also the company brand and the value proposition of the organization in Ireland for the future. The data generated by this study could be significant in helping the organization influence the survivors and ultimately achieve the aims of the closure.

Lastly the study will add to the existing research on both the closedown effect and employee engagement and help to bridge the gap between the research areas. The study will provide data in an Irish context which is lacking in closedown research which has a predominantly Scandinavian influence. The study will provide employee engagement data during closure which can be correlated to other engagement studies which use the same measurement instrument.

Section 2: Literature review

2.1 Introduction

The purpose of this section is to explore the concept of employee engagement and its link to productivity, and particularly the closedown effect. Whilst employee engagement as has gained attention particularly in the last ten years (Briner, 2014), employee motivation, employee performance and job satisfaction have been studied for many years and these constructs have been linked with, mistaken for, and used interchangeably with employee engagement throughout existing literature. Due to the inconsistency in the definition of engagement in literature this review will include a brief review of productivity and motivation studies and the subtle transformation to employee engagement studies. The review will also explore the debate surrounding the engagement construct that still permeates any discussion of employee engagement.

Initially the review aims to build an understanding of the closedown effect, what it actually is, the environment required to promote it and how it is linked with employee engagement.

The researcher will then identify the major themes from engagement studies, and use the existing literature to identify a specific construct that can be operationalised to investigate engagement levels within a plant closure which is a significant gap in current engagement literature. A second gap the study will address in both engagement and closedown literature is a lack of empirical data within the Irish context.

Another focus of this section is to explore any relationship between training and development, the psychological contract and employee engagement. The review will investigate the impact of redundancy on the psychological contract plus the influence that training and development may have in maintaining the psychological contract and employee engagement during the closedown.

2.2 The closedown effect

The closedown effect is the name given to the phenomenon of increased productivity in a plant going through closure; its existence has been proven empirically and research has demonstrated that the effect is reliable enough to be predicted (Hansson and Wigblad, 2006). This research was carried out by examining several different industry types in Scandinavia to prove that the effect is not specific to a particular industry or worker type, however this research did not cover either the pharmaceutical industry or the Irish manufacturing sector. The research demonstrated that in the initial lead in to the closure announcement that a dip in productivity is experienced but that with appropriate CSR and early notice of the intent to close, that the initial productivity dip is not present and the closedown effect is evident in all stages of the closure process (Hansson and Wigblad, 2006).

There has been much research into the effects of job loss including empirical evidence of both physical ill health and psychological effects including depression and marital problems (Gandolfi and Hansson, 2010). Given these consequences the closedown effect is counterintuitive and surprising.

Plant closures and layoffs are seen by the employee as a violation of the psychological contract between themselves and their employer, where the employer supplied job security and the employee reciprocated with company loyalty (Hendry and Jenkins, 1997). Some research has suggested that the nature of the psychological contract is changing, with less expectation by the employee of secure long term employment with a single company (Beaumont and Harris, 2002). However, older employees with long service are unlikely to have made this change which could indicate that age and service levels would affect engagement levels in a closedown scenario. Even with a shift in the nature of the psychological contract, there is empirical evidence of a loss of trust after redundancy that is significant enough for the employee to take to their next employer (Macky, 2004).

The current economic environment of multiple closures and the impact of redundancy make research into the closedown effect particularly relevant. This study will add to the

research by specifically investigating employee engagement levels during a plant closure where the closedown effect is evident.

While research has demonstrated that a closedown effect can be anticipated in both socially responsible (SR) and non-SR closedowns (Hansson and Wigblad, 2006), the role of employee engagement within the effect has not been empirically examined. Much of the research into employee engagement or motivation in terms of redundancy has been focused on those who remain behind with the organization. It is these survivors that are required to deliver the returns in the case of corporate right-sizing (Gandolfi and Hansson, 2010), which is dependent on the reaction of the survivors to the way the redundancies are managed by the company (Saunders and Thornhill, 1998).

In the case of Pharma plant X, 5 other sites in the corporation are located in Ireland. The management of the closure and redundancies will impact the survivors on the other Irish sites and ultimately affect the corporate goal behind the closure. Engagement levels and the attitude of those being made redundant at Pharma plant X who are in continuous contact with their colleagues on the surviving sites will therefore impact the effectiveness of the closure.

This research study will provide empirical data on engagement levels within the cohort actually being made redundant, but continue to deliver and meet production targets whilst in the process of closing, which is a gap in existing closedown literature.

2.3 Defining engagement

A common theme in modern HR and business consulting is that competitive advantage can be leveraged from employee engagement, and that performance and increased profit can be achieved through the discretionary effort and motivation of employees (Harter et al., 2006). The second major theme of business consulting is that engagement leads to greater effort from the employee and greater commitment to the organization as depicted below in Figure 1. The limitations of the practitioners' offerings however is that the exact definition of engagement is vague other than its purported outcomes, and there is no

allowance for engagement without organizational commitment which is unlikely in a closedown scenario.

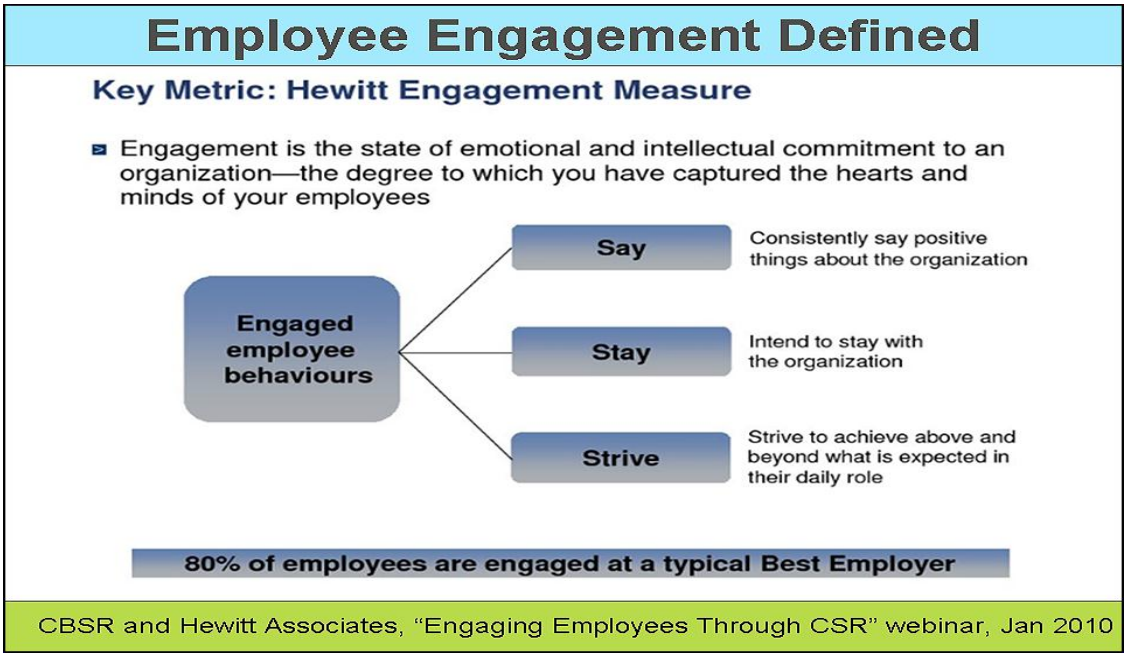

Figure 1: Employee engagement as defined by business consultants (Willard, 2010)

Whilst practitioners have similar offerings, academics unfortunately have had little agreement on the exact meaning or a definition of employee engagement and there are very few empirical studies to draw evidence from (Shuck and Wollard, 2010). This lack of agreement and empirical evidence hampers the development and understanding of engagement therefore this section seeks to identify a singular construct from the literature that can be adopted for this study.

Much of the existing literature on employee engagement is contradictory with one proposal that employee engagement is a function of the employee taking accountability (Millar, 2012), whilst other research indicates that engagement is the consequence of goal setting and achievement (Meyer, Becker and Vandenberghe, 2004). As there is no clear agreement on the definition of engagement (Briner, 2014) it's not surprising that engagement has been operationalized and measured using many different factors making the literature difficult to follow (Schaufeli and Bakker, 2010).

The confusion around the construct has led to some claims that engagement is not a construct of its own but a repackaging of previous research on job satisfaction, organisational commitment and work involvement (Little and Little, 2006, Schaufeli and Bakker, 2010). The lack of academic research and agreement on the topic has allowed practitioners such as The Gallup Organisation and Towers Perrin, as well as professional societies including The American Society for Training and Development, the Corporate Leadership Council and the society for Human Resource Management, to fill the void and define engagement to suit their own purposes and products (Shuck and Wollard, 2010, Macey and Schneider, 2008). Practitioners however have adopted a unitarist view of the employer / employee relationship with engagement achieved through communication of, and commitment to, an aligned set of individual and company goals (Sambrook, Jones and Doloriert, 2014). Whilst the research is comprehensive and plausible when applied to a normal working environment, increased commitment to the company by an employee being made redundant is unlikely. Secondly, alignments of individual goals to company goals (which include making the individual redundant) are unlikely; therefore in the researcher's opinion these are not primary drivers of employee engagement during a closedown.

A further complication in defining employee engagement is that the literature is inconsistent is agreeing whether employee engagement should be measured at an individual level or an organizational level and indeed if measuring engagement in an employee's work is the same as measuring an employee's engagement with their organization (Ferreira and Real de Oliveria, 2014). Whilst there is evidence that engagement can be operationalized and measured at an organizational level (Alagaraja and Shuck, 2015) there is enough evidence and empirical studies performed to support the use and study of the construct at an individual level (Schaufeli and Bakker, 2010).

Much of this research at the individual level focuses on the psychological aspects of engagement, and how immersed in the role the employee becomes. Whilst sometimes inconsistent there is some general agreement that engagement is a psychological state which can lead to particular desired behaviors and drive performance (Gruman and Saks, 2011, Shuck and Reio, 2011). The research suggests that engagement provides a measure

of the employee's enthusiasm for the work as well as their satisfaction and involvement in the work (Harter, Schmidt and Hayes, 2002). This branch of research starts to separate engagement from the traditional motivation constructs and provides some clarity to the problem of employees being able to be engaged in their work, while at the same time not being particularly motivated by it. This distinction between motivation and engagement is critical to investigating productivity in general and specifically productivity during a site closure. There has however been a significant journey to reach this point of separation which is briefly outlined below.

2.4 Performance studies, motivation and employee engagement

Some of the earliest research into work motivation and performance is the field of 'scientific management' and 'management by objectives' which looked in detail at the tasks that workers perform, standardizing the tasks to eliminate waste and making the work as efficient as possible (Taylor, 1911). This task management was built upon with coaching and feedback to ensure each employee delivers to required standards of quantity and quality (Locke, 1978). This resonates strongly in modern lean manufacturing practices, with standardized work, level loading and waste removal being the cornerstones of the Toyota Production System from which most lean six sigma manufacturing methodology originates (Abdulmalek and Rajgopal, 2007, Hines, Holweg and Rich, 2004). A gap in lean manufacturing in however is the focus on process improvement, whilst ignoring the employee's engagement with the task beyond learning to perform the task efficiently.

A second theory into performance at work is Expectancy Theory (Vroom, 1964) which postulates that performance is a result of the employee expectancy that effort will yield results, which in turn are instrumental in bringing rewards that have value to the employee (Locke and Latham, 1990). If the assumption is made that the concepts of value and reward remain reasonably constant for an employee then performance will be directly related to the expectation of the individual that effort will yield results (Garland, 1984).

While expectancy theory postulates on the antecedents of performance it does not include employee engagement as a prerequisite, and the theory has yet to be proven empirically. The academic stance that productivity is only mediated by the expectancy of rewards would seem to be very limiting however and the assumption by previous researchers that the employee's value and reward framework remains constant is flawed in the researcher's opinion, as the value placed on a particular reward is likely to change during the employee's lifecycle and particularly in a closedown scenario.

In the 1950s needs fulfillment was researched by Maslow (1954) who developed a hierarchy of needs. This postulated that humans have needs that can be categorised and arranged in a hierarchy and that there is a requirement to meet the needs at the lower more basic levels before moving up through the hierarchy (Maslow, 1954). Employment and security are some of the basic needs in the hierarchy, whilst esteem and achievement and self-actualization are higher order needs (Maslow, 1954). This would suggest that having a secure job and financial security will have a large influence on employee motivation, particularly in a redundancy or closedown situation. Whilst Maslow's seminal work has stood the test of time, it doesn't provide insight into the engagement construct, and would suggest that during a closedown only financial and security considerations will be critical to the employee, contradicting the notion of engaged employees increasing productivity during closedown. This highlights the importance of separating motivation and engagement.

The linking of an individual's intrinsic motivation or needs to job design became popular in the 1970s and early 1980s under the umbrella of the 'Needs–Satisfaction Models of Job Attributes' and whilst popular there was little empirical evidence to support it as a means of driving job satisfaction and no proven link to engagement (Salancik and Pfeffer, 1977). Other researchers looked specifically at the individual's needs in relation to the work environment and postulated that there are two factors influencing how people feel about work (Herzberg and Snyderman, 1959). These factors summarized in Figure 2 below are categorised as extrinsic hygiene factors including working conditions, style of supervision and pay which can lead to dissatisfaction, but not satisfaction, and intrinsic factors or motivators such as recognition, responsibility, advancement and achievement, which

directly affect satisfaction (Herzberg and Snyderman, 1959). Employee engagement is not mentioned as either an intrinsic or hygiene factor by Hertzberg. Engagement practitioners however list management style, working conditions, recognition and responsibility among others as the antecedents of employee engagement (Harter et al., 2006). This could indicate that either Hertzberg's model is incorrect, and the model has in fact been criticised in terms of methodology and simplicity (Dunnette, Campbell and Hakel, 1967), or that practitioners are confusing motivation with engagement, or lastly and most likely that practitioners choose elements of motivation and engagement that not only allow ease of measurement, but also provide suitable opportunity to provide engagement interventions and consultancy fees and are less concerned with being consistent with accepted models such as Hertzberg's.

Figure 2: Hertzberg's model of motivation (Bosman, 2011)

In the mid 1980's Self-Determination Theory (SDT) built further on needs and goal attainment. SDT is based on the relationship between the individual's psychological needs and the reason for performing the task (Ryan and Deci, 2000). SDT defines intrinsic motivation as being internally focused where the desire to perform the task is generated

from the individual's interest or enjoyment of the task whereas extrinsic motivation stems from an external locus and is driven by a desire for an external reward, or outcome, this research is very aligned with expectancy theory discussed earlier, but SDT suggests that intrinsic motivation was much more successful in goal achievement than extrinsic motivation (Ryan and Deci, 2000). Similar to expectancy theory this research focused on the motivation to perform the task and not necessarily engagement with the task, however the model suggests that the motivation behind the task is a greater influence on productivity than engagement contradicting the proposal that engagement can drive productivity.

Other research went beyond intrinsic and extrinsic motivations and looked at the conditions of the work environment and the impact that these had on employee engagement. This research defined engagement as being emotionally, cognitively and physically involved while performing tasks and identified three conditions called meaningfulness, safety and availability that must exist for the employee to be engaged in the role (Kahn, 1990). The condition of meaningfulness requires that the employee feels that role has meaning and will yield a return on the investment for their effort, and that the employee feels they can invest their true self in the role (Kahn, 1990). This research was further explored in more detail and indicated that of the three conditions, the condition of meaningfulness has the strongest relationship with employee engagement (May, Gilson and Harter, 2004). Whilst this research has identified meaningfulness as the key condition influencing engagement, the research explores the employees psychological connection to the role without providing a measurement of the concept (Schaufeli, Salanova, Gonzalez-Romá and Bakker, 2002), thus while pivotal and still considered seminal in respect to engagement studies, as it starts to separate motivation from engagement, it does not provide a link from engagement to productivity.

2.5 The psychological state of engagement

Further research on engagement expanded on Kahn's investment of self into the role and defined engagement as a frame of mind and longer term psychological state or condition of the employee, and not necessarily role orientated (Schaufeli et al., 2002). This branch of research initially identified vigor and dedication as the dimensions of engagement while further research identified a third dimension absorption, and concluded that it is organizational factors rather than personal factors or demographics that impact on work engagement (Simpson, 2009). This would suggest that in Pharma plant X demographics should not overtly influence engagement levels and would suggest a consistent profile of engagement across different functional groups and cohorts. Much of this recent research was performed specifically in relation to burnout and the role that motivation plays in reducing burnout but the research places burnout and engagement on the same spectrum (ten Brummelhuis, ter Hoeven, Bakker and Peper, 2011) and therefore burnout can be used in inverse to investigate engagement. The research into burnout starts the move from academic models to a construct that can be measured and this branch of research provides the first quantitative measures that can be associated with engagement.

Current academic research has started to look into the antecedents of employee engagement, and has identified three drivers, namely cognitive, emotional and behavioral (Saks, 2006). This research has also looked at the outcome of employee engagement, and is the first non-practitioner research to link results with engagement levels (Shuck and Wollard, 2010).

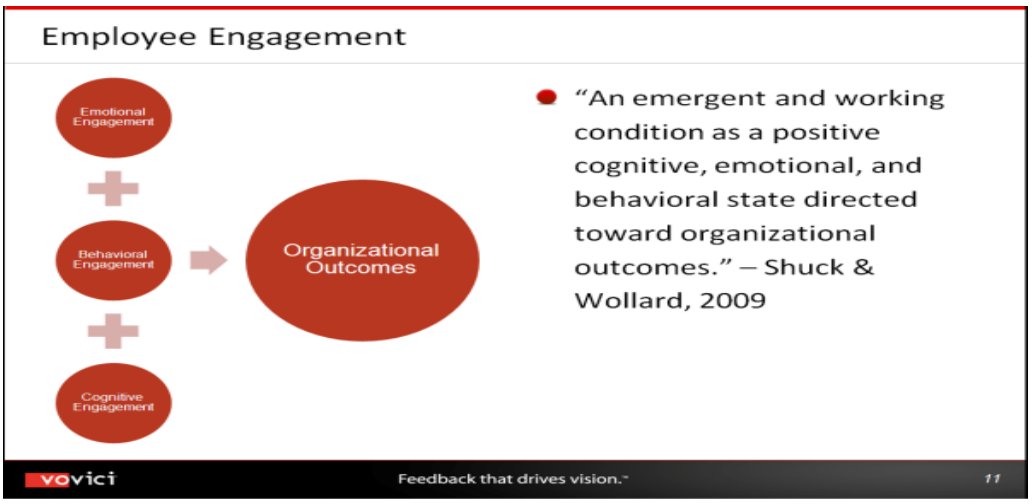

Figure 3: Shuck and Wollard definition of employee engagement (Verint, 2009)

This research has also started to distinguish the older constructs of job satisfaction and organizational commitment as outcomes of, but different from, engagement (Gruman and Saks, 2011). The separation of organizational commitment and job satisfaction is particularly interesting in that this is the first time in engagement research where employee engagement can be present without having organizational commitment or job satisfaction which allows an employee in a closedown to be engaged and potentially productive in their role, without being satisfied in the role and without being committed to the organization that is making them redundant.

2.6 The impact of training and development on employee engagement

In the 1930s researchers began to examine the link between goal attainment, motivation, and intention. Referred to as Goal Setting Theory, this research into motivation is ongoing and there is an argument that goal-setting or goal attainment is fundamental in all motivational research (Locke, 1978). This research has demonstrated that setting specific, difficult, but attainable goals directly regulates performance while increasing job satisfaction and commitment to the organization (Locke and Latham, 1990). The research pays little attention however to training and development outside of the employee being

competent to carry out the task. In a closedown situation however it has been argued that it is the replacement of the organisation's goals with personal goals that drives performance (Häsänen, 2010) and that personal goals have a greater driving effect for the individual than organizational goals (Klein, Wesson, Hollenbeck and Alge, 1999). As training and development may be instrumental in attainment of these personal goals; a training and development allowance may have a positive effect by inducing employee satisfaction and motivation.

Early research into psychological growth and needs of employees is referred to collectively as the cognitive growth school and this school of research has argued that development opportunities have a motivating effect by providing an opportunity for the individual to grow and advance (Locke, 1978). Fulfillment of work related goals and provision for psychological growth and advancement are major drivers of job satisfaction and the effect is so great as to compensate for failure to achieve goals in the individual's personal life (Wiese and Freund, 2005). Therefore the creation of new personal goals could replace older advancement goals or feelings of failure associated with the closedown, and in this way training and development could impact directly on an employee's job satisfaction and motivation during the closure.

As we have outlined previously however while motivation exists in the same space as engagement they have been proven to be different constructs (Schaufeli and Bakker, 2010), and satisfaction cannot be linked to performance as it is possible that some individuals could be extremely satisfied with their jobs while still performing poorly.

Another flaw in the cognitive growth model in respect to a closedown is that advancement within the organization is an unlikely goal in a redundancy situation. This therefore contradicts the proposition that the provision of a training allowance will help to maintain employee engagement and performance unless somehow advancement is translated to increased employment opportunities post closedown.

The impact of training on productivity has led to some academic debate, with some research suggesting that goal setting and feedback alone led to increased productivity whether job satisfaction and motivation increased or not (Umstot, Bell and Mitchell,

1976) and others specifically listing formal training as a means of engaging workers to increase productivity (Sorcher and Meyer, 1969) again this earlier research confuses motivation, satisfaction and engagement and thus provides no link from training to engagement. A further contradiction is that in Hertzberg's research, mentioned earlier, employee development opportunities are listed as one of the extrinsic hygiene factors that do not influence motivation.

These earlier schools of research therefore are contradictory and difficult to relate to a closedown situation. The fulfillment of personal goals may replace meeting corporate goals, and training could facilitate fulfilling these personal goals. Maslow's research however suggests that personal goals are of less importance than basic survival needs (Maslow, 1954) which are more important during redundancy.

Much of the guidance available on improving employee engagement is generated by practitioners and industry societies; the first of which was the Society for Human Resource Management who published guidance on engagement and designing engagement initiatives. While they recommend the provision of challenges and opportunities to employees, they do not specifically list training and development as a tool to generate engagement (Lockwood, 2007). The guidance however, was of limited value as no definition of engagement was given and the recommendations were vague (Shuck and Wollard, 2010).

This was followed by the American Society for Training and Development (ASTD) which was the first research to look specifically at the role of training and development in employee engagement and highlighted that it meets a psychological need and provides greater meaningfulness in the role which in turn helps prevent burnout (Shuck, 2010). This links back to the earlier study by Kahn who had originally identified meaningfulness as one of the three conditions for engagement (Kahn, 1990).

Another branch of research that may link training and development to employee motivation during closedown is Self-Worth Theory, which is based on an individual's psychological need to generate a positive self-image or self–worth, and identifies academic competence as one of the areas that individuals use to provide feelings of self-

worth (Covington, 1998). Although Covington's work was specific to teaching and not the work environment it could be translated to training and development whilst in work especially to individuals who place high value on academic competence (Eccles and Wigfield, 2002), which is typical in the pharmaceutical industry, especially amongst technical employee groups. Individuals who place high value on academic competence may in this instance use training and development to bolster their sense of self-worth which the closedown has damaged. If this is indeed the case there may be a correlation between the impact of the provision of a training and development allowance on employee engagement within the technical functions as opposed to the non-skilled workforce, assuming that technical personnel have a higher proportion of qualified employees who place a higher value on education.

There is a link between meaningful work and Self-Worth Theory in that individuals generate self-worth and a sense of their own identity from career progression which is independent from the company or organization within which the employee works (Fairlie, 2011). In this case the provision of training and development allows the employee to further develop their self-worth which could help to offset the negative impact on the employee's self-image from the impending redundancy irrespective of the value they may have placed on education prior to the closure announcement. A second link is that with impending redundancy the work itself loses meaningfulness, but the loss of meaning in the work could be off-set with training and development which the employee may view as personally meaningful, by increasing personal potential, realizing long held purposes and perhaps depending on the type of training having greater social impact (Fairlie, 2011). In some instances the training and development may allow the employee to become more comfortable with their role and closer to their preferred self which is a major element of employee engagement (Kahn, 1990).

In this way SDT does not preclude the training and development allowance from contributing to the closedown effect, and in fact supports the case that a training and development allowance will be related to employee engagement and could contribute to the closedown effect.

More recent practitioner literature on employee engagement lists training and development as one of the drivers of engagement and Gallups Q12 tool for measuring engagement asks if development is encouraged and if there are opportunities for learning and growing (Harter et al., 2006). However, as Gallup provide engagement interventions and training there is an inbuilt bias in their literature (Briner, 2014). Another complication is the assumption that all employees will benefit to the same extent. Research investigating perceived investment in employee development (PIED) and work performance, concluded that PIED and performance was explained by the correlation between PIED and intrinsic motivation towards development (Kuvaas and Dysvik, 2009). This would suggest that training and development would influence the engagement levels of employees intrinsically motivated by development, rather than other cohorts. In contrast however other research has argued that motivation exists on a continuum with intrinsic and extrinsic at either end of the spectrum, rather than being a condition, and that even extrinsically motivated goals can be internalized by the individual when they believe in and value the outcome (Ryan and Deci, 2000). Therefore in a closedown scenario training and development could be intrinsic motivators for some employees and extrinsic for others. The belief in the outcome, for example greater employability, will help that extrinsic cohort to internalize it and generate motivation, in this way training could be argued to impact all employees and contribute to overall engagement levels.

Social exchange theory would suggest that employees will react positively when they believe that the company is investing in training and developing them (Cropanzano and Mitchell, 2005). However, as the current research has not demonstrated consistent thinking or definition of employee engagement (Macey and Schneider, 2008), it is not surprising that research has not identified any direct relationships. The allowance does however indicate the company's continued good will to those it is terminating, as well as being a legitimate bargaining strategy in severance negotiations. This study hopes to provide some data to further explore the relationship.

2.7 The psychological contract and its impact on employee engagement

A relatively recent area of investigation into workplace behaviors and individuals performance at work is the psychological contract (Sonnenberg, Koene and Paauwe, 2011). The psychological contract has been described as the informal contract between employer and employee, separate and distinct from the legal formal written contract, which describes the organisation's obligations to the employee, as perceived by the employee, in return for the employee meeting their own obligations to the company (Robinson and Rousseau, 1994). An issues with the concept of the psychological contract is that it is primarily dependent on the individual, and the individual's perception of the company's obligations, which means that there are as many variations of the contract within the organization as there are individuals, who will have different perceptions as to when the contract has been violated (Del Campo, 2007). It has however been proposed that with the fostering of common beliefs and assumptions, a set of common psychological contracts become cultural norms and expectations for an organization, which can spread across multiple sites (Rousseau, 1995).

One of the elements of the psychological contract common in literature is implied job security in return for employee loyalty, although recent business practices of corporate mergers and restructuring has led to greater insecurity in recent times, particularly in supervisory or management levels (King, 2000). This has led some researchers to suggest that the psychological contract has moved away from long term job security towards a new contract of long term employability, where the modern worker has less expectation from the organization in relation to long term employment, and more expectation on training and development to enhance long term employability (Hendry and Jenkins, 1997). In this way the provision of a training allowance may support a sense of employability and maintain a new psychological contract, there is however a lack of empirical evidence to illustrate this.

2.8 Major themes when reviewing employee engagement research

The first theme within employee engagement studies is the link from engagement to performance, whilst a lot of the research supporting the link has been generated and reported by practitioners who have a vested interest in the construct (Little and Little, 2006) there is growing interest and a body of academic data also supporting the link (Ferreira and Real de Oliveria, 2014).

The second major theme to emerge from the literature is the discussion on whether engagement is a construct of its own or a repackaging of older concepts (Shuck, Ghosh, Zigarmi and Nimon, 2012) with the more recent literature supporting that engagement is indeed a separate construct (Alagaraja and Shuck, 2015; Hallberg and Schaufeli, 2006) but that it is closely related to and exists in the same space as the older concepts of job satisfaction, involvement and organizational commitment (Shuck et al., 2013). More recent research has succeeded in separating motivation and engagement and identified and defined antecedents or engagement such as meaningful work (Fairlie, 2011) job characteristics, support, resources and rewards (Kumar and Swetha, 2011).

The third theme emerging from recent literature is the growing promotion of the positive psychological nature of engagement and increasing engagement levels rather than just combating negative outcomes such as job burnout (Cole, Walter, Bedeian and O'Boyle, 2012). The positive outcome for the organization being increased organizational commitment, talent retention and alignment with organizational goals (Harter et al., 2006). Organizational commitment and a sense of shared values and goals is a requirement for engagement (Holbeche and Springett, 2003), and fairness and justice combined with meaningful and valued work are conditions required by many to promote engagement, and limit burnout (Maslach, Schaufeli and Leiter, 2001).

There is an abundance of research on plant closedown and reduction in workforce however the focus is on the financial implications to the company, the breaking of the psychological contract and the effects on the survivors (Gandolfi and Hansson, 2010).

Significant gaps however in the literature are employee engagement during closedown and the link between training and development with employee engagement.

2.7 Conclusion - engagement and closedown

Previous research shows that corporate downsizing generally leads to a reduction in trust and motivation in employees leading to reduced productivity (Makawatsakul and Kleiner, 2003) and during a plant closedown the employer violates the psychological contract with the employee (Morrison and Robinson, 1997). Yet research has demonstrated that a closedown effect, increased productivity and employee engagement, can be anticipated in both socially responsible (SR) and non-SR closedowns (Hansson and Wigblad, 2006).

As engagement is one of the key drivers of productivity (Harter et al., 2006), to make the closedown effect possible some elements within the redundancy package and the treatment of employees by management must, it could be argued, be providing the sense of fairness and shared goals that maintain the engagement of the employees. The provision of the training and development allowance could be perceived as a demonstration of commitment by the company to the future of the employee as suggested in social exchange theory, and potentially the training and increased employability could be providing a personal goal in place of traditional corporate goals driving productivity as suggested in goal setting theory. Setting and completing training and development goals, whether intrinsically or extrinsically motivated could increase an individual's confidence and self-worth, as suggested in SDT and Self-Worth Theory. All of these may help employee engagement in a closedown, unfortunately however there is little evidence available and the aim of this paper is to provide some input into the subject.

While many practitioners and some academics espouse training as a means of increasing employee engagement (McManus and Mosca, 2015) there is little empirical academic research or data measuring the effect particularly the engagement levels of those employees facing redundancy.

Similarly there is a lack of agreement relating to specific demographics and engagement. Some research identifies age as a factor in increasing engagement (Kordbacheh, Shultz, and Olson, 2014), while the Gallup organization (Brim, 2007) and the CIPD (Truss, Burnett, Coll, Edwards, Soane and Wisdom, 2006) have identified an inverse relationship between length of service and engagement, suggesting that that engagement diminishes as service increases. This study hopes to provide specific demographic data for engagement within a closedown that will add to the existing literature and help in some small way to fill the void in literature relating to employee engagement during a closedown.

Section 3: Methodology

3.1 Overview

In this section we explore the options and methodology available to perform the study and achieve the research aims, and detail the rationale for selecting a positivist, quantitative approach, the method for collecting the data, the proposed instrument, the sample available and sample size chosen for the study and any important ethical considerations.

The structure of the company and a general outline of the demographics of the company along with the research objectives of the study will be detailed in this section with a number of hypotheses based on these research objectives, the data required to investigate the hypotheses will also be outlined.

3.2 Rationale for selecting quantitative methodologies

Whilst most of the research into the employee engagement construct and the different interpretations and definitions of engagement are based on the psychological aspects of the construct, the study of the closedown effect has been from the positivism school of research and has been empirically and statistically evaluated.

The very nature of engagement being a psychological state, which has proven so difficult to define could be seen as a limitation on quantitative analysis on the subject, as the conditions and behaviors associated with engagement limit the observable measurements possible. Some of the seminal work carried out on the subject by Kahn in 1990 used a qualitative study (Simpson, 2009).

When choosing the appropriate methodology however the researcher must first consider the objectives they hope to achieve. In this study the objective is to examine the relationship between the employee's engagement and demographic factors plus employee

attitudes to the training and development allowance all within the context of a closure rather than exploring engagement as a concept in itself. If a suitable tool can be sourced to measure engagement levels the relationships are observable and measurable supporting quantitative methodology. This is supported by the work of May et al., (2004) where quantitative measures were used to investigate Kahn's psychological construct, as did the research carried out by Schaufeli et al., (2002) when investigating the dimensions within the construct of engagement.

When determining the best approach to the study the researcher must take their own axiological assumptions and presence within the study into account (Saunders,Lewis and Thornhill, 2009). As the researcher is employed within the company that will be the test environment for the study, the researcher is potentially subject to bias (Quinlan, 2011), particularly if taking an interpretive approach to the topic under investigation. The researcher is undertaking the study as part fulfillment of a master's degree in human resource management indicating that the researcher places high value on training and development themselves and is intrinsically motivated towards training and development. As there is a potential for bias with a interpretivist approach, it would suggest that a positivist approach, allowing the researcher to maintain some distance from the phenomena and allow conclusions to be driven from objective observable evidence, would be a more reasonable approach to the study.

A second influence on the study design is the sample type and size available for the study. The plant where the study will be performed currently employs 200 personnel, skilled and unskilled, technical and crafts, both sexes and with a large age spread from early twenties to mid sixty's and service lengths ranging from 3 years to 40 years, thus providing a large potential pool of data. The most efficient data gathering over such a large and varied pool is the use of quantitative surveys; the large mix of employees would necessitate a large group for qualitative interviews or focus groups to ensure that all employee types would be represented. Pharma plant X has begun a phased closedown with the first wave of employees having left the site and a second wave leaving in April 2015. This imposes time constraints on the data gathering element of the project supporting a quantitative methodology to generate the data in a shorter time frame.

A third consideration for choosing either quantitative or qualitative methods is the context in which the research will be carried out. Employees on site have begun the close down process, some employees have already exited, and the next wave of exits are currently involved in outplacement support, including interviewing skills, CV writing, coaching sessions with outplacement and financial specialists, and exit discussions with management and HR. Within this context interviews with the researcher could be confused with the exiting process which is not ethical and also open to misunderstanding by those not chosen as part of the sample. A quantitative survey, sent to all employees, with an accompanying explanation of the purpose of the study in this instance is less likely to be problematic.

The study is being performed in a live environment and is therefore not experimental and thus cannot prove causality. Due to the time limitations discussed earlier a longitudinal study is not possible, therefore a cross-sectional study will be performed. The survey will be sent to all employees to keep the sample size as large as possible.

To perform a quantitative investigation the definition and an appropriate measure for engagement must be selected and the research questions require conversion to hypotheses, which can be tested using a reliable scale.

3.2 Research objectives

Previous research indicates that a closedown effect and increased productivity can be anticipated where appropriate CSR practices are implemented as part of the closedown process to maintain employee engagement, and that CSR would include training and development of employees.

The primary objective of this research is to investigate employee engagement levels during a plant closedown where the ‘closedown effect’ is evident and to explore any demographic relationships with engagement levels to determine if engagement levels can be generalised across the site population.

The research will also investigate the relationship between training and development with employee engagement across different demographic groupings within the closedown process.

Lastly the study will examine the employee's attitudes to engagement by asking why the employees feel that maintaining engagement levels may be important.

These objectives can be examined by determining:

1) Overall engagement levels on site.
2) If any relationship exists between engagement levels and demographic factors including but not limited to, functional areas, length of service and union status.
3) To what extend the employee felt the provision of a training and development allowance impacted on their engagement levels.
4) If level of education, functional area or age correlates to the perceived impact of the training and development allowance on engagement.
5) If those employees who indicate that training and development have a greater impact on engagement are generally more engaged than other employees.
6) The ranking that employees give to particular reasons for maintaining engagement levels.

These and other potential relationships identified could help companies facing closedown in determining and designing appropriate strategies in relation to employee engagement, training and development, and could help further understanding of the closedown effect.

For this study the chosen definition of engagement is based on the work of Schaufeli et al (2006) as a psychological state of vigor, dedication and absorption in work leading to desired behaviors which can drive performance and which provides a measure of the employees, enthusiasm for the work as well as their satisfaction and involvement in the work.

There are many practitioner measures of engagement available the most commonly referenced being the Gallup organisations Q12 questionnaire, which has a Cronbach's alpha of 0.91 at a business unit level (Harter,et al., 2006); however practitioner measures

are prone to bias and are designed to identify potential engagement interventions (Briner, 2014). Another reason for not selecting Gallups Q-12 survey is that on review of the tool by the researcher of the 12 scales in the measure 3 could be problematic.

'Q1: I know what is expected of me at work' as the exiting process has begun at the site, many personnel are changing roles to rebalance the remaining work and start new work specifically associated with the closedown, for example archiving documents and data and decommissioning facilities, this would place a large bias on that scale.

'Q10: I have a best friend at work' as approximately 20% of the workforce have exited since December 2014 this scale is not only open for bias but may cause emotional distress to some employees.

And finally *'Q12: In the last six months somebody has spoken to me about my progress'* as the company performance review cycle was completed in April, with some consternation amongst employees as to its relevance in light of the closedown, this scale is likely to be problematic.

As one of the main elements of our chosen definition was developed based on the work of Schaufeli et al (2006) it would seem appropriate to use the Utrecht work engagement scale that was used in their study by Schaufeli, Bakker, and Salanova in 2006.

The Utrecht Work Engagement Scale – shortened version (UWES-9), has reported Cronbach's alpha of between 0.85 and 0.92 (De Bruin and Henn, 2013) and has been proven reliable over different cultures (Fong and Ng, 2012; Littman-Ovadia and Balducci, 2012) and worker types (Seppälä, Mauno, Feldt, Hakanen, Kinnunen, Tolvanen and Schaufeli, 2009) and as such has been referenced a valid tool yielding reliable scores reflecting the 3-dimensions of the engagement construct (Mills, Culbertson and Fullagar, 2012). The UWES-9 scale focuses on the engagement of the employee with their work rather than the organization (Ferreira and Real de Oliveria, 2014) however this does not impact the validity of the data from this piece of research as the closedown effect is specific to the employee output or productivity rather than organizational commitment.

Therefore the UWES-9 questionnaire was selected to gather data on engagement across the full site sample with a Likert scale to generate specific data in relation to the impact

of the training and development allowance on engagement levels. This data combined with demographic, functional area and service data was used to test the following hypothesis:

H_1. Employees on site generally report poor engagement levels.

H_2. There is no statistically relevant relationship between the engagement level and demographic, functional groupings, or length of service of the employee.

H_3. Employees feel that the training and development allowance is not a significant contributor to maintaining their engagement levels.

H_4. There is no statistically significant relationship between engagement levels and the perceived impact of the training and development allowance.

H_5. There is no statistically relevant relationship between educational level, functional area and age to the perceived contribution that the training and development allowance has on engagement levels.

H_6. There is no significant difference in the ranking of the reasons for maintaining engagement based on gender, union status or functional area.

3.3 Piloting and delivery of survey

Ten individuals who were accessible and familiar to the researcher and who represented, different genders, ages, service and functional area groups were selected to pilot the intended survey. The pilot confirmed that the questions as set out in the UWES-9 instrument were clear, understandable and would not cause any offense to site employees. A small number of minor changes to the demographic questions in the survey were made based on the feedback of the pilot. The survey was circulated on e-mail to all employees on site with a link to 'survey monkey' to collect the data which was exported to Microsoft excel and statistically analysed on 'SPSS' software.

3.4 Ethical considerations

The primary goal of all forms of research is to generate knowledge (Collis and Hussey, 2014) but all studies have ethical considerations. Whilst no ethical issues are predicted, the survey was accompanied with a clear indication that participation in the survey was voluntary, and that the research was being carried out only to support the researchers own personal academic goals and was not related to the company. Respondents were assured of their anonymity and that no data would be retained and that the study results were being made available to the National College of Ireland only.

3.5 The closedown effect in Pharma plant X

The initial question for the study was to determine if the closedown process in Pharma plant X meets the criteria of appropriate CSR practices and to determine if, as predicted in the earlier research, the closedown effect is evident. Site metrics for the period immediately before the announcement, through to the completion of this study are presented in table 1 below.

Year	**Schedule adherence**	**Number of Quality Deviations**	**Number of reportable Safety events**
2012	78	317	16
2013	97	159	4
2014	98	110	1

Table 1: Pharma plant X; key performance indicators

These are three of the main measures that the site uses to determine the performance of the site, the measure the number of batches made versus those planned, the number of quality defects generated and the number of safety and environmental issues encountered. These are the key performance metrics used to determine site performance. The metrics suggest that production performance has improved indicating that closedown effect is evident on site.

3.3 Demographics in Pharma plant X

The requirements of any role on site are dictated by the functional area. Therefore employee qualifications, educational levels and union status differences are best understood and investigated by functional area differences, see Figure 4 below. The production and maintenance functions are mainly unionized and the Global Technical Operations (GTO) group are mainly doctorate level chemists. Gender, age and service differences are not specific to functional areas.

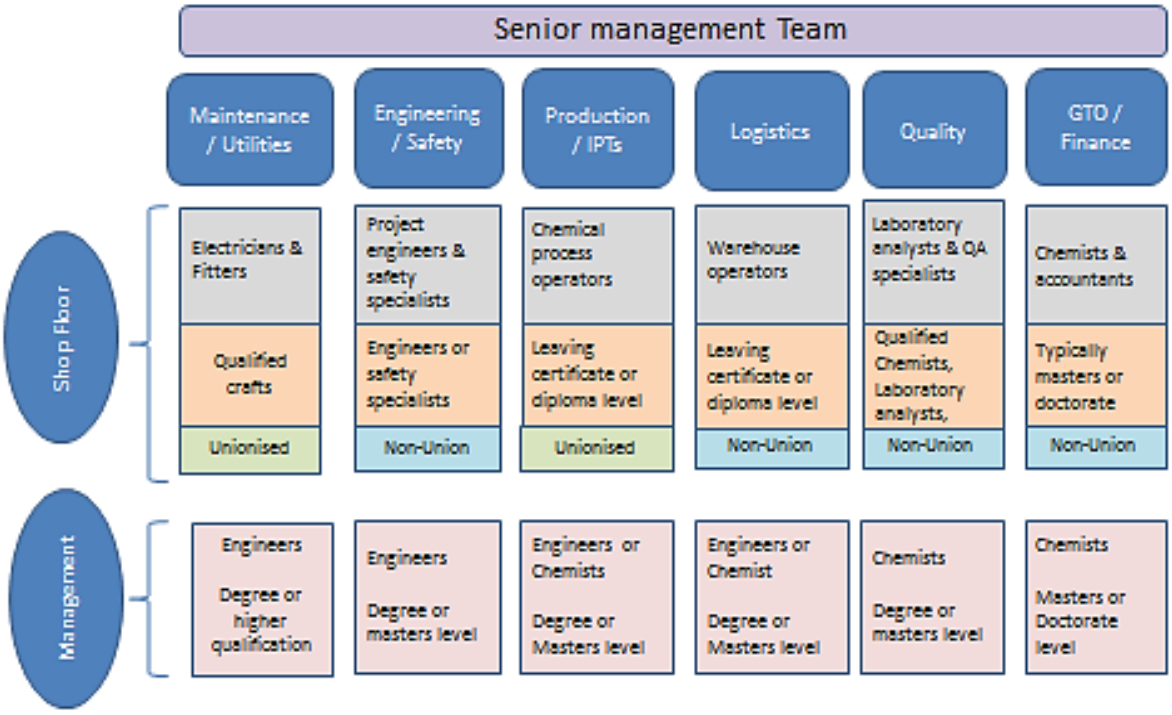

Figure 4: Overview of site functional areas

Section 4: Results

This section presents the data generated and the results of this study and describes the analysis performed to generate the results. Firstly we will discuss the use of the UWES-9 tool and determine the internal validity of the tool, before going on to explore the overall engagement levels on the site and the response rate to the survey. Secondly the engagement results will be examined in relation to demographic factors that might influence engagement levels within the organization before moving on to explore any relationship between engagement levels and employees perception of the training and development allowance, before finally exploring the ranking that employees assigned to presented reasons for maintaining engagement levels. With respect to all of these analyses, the data of each of the variables under consideration is presented and the results of all statistical tests and an assessment of their precondition requirements are also provided.

4.1 Validity of measurement tool

The UWES-9 instrument contains 3 scales, totaling 9 items, and has had been quoted in previous studies as exhibiting internal consistency of greater than 0.7 (Bakker, et al., 2006). Table 2 below contains the case processing indicating the number of respondents and Table 3 contains the reliability measure for the instrument indicating Cronbach's Alpha of 0.922 which validates that the instrument is suitable for use in this study.

Case Processing Summary

		N	%
Cases	Valid	125	98.4
	Excluded[a]	2	1.6
	Total	127	100.0

a. Listwise deletion based on all variables in the procedure.

Table 2: Case processing scale reliability

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.922	.923	9

Table 3: Reliability of measurement instrument

4.2 Generation of engagement score

The aim of the study is to examine the relationship between overall engagement and demographic factors and not the three constituent scales of engagement. The overall engagement score is achieved in accordance with the instructions for the tool by summing each of the items together to generate a total engagement score for the analysis, and is hereafter is referred to as engagement. The aggregating of the scale items to generate an overall engagement score is supported in literature as the preferred mechanism for investigating engagement. (De Bruin and Henn, 2013).

4.3 Overall response rate and engagement levels on site

The headcount of pharma plant X at the time of the data collection was 200. With some personnel in the process of exiting at the time of the data collection; there were 125 respondents to the survey, representing 63% of the total site headcount.

The case summary is presented in Table 4 showing average engagement levels on site of 41.58 and a range of 58. The distribution of engagement is presented in the histogram in Figure 5 and appears to be normally distributed. The horizontal axis of the histogram represents the engagement level with the vertical axis depicting the number of employees for example; 4 respondents have engagement levels below 20.

Statistics

Total Engagement

N	Valid	125
	Missing	2
Mean		41.58
Std. Deviation		10.954
Range		58

Table 4: General description of engagement levels

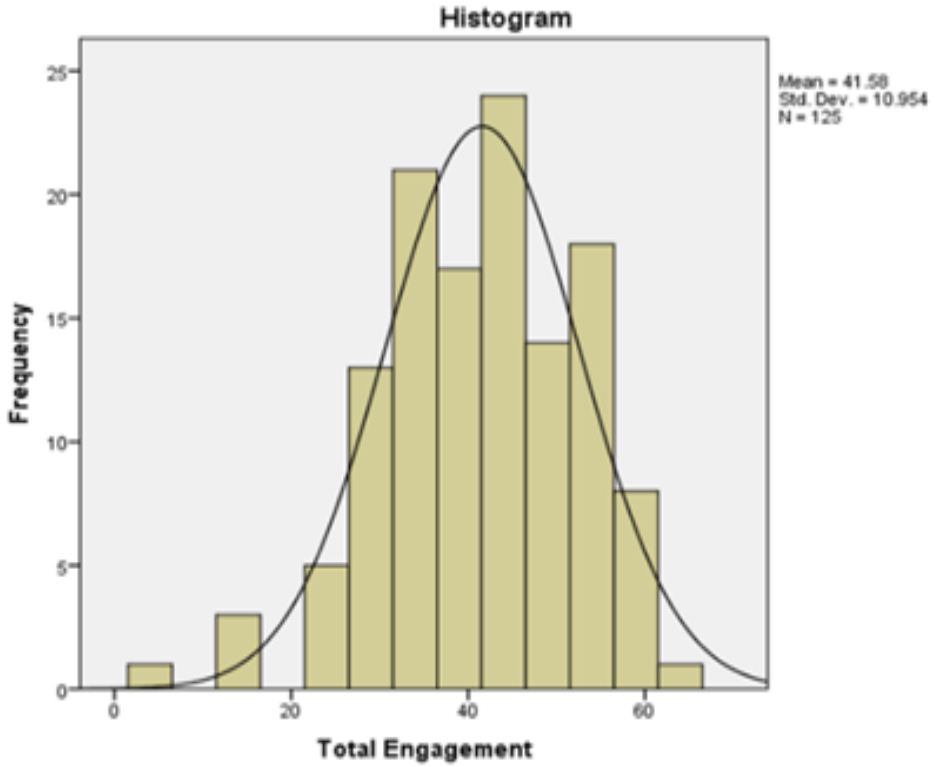

Figure 5: Total engagement distribution

4.3.1.1Engagement levels and gender

Of the 125 respondents of which only 120 indicated their gender 88 were Male and 32 were Female. A case summary for the engagement levels of each gender is presented in Table 5. Histograms of the distributions of engagement levels of both male and female employees are shown in Figures 6 and 7 respectively. In both cases the horizontal axis represents the engagement level of employees with the vertical axis depicting the number of employees with this engagement level. For example, Figure 7 indicates that of the 32 females in the study 2 had engagement levels of 60.

Case Processing Summary

		Cases					
		Valid		Missing		Total	
	Sex	N	Percent	N	Percent	N	Percent
Total Engagement	Male	88	100.0%	0	0.0%	88	100.0%
	Female	32	100.0%	0	0.0%	32	100.0%

Table 5: Case study; engagement and gender

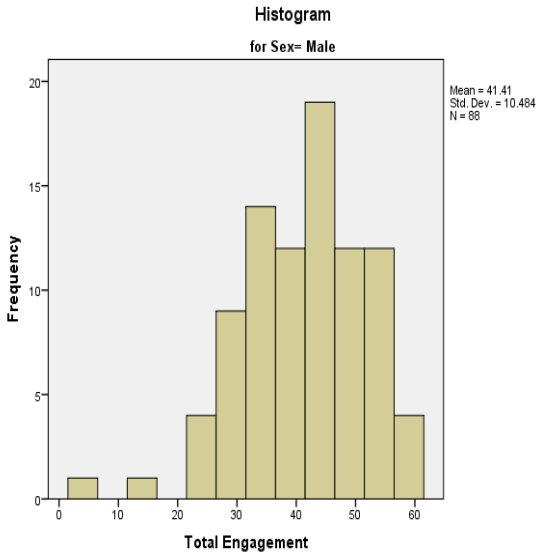

Figure 6: Engagement levels male distribution

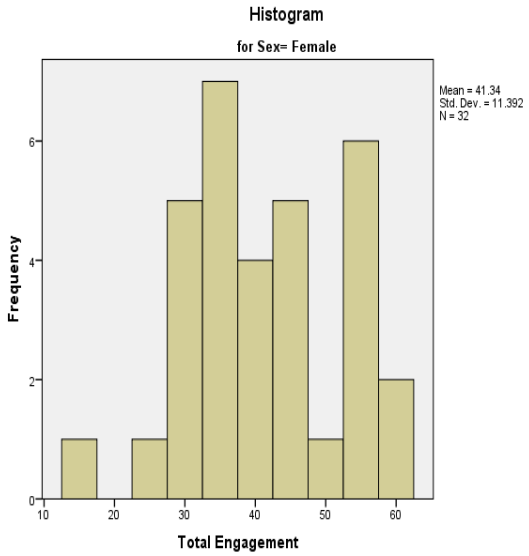

Figure 7: Engagement levels female distribution

All associated descriptive statistics, for both the male and female sample distributions, are shown in Appendix 1. The results indicate little difference in the mean engagement for males at 41.41and females at 41.34 and a large range for both groups at 57 and 47 respectively indicating similar responses across both cohorts.

The results of tests of normality are presented in Table 6. The results of the Shapiro-Wilk's test of normality are relied upon for inferring the presence or absence of normality in both the male and female sample distributions. The null hypothesis associated with the Shapiro-Wilk's test of normality assumes normality of the sample under consideration. Our results indicate a slight deviations from normality for the male sample **(W_{MALE} = .969, df = 88, p = .033)**, with the female sample exhibiting normality **(W_{FEMALE} = .960, df = 32, p = .270)**. In all analysis used in the study an alpha level of 0.05 was selected for all statistical tests.

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Sex	Statistic	df	Sig.	Statistic	df	Sig.
Total Engagement	Male	.064	88	.200*	.969	88	.033
	Female	.117	32	.200*	.960	32	.270

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 6: Engagement and gender normality test

Due to identified deviations in normality for the male sample, the Mann-Whitney U test was utilised to determine if significant differences exists in mean ranks of both groups. The null hypothesis associated with the Mann-Whitney U test being one of no difference. The results of this test are shown in Tables 7 and 8. The results of the Mann-Whitney U test indicate that there exists no significant differences between the engagement levels of males **(Mdn=60.93)** compared to females **(Mdn=59.33)**, **(U = 1370.0, p = .824).**

Ranks

	Sex	N	Mean Rank	Sum of Ranks
Total Engagement	Male	88	60.93	5361.50
	Female	32	59.33	1898.50
	Total	120		

Table 7: Mann-Whitney ranking gender

Test Statistics[a]

	Total Engagement
Mann-Whitney U	1370.500
Wilcoxon W	1898.500
Z	-.223
Asymp. Sig. (2-tailed)	.824

a. Grouping Variable: Sex

Table 8: Mann-Whitney test gender

4.3.2 Engagement levels and union status

Of the 125 respondents only 121 indicated their union status of which 35 were union members and 86 were not. A case summary for the engagement levels of each category is presented in Table 9. Histograms of the distributions of engagement levels of union and non-union groups are shown in Figures 8 and 9 respectively. In both cases the horizontal axis represents the engagement level of employees with the vertical axis depicting the number of employees with this engagement level. For example, Figure 4 indicates that of the 35 unionised colleagues in the study 1 had engagement level of 60.

Case Processing Summary

		Cases					
		Valid		Missing		Total	
	Union status	N	Percent	N	Percent	N	Percent
Total Engagement	Unionised	35	100.0%	0	0.0%	35	100.0%
	Non unionised	86	100.0%	0	0.0%	86	100.0%

Table 9: Engagement and union status, case processing

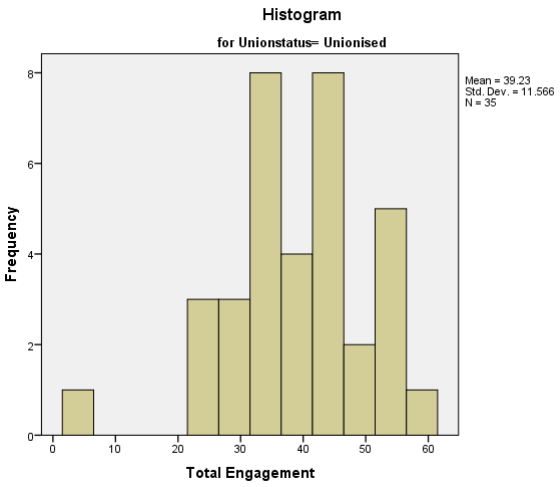

Figure 8: Engagement levels unionised group distribution

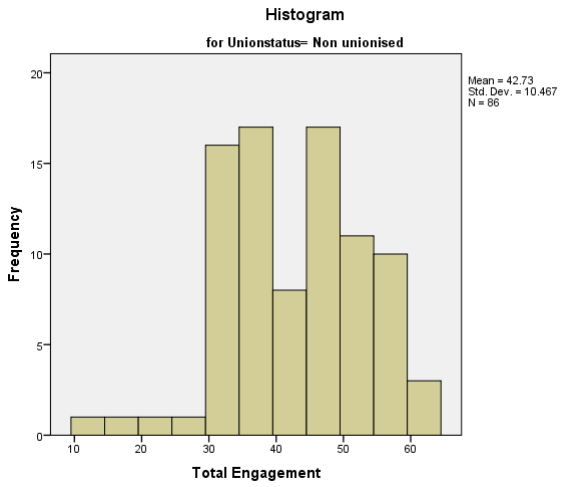

Figure 9: Engagement levels non-unionised group distribution

All associated descriptive statistics, for both the Unionised and Non-Unionised groups, are shown in appendix 2. Although the mean engagement score for the unionised colleagues at 39.23 is lower than the mean on the non-unionised cohorts at 42.73, the large ranges at 55 and 50 respectively indicates a high degree of overlap and similarity between the groups.

The results of tests of normality are presented in Table 10. The results of the Shapiro-Wilk's test of normality are used for inferring the presence or absence of normality in with a null hypothesis assuming normality of both samples under consideration. Our results indicate normality for both the union and nonunion samples respectively, **($W_{unionised}$ = .961, df = 35, p =.253)**, **($W_{Non\ unionised}$ = .973, df = 86, p = .068)**.

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Union status	Statistic	df	Sig.	Statistic	df	Sig.
Total Engagement	Unionised	.070	35	.200*	.961	35	.253
	Non unionised	.070	86	.200*	.973	86	.068

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 10: Union status, test for normality

As both groups exhibit normality, an independent-samples t-test was conducted to compare the engagement levels in Unionised and Non-Unionised groups. The null hypothesis for the independent sample-t test is that there is not a significant difference in the samples.

The results of the test are presented below in table 11 and indicate that there was not a significant difference in the engagement levels of the unionised group **(M=39.23, SD=11.566)** and the non-unionised group **(M= 42.73, SD= 10.467)** conditions; **t (119) = -1.619, p = 0.108**

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Total Engagement	Equal variances assumed	.124	.726	-1.619	119	.108	-3.504	2.164	-7.789	.781
	Equal variances not assumed			-1.552	57.872	.126	-3.504	2.257	-8.023	1.015

Table 11: Union status, independent samples test

4.3.3 Engagement levels and age

On analysis of the data generated for age it revealed that there was only a single respondent in the age category 18 to 25. As a single response in this category would interfere with the analysis this age category was combined with the next age category of 26 to 35 to provide a reasonable sample size for analysis. This readjustment provides four new age groupings for analysis. The new age groupings provide sample sizes of at least 14 allowing meaningful analysis. The case summary for the 4 new groupings is presented in Table 12. Histograms of the distributions of engagement levels of each age category are shown in Figures 10, 11, 12 and 13 respectively. The horizontal axis represents the engagement level of employees with the vertical axis depicting the number of employees with this engagement level. For example, Figure 7 indicates that of the 32 females in the study 2 had engagement levels of 60.

Case Processing Summary

		Cases					
		Valid		Missing		Total	
	NewAgeGroup	N	Percent	N	Percent	N	Percent
Total Engagement	18 to 35 years old	18	100.0%	0	0.0%	18	100.0%
	36 to 45 years old	60	100.0%	0	0.0%	60	100.0%
	46 to 55 Years old	31	100.0%	0	0.0%	31	100.0%
	age 56 and over	14	100.0%	0	0.0%	14	100.0%

Table 12: Engagement and age groups, case processing

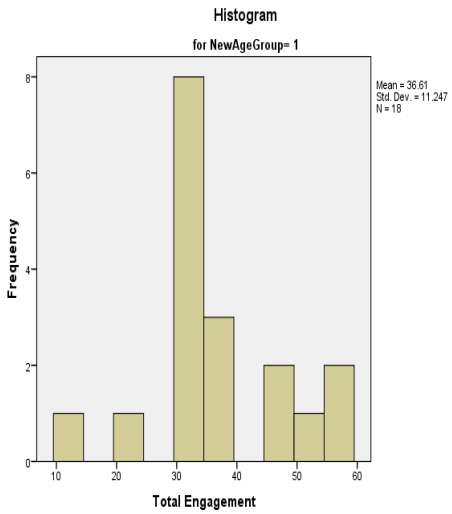

Figure 10: Engagement levels 18 to 35 years old

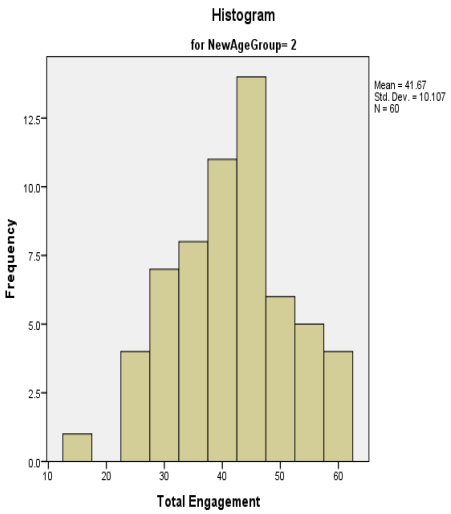

Figure 11: Engagement levels 36 to 45 years old

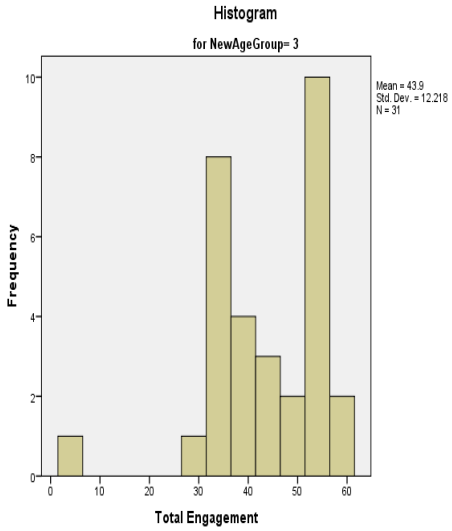

Figure 12: Engagement levels 46 to 55 years old

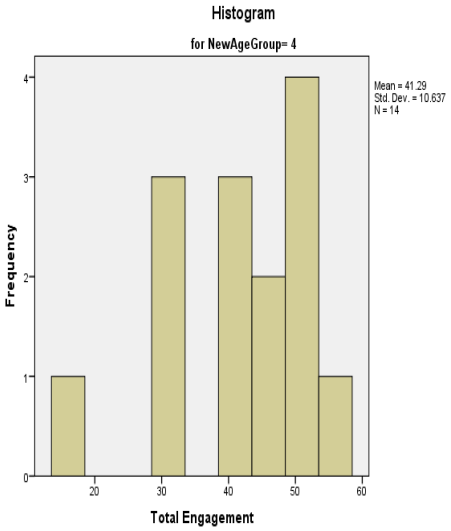

Figure 13: Engagement levels aged 56 and over

All associated descriptive statistics, for the age categories, are shown in appendix 3. At first glance the mean engagement level appears to rise moving up through the first three age groups from 36.61 to 43.9, and then fall back to 41.29. However the ranges are again very large with a high degree of overlap. To determine if the differences are statistically important we first check for normality.

The results of the Shapiro-Wilk's test of normality are presented in Table 13. The null hypothesis assumes normality of all the samples under consideration. Our results indicate normality for 3 categories **($W_{18\text{ to }35\text{ years old}} = .932$, df = 18, p = .214)**, **($W_{36\text{ to }45\text{ years old}} = .988$, df = 60, p = .807)**, and **($W_{\text{age 56 and over}} = .934$, df = 14, p = .343)** respectively, whilst the third age group exhibits significant deviation from normality **($W_{46\text{ to }55\text{ years old}} = .900$, df = 31, p = .007)**.

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	NewAgeGroup	Statistic	df	Sig.	Statistic	df	Sig.
Total Engagement	18 to 35 years old	.181	18	.121	.932	18	.214
	36 to 45 years old	.063	60	.200*	.988	60	.807
	46 to 55 Years old	.139	31	.134	.900	31	.007
	age 56 and over	.129	14	.200*	.934	14	.343

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 13: Age groups, test for normality

Due to identified deviation in normality for the third age category, the Kruskal-Wallis Test was relied upon. The null hypothesis is that there is no statistically significant difference between the median engagement levels of the age groupings.

The results of the Kruskal Wallis test are presented in Table 14 and 15 below and indicate no statistical difference **(χ^2 =6.108, p=0.106)** with a mean rank of **45.17** for 18 to 35 year olds, **62.18** for 36 to 45 year olds, **71.24** for 46 to 55 year olds and **62.43** for those aged 56 and over.

Ranks

	NewAgeGroup	N	Mean Rank
Total Engagement	18 to 35 years old	18	45.17
	36 to 45 years old	60	62.18
	46 to 55 Years old	31	71.24
	age 56 and over	14	62.43
	Total	123	

Table 14:Kruskal Wallis ranking age groups

Test Statistics[a,b]

	Total Engagement
Chi-Square	6.108
df	3
Asymp. Sig.	.106

a. Kruskal Wallis Test

b. Grouping Variable: NewAgeGroup

Table 15: Kruskal Wallis test age groups

4.3.4 Engagement levels and service

On analysis of the data generated for service it revealed that there was only a single respondent in the service category 1 to 5 years, this category was therefore combined with the next service category of 6 to 10 years to give an adequate sample size. Similarly there was a single respondent in the over 40 years' service category and this has been combined with the next highest category of 31 to 40 years, thus creating 4 service categories for analysis. The case summary of engagement levels for the 4 new categories is presented in Table 16. Histograms of the distributions of engagement levels of each age category are shown in Figures 14, 15, 16 and 17 respectively. The horizontal axis represents the engagement level of employees with the vertical axis depicting the number of employees with this engagement level. For example, Figure 11 indicates that of the 22 colleagues in the zero to 20 years' service category one had engagement levels of 10.

Case Processing Summary

		Cases					
		Valid		Missing		Total	
	New Service	N	Percent	N	Percent	N	Percent
Total Engagement	1 to 10 years	22	100.0%	0	0.0%	22	100.0%
	11 to 20 years	62	100.0%	0	0.0%	62	100.0%
	21 to 30 years	32	100.0%	0	0.0%	32	100.0%
	31 years and over	9	100.0%	0	0.0%	9	100.0%

Table 16: Engagement and service, case processing

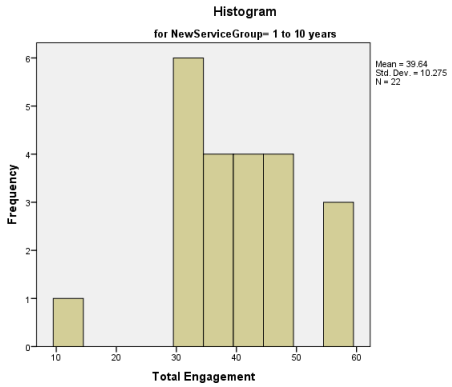

Figure 14: 1 to 10 years' service engagement distribution

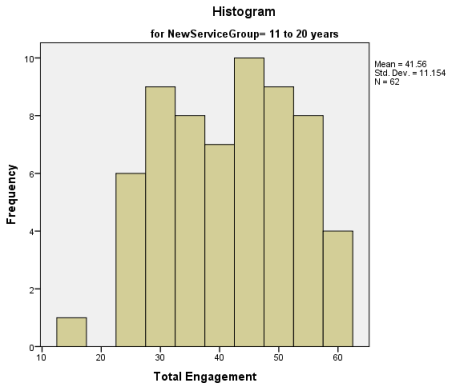

Figure 15: 11 to 20 years' service engagement distribution

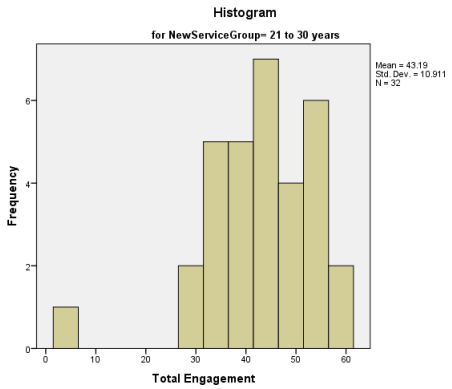

Figure 16: 21 to 30 years' service engagement distribution

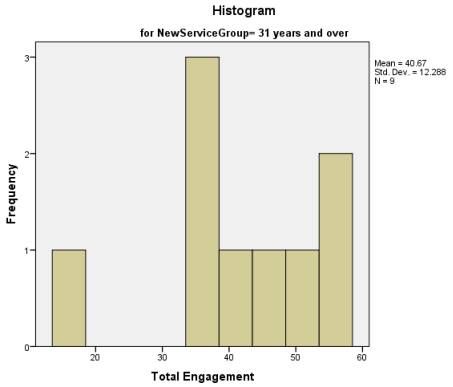

Figure 17: Over 31 years' service engagement distribution

Descriptive statistics are presented in appendix 4 and indicate no trend and little difference in the mean engagement level for each group, ranging from 39.64 to 41.56. Again the range of engagement and standard deviation in each group is significant indicating large overlap between the groups. The results of a Shapiro-Wilk's tests of normality are presented in Table 18. The null hypothesis assumes normality of the samples under consideration. Our results indicate normality for 3 categories **($W_{1 \text{ to } 10 \text{ years}} = .945$, $df = 22$, $p = .248$)**, **($W_{11 \text{ to } 20 \text{ years}} = .972$, $df = 62$, $p = .177$)**, and **($W_{31 \text{ years and over}} = .916$, $df = 9$, $p = .363$)** respectively whilst the third age group exhibits significant deviation from normality **($W_{21 \text{ to } 30 \text{ years}} = .906$, $df = 32$, $p = .009$)**.

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	New Service	Statistic	df	Sig.	Statistic	df	Sig.
Total Engagement	1 to 10 years	.129	22	.200*	.945	22	.248
	11 to 20 years	.101	62	.185	.972	62	.177
	21 to 30 years	.106	32	.200*	.906	32	.009
	31 years and over	.183	9	.200*	.916	9	.363

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 17: Service groups, test for normality

Due to deviations in normality, a Kruskal-Wallis Test was performed. The null hypothesis assumes no difference in mean ranks. The results are presented in Table 18 and 19 below and indicate no statistical difference **(χ^2 = 1.911, p=0.591)** with a mean rank of **55.93** one to ten years' service, **62.27** for eleven to twenty years' service, **69.53** for twenty-one years' service and **62.06** for those with over thirty-one years' service and over.

Ranks

	New Service	N	Mean Rank
Total Engagement	1 to 10 years	22	55.93
	11 to 20 years	62	62.27
	21 to 30 years	32	69.53
	31 years and over	9	62.06
	Total	125	

Table 18: Kruskal Wallis ranking service groups

Test Statistics[a,b]

	Total Engagement
Chi-Square	1.911
df	3
Asymp. Sig.	.591

a. Kruskal Wallis Test

b. Grouping Variable: New Service

Table 19: Kruskal Wallis test service groups

4.3.5 Engagement levels and functional area

On analysis of the data generated for functional area the number of respondents from logistics and the Engineering / safety is low at 4 and 9 respectively. These groups have been left separate and not combined to give a larger sample size as the purpose of the analysis is to examine if there are any differences between the functions. A case summary for the engagement levels of each functional group is presented in Table 20. Histograms of the distributions of engagement levels of each functional area are shown in Figures 18, 19, 20, 21, 22 and 23 respectively.

Case Processing Summary

		Cases					
		Valid		Missing		Total	
	Functional area	N	Percent	N	Percent	N	Percent
Total Engagement	Maintenance / Utilities	17	100.0%	0	0.0%	17	100.0%
	Production / IPTs	56	100.0%	0	0.0%	56	100.0%
	Logistics	4	100.0%	0	0.0%	4	100.0%
	Quality	28	100.0%	0	0.0%	28	100.0%
	Engineering / Safety	9	100.0%	0	0.0%	9	100.0%
	GTO / Finance	11	100.0%	0	0.0%	11	100.0%

Table 20: Engagement and functional area, case processing

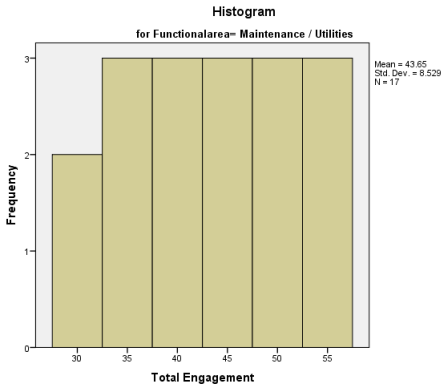

Figure 18: Engagement levels Maintenance /Utilities distribution

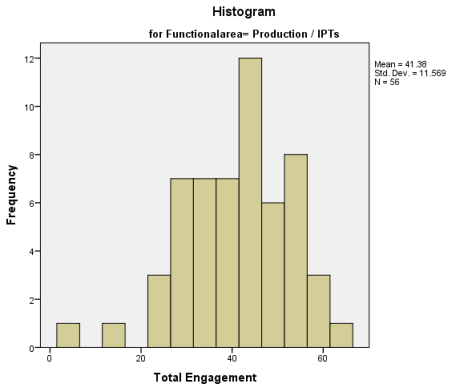

Figure 19: Engagement levels Production / IPTs distribution

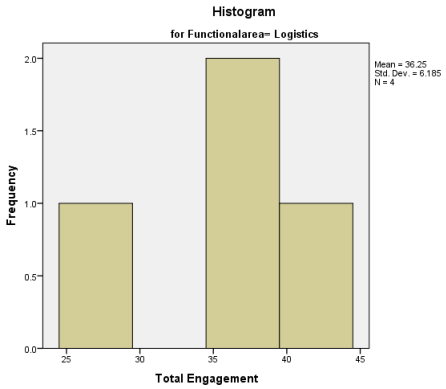

Figure 20: Engagement levels Logistics distribution

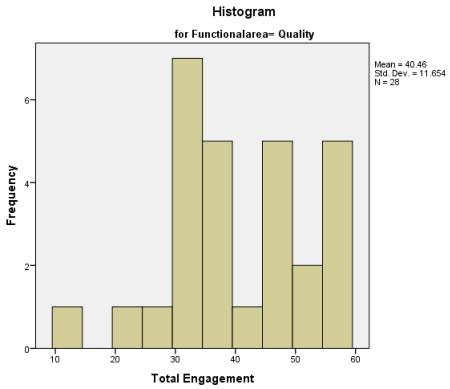

Figure 21: Engagement levels Quality distribution

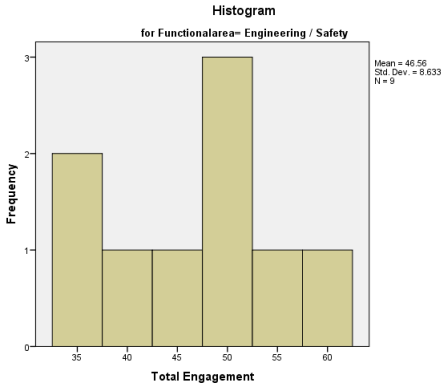

Figure 22: Engagement levels Engineering / Safety distribution

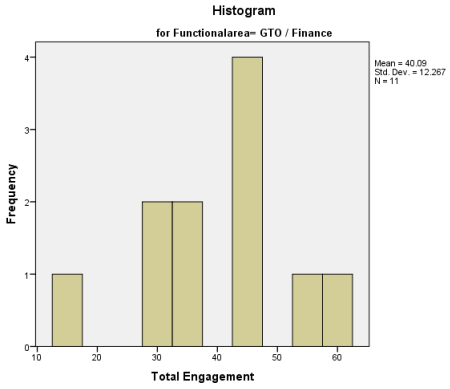

Figure 23: Engagement levels GTO / Finance distribution

Descriptive statistics for the new service groupings are presented in appendix 5 and indicates that the mean engagement scores across the functional groups are somewhat consistent with the Logistics group being lowest at mean of 36.25 and Engineering / Safety highest at 46.56 however these are the two groups with the lowest number of respondents limiting the reliability and investigative value of this descriptive analysis, there still exists a large range of engagement levels and large overlap between these two and the other four functional areas indicating that the engagement levels are consistent across the functional areas.

The results of tests of normality are presented in Table 21. As detailed previously we rely on the results of the Shapiro-Wilk's test of normality with the null hypothesis assuming normality of the sample under consideration. Our results indicate normality for Maintenance / Utilities **($W_{Maintenance} = .945, df = 17, p = .385$),** Production / IPTs **($W_{production/IPTs} = .967, df = 56, p = .133$)**, Quality **($W_{quality} = .956, df = 28, p = .284$)** Engineering **($W_{Engineering} = .937, df = 9, p = .553$)** and GTO / Finance **($W_{GTO/Finance} = .970, df = 11, p = .885$)** but that the logistics group exhibits significant deviation from normality **($W_{Logistics} = .696, df = 4, p = .010$)**.

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Functional area	Statistic	df	Sig.	Statistic	df	Sig.
Total Engagement	Maintenance / Utilities	.109	17	.200*	.945	17	.385
	Production / IPTs	.078	56	.200*	.967	56	.133
	Logistics	.422	4	.	.696	4	.010
	Quality	.092	28	.200*	.956	28	.284
	Engineering / Safety	.187	9	.200*	.937	9	.553
	GTO / Finance	.139	11	.200*	.970	11	.885

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 21: Functional area, test for normality;

Due to identified deviation from normality for the Logistics group, the Kruskal-Wallis Test was relied upon to investigate for significant differences. The null hypothesis is that there is no statistically significant difference between the median engagement levels of the six functional groups. The results are presented in Table 22 and 23 below and indicate no statistical difference **(χ^2= 4.198, p=0.521) with a mean rank of 69.03** for Maintenance/Utilities, **62.49** for Production / IPTs, **42.63** for Logistics, **59.43** for Quality, **80.17** for Engineering / Safety, and **58.73** for GTO / Finance.

Ranks

	Functional area	N	Mean Rank
Total Engagement	Maintenance / Utilities	17	69.03
	Production / IPTs	56	62.49
	Logistics	4	42.63
	Quality	28	59.43
	Engineering / Safety	9	80.17
	GTO / Finance	11	58.73
	Total	125	

Table 22: Kruskal Wallis ranking functional area

Test Statistics[a,b]

	Total Engagement
Chi-Square	4.198
df	5
Asymp. Sig.	.521

a. Kruskal Wallis Test

b. Grouping Variable: Functional area

Table 23: Kruskal Wallis test functional area

4.3.6 Engagement levels and educational level

Of the 125 respondents to the survey, 106 indicated the educational level they have attained. The case processing in Table 24 below describes the respondents. Whilst the number of respondents from the third level diploma and qualified craftsperson categories are low at 7 and 6 respectively they have been left separate as the purpose of the analysis is to determine if there are any differences between different educational levels and reducing the number of levels obstructs the purpose of the analysis.

Case Processing Summary

		Cases					
		Valid		Missing		Total	
	Education level	N	Percent	N	Percent	N	Percent
Total Engagement	Up to Leaving certificate	36	100.0%	0	0.0%	36	100.0%
	Third level diploma	7	100.0%	0	0.0%	7	100.0%
	Qualified Craftsperson	6	100.0%	0	0.0%	6	100.0%
	Third level degree	29	100.0%	0	0.0%	29	100.0%
	Third level masters	18	100.0%	0	0.0%	18	100.0%
	Third level doctorate / post doc	10	100.0%	0	0.0%	10	100.0%

Table 24: Engagement and education level, case processing

Histograms of the distributions of engagement levels of each educational level are shown in Figures 24, 25, 26, 27, 28, and 29 respectively. For example, Figure 24 indicates that of the 36 colleagues with Leaving certificates in the study 3 had one had engagement levels of 60. The Descriptive statistics for the data is presented in appendix 6 and displays high level of agreement in both the mean engagement score of each group and a high level of overlap between the groups due to the wide range of engagement values for each group.

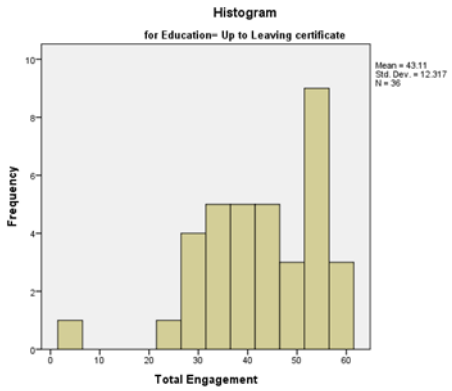

Figure 24: Engagement and leaving certificate

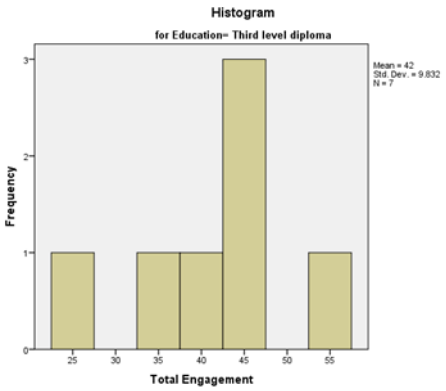

Figure 25: Engagement and third level diploma

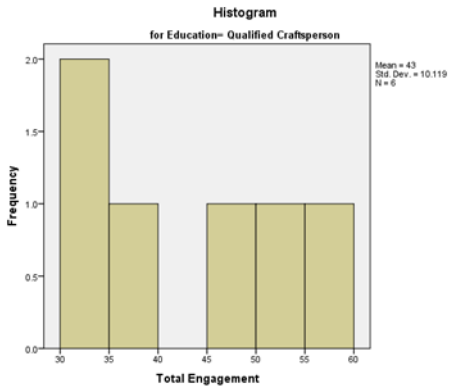

Figure 26: Engagement and qualified craftsperson

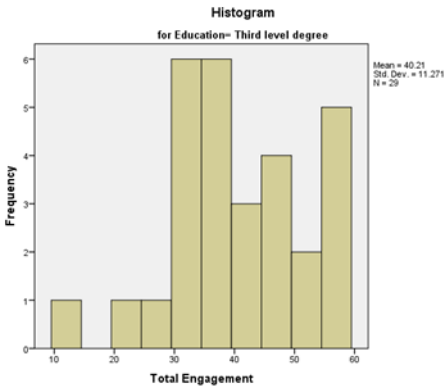

Figure 27: Engagement and third level degree

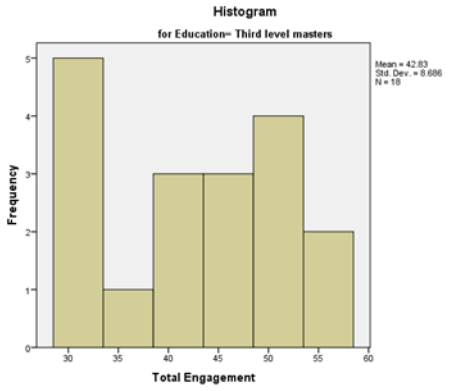

Figure 28: Engagement and third level masters

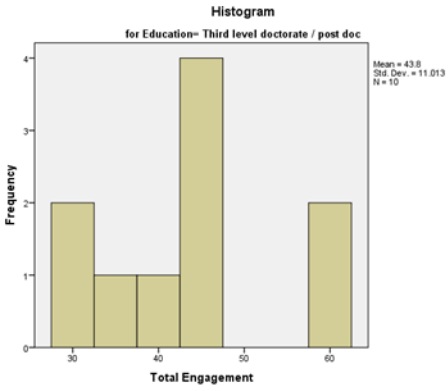

Figure 29: Engagement and doctorate / post doc

The results of tests of normality are presented in Table 25. A Shapiro-Wilk's test with a null hypothesis assuming normality indicates that for the group with up to leaving certificate achieved there is a significant deviation from normality **($W_{\text{leaving certificate}}$ = .934, df = 36, p = .033),** whilst all other levels exhibit normality, Third level diploma **(W_{diploma}= .955, df = 7, p = .774)**, Qualified craftsperson **(W_{crafts} = .860, df = 6, p = .190)**, Third level degree **(W_{degree} = .960, df = 29, p = .321)**, Third level masters **(W_{masters}= .929, df = 18, p = .189)** and third level doctorate / post doctorate **($W_{\text{doctorate}}$ = .915, df = 10, p = .319)** respectively.

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Education level	Statistic	df	Sig.	Statistic	df	Sig.
Total Engagement	Up to Leaving certificate	.128	36	.144	.934	36	.033
	Third level diploma	.199	7	.200*	.955	7	.774
	Qualified Craftsperson	.255	6	.200*	.860	6	.190
	Third level degree	.096	29	.200*	.960	29	.321
	Third level masters	.149	18	.200*	.929	18	.189
	Third level doctorate / post doc	.186	10	.200*	.915	10	.319

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 25: Education level, test for normality

Due to identified deviations in normality for the Leaving certificate group, the Kruskal-Wallis Test with a null hypothesis of no statistically significant difference between the median engagement levels of the groups. The results are presented in Table 26 and 27 below and indicate no statistical difference **(χ^2= 1.366, p=0.928)** with a mean rank of **56.67** for leaving certificate, **52.86** for Third level diploma, **55.08** for Qualified craftsperson, **48.09** for Third level degree, **54.44** for Third level masters, and **55.60** for Third level doctorate / post doctorate.

Ranks

	Education level	N	Mean Rank
Total Engagement	Up to Leaving certificate	36	56.67
	Third level diploma	7	52.86
	Qualified Craftsperson	6	55.08
	Third level degree	29	48.09
	Third level masters	18	54.44
	Third level doctorate / post doc	10	55.60
	Total	106	

Table 26: Kruskal Wallis ranking education level

Test Statistics[a,b]

	Total Engagement
Chi-Square	1.366
df	5
Asymp. Sig.	.928

a. Kruskal Wallis Test

b. Grouping Variable: Education level

Table 27: Kruskal Wallis test education level

4.3.7 Engagement and further education whilst working

Of the 125 respondents to the survey, 114 indicated if they had studied for and attained further qualification while working. The case processing study presented in Table 28 below describes that 63 respondents had in fact partaken in further development whilst working while 51 did not. The descriptive statistics in appendix7 indicate that the mean engagement score for both groups is quiet similar at 42.4 and 41.31 respectively.

Case Processing Summary

		Cases					
		Valid		Missing		Total	
	Further education	N	Percent	N	Percent	N	Percent
Total Engagement	Yes	63	100.0%	0	0.0%	63	100.0%
	No	51	100.0%	0	0.0%	51	100.0%

Table 28: Engagement and further education while working, case processing

Histograms of the distributions of engagement levels of the groups are shown in Figures 30 and 31 respectively. In both cases the horizontal axis represents the engagement level of employees with the vertical axis depicting the number of employees with this engagement level. For example, Figure 30 indicates that of the 63 who had undergone further education in the study 2 had engagement levels of 60 or greater.

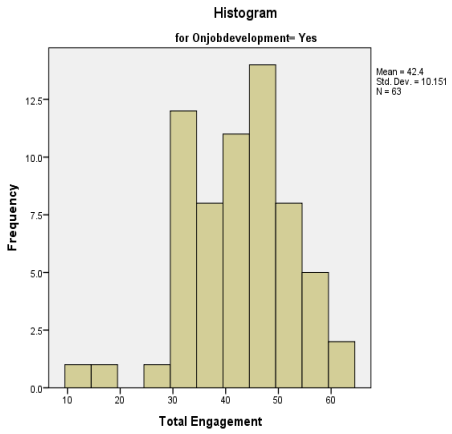

Figure 30: Engagement level and further education while working distribution

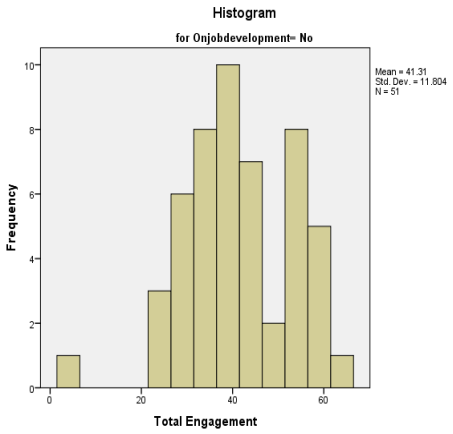

Figure 31: Engagement level and no further education while working distribution

The descriptive statistics are presented in appendix 7 show that whilst the means are similar both groups have a large spread of engagement scores and exhibit little difference.

The results of tests of a Shapiro-Wilk's normality test are presented in Table 29. The null hypothesis assumes normality of the samples under consideration. Our results indicate normality for the group that had further education **(W_{yes} = .970, df = 63, p = .123)**, but with a slight deviation from normality for the group with no further education **(W_{No} = .954, df = 51, p = .047)**.

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Further education	Statistic	df	Sig.	Statistic	df	Sig.
Total Engagement	Yes	.072	63	.200*	.970	63	.123
	No	.094	51	.200*	.954	51	.047

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 29: Further education while working, test for normality

Due to identified deviations in normality, the Mann-Whitney U test with null hypothesis of no difference between mean ranks. The results are shown in Tables 36 and 37 indicating no significant differences between those that had further education **(Mdn=59.01)**

compared to those that did not pursue further education **(Mdn=55.64)**, **(U = 1511.5, p = .588).**

Ranks

	Further education	N	Mean Rank	Sum of Ranks
Total Engagement	Yes	63	59.01	3717.50
	No	51	55.64	2837.50
	Total	114		

Table 30: Kruskal Wallis ranking, further education while working

Test Statistics[a]

	Total Engagement
Mann-Whitney U	1511.500
Wilcoxon W	2837.500
Z	-.542
Asymp. Sig. (2-tailed)	.588

a. Grouping Variable: Further education

Table 31: Mann-Whitney test, further education while working

4.4 Impact of the training allowance on engagement levels

The second objective of the study was to explore the perception of the employees as to whether the training allowance helped to maintain their engagement levels. Of the 125 respondents to the survey, 117 responded to indicate what impact if any that the training and development allowance had on their engagement levels. A Likert scale was used to respond to the question 'the training and development allowance has helped to maintain my engagement levels'. Table 32 lists the breakdown of the employee responses, and indicates that while almost 20% of the site did not feel that the allowance helped to maintain engagement, 65% of employees felt the allowance helped either somewhat, a lot or to a large extent. The responses are presented graphically in Figure 32 and at first glance the data appears normal but needs to be statistically investigated.

Development allowance

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all	22	17.3	18.8	18.8
	A little	19	15.0	16.2	35.0
	Somewhat	47	37.0	40.2	75.2
	a lot	21	16.5	17.9	93.2
	To a large extent	8	6.3	6.8	100.0
	Total	117	92.1	100.0	
Missing	System	10	7.9		
Total		127	100.0		

Table 32: Impact of training allowance on maintaining engagement

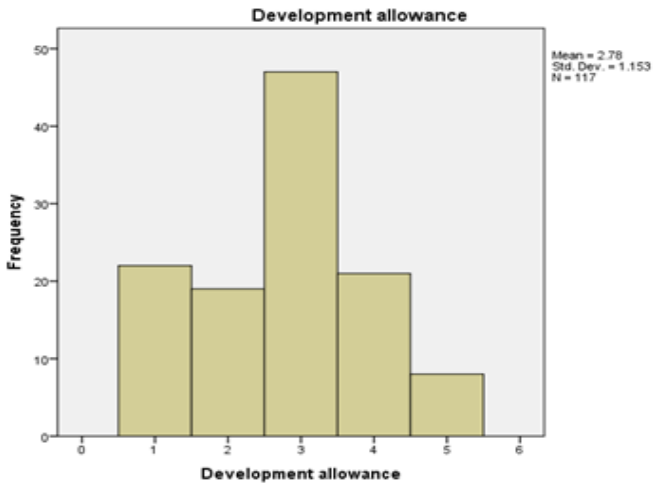

Figure 32: Engagement and impact of the training allowance

The case processing study for engagement and perception of the training allowance is presented below in table 33.

Case Processing Summary

		Cases					
		Valid		Missing		Total	
	Development allowance	N	Percent	N	Percent	N	Percent
Total Engagement	Not at all	22	100.0%	0	0.0%	22	100.0%
	A little	19	100.0%	0	0.0%	19	100.0%
	Somewhat	47	100.0%	0	0.0%	47	100.0%
	a lot	21	100.0%	0	0.0%	21	100.0%
	To a large extent	8	100.0%	0	0.0%	8	100.0%

Table 33: Engagement and impact of training allowance, case processing;

The descriptive statistics presented for the data in appendix 8 indicates that there is an increase in the mean engagement score as the groups indicate increasing impact of the training allowance. This highlights that, as employees perceive that the training and development allowance helps to maintain engagement levels, they also report higher engagement levels.

The results of tests of normality are presented in Table 34. As with previous analysis we rely on the results of the Shapiro-Wilk's test of normality for inferring the presence or absence of normality in all of the sample distributions. The null hypothesis associated with the Shapiro-Wilk's test of normality assumes normality of the sample under consideration. Our results indicate normality for the group indicating no impact on their engagement levels from the training allowance **($W_{none} = .922, df = 22, p = .085$)**, a lot of impact **($W_{a\ lot} = .938, df = 21, p = .203$)**, and a large extent **($W_{large\ extent} = .941, df = 8, p = .625$)**, but with a slight deviation from normality for the group indicating a little impact **($W_{a\ little} = .898, df = 22, p = .044$)**, and a significant deviation from normality for the group indicating that their engagement was somewhat impacted by the training allowance **($W_{somewhat} = .921, df = 47, p = .004$)**.

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Development allowance	Statistic	df	Sig.	Statistic	df	Sig.
Total Engagement	Not at all	.168	22	.106	.922	22	.085
	A little	.212	19	.025	.898	19	.044
	Somewhat	.111	47	.192	.921	47	.004
	a lot	.195	21	.036	.938	21	.203
	To a large extent	.159	8	.200*	.941	8	.625

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 34: Impact of training allowance, test for normality;

Due to identified deviations in normality for two of the five groups, the Kruskal-Wallis Test was relied upon. The null hypothesis is that there is no statistically significant difference between the median engagement levels of the five groups. The results are presented in Table 35 and 36 below and indicate a statistical difference **($\chi^2 = 17.287, p=0.002$)** with a mean rank of **43.64** for those indicting no impact from the allowance, **52.36** for those indicating a little impact, **57.30** for those indicating somewhat of an impact, **70.57** for the group indicating a lot of impact and **96.00** for the group indicating that the training allowance had impacted their engagement to a large extent.

The statistical test therefore validates our initial indication that there is a difference between the groups and that engagement levels raise as colleagues indicate that the training allowance helps to maintain their engagement levels.

Ranks

	Development allowance	N	Mean Rank
Total Engagement	Not at all	22	43.64
	A little	19	52.63
	Somewhat	47	57.30
	a lot	21	70.57
	To a large extent	8	96.00
	Total	117	

Table 35: Kruskal Wallis ranking, impact of training allowance

Test Statistics[a,b]

	Total Engagement
Chi-Square	17.287
df	4
Asymp. Sig.	.002

a. Kruskal Wallis Test

b. Grouping Variable: Development allowance

Table 36: Kruskal Wallis test impact of training allowance

In order to further explore the impact of the training allowance on colleague's engagement levels a Chi-Square test is performed to look at the relationship between the perceived impact of the training allowance on engagement and some demographic factors. The first demographic factor to be explored is educational level. This factor is chosen to determine if employees previously motivated to higher educational levels perceive a greater impact to their engagement levels from the provision of a training allowance. The second demographic factor to be explored is age to determine if the older cohort on site feels less impact by the provision of the allowance due to limited interest in pursuing formal training as they approach the end of their careers. The last demographic factor to be examined is functional area to explore if those employed in the more technical functions perceive greater impact from the training allowance as their functions are typically more reliant on continuous upskilling than the blue collar cohort.

4.4.1 Impact of the training allowance and education level

Table 37 below contains the case processing results while Table 38 displays the output from the chi-Square test. We rely on the Chi-Square test to determine if there is a relationship between the variables, namely perceived impact of the training allowance and educational level, both of which are ordinal variables.

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Development allowance * Education level	106	83.5%	21	16.5%	127	100.0%

Table 37: Impact of training allowance and education level, case processing

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	26.772[a]	20	.142
Likelihood Ratio	31.394	20	.050
Linear-by-Linear Association	2.804	1	.094
N of Valid Cases	106		

a. 21 cells (70.0%) have expected count less than 5. The minimum expected count is .40.

Table 38:Chi-Square test, impact of training allowance and education level

The relation between the these two variables was not significant, **χ^2 (2, N= 106) = 26.772, p = 0.142**

4.4.2 Impact of the training allowance and age

In order to further explore the impact of the training allowance on colleague's engagement levels a Chi-Square test is performed to determine if there is a relationship between the variables, namely perceived impact of the training allowance and age, both of which are ordinal variables. Table 39 below contains the case processing results while Table 40 displays the output from the chi-Square test

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Development allowance * NewAgeGroup	115	90.6%	12	9.4%	127	100.0%

Table 39: Impact of training allowance and age, case processing

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	18.462[a]	12	.102
Likelihood Ratio	17.036	12	.148
Linear-by-Linear Association	.071	1	.789
N of Valid Cases	115		

a. 11 cells (55.0%) have expected count less than 5. The minimum expected count is .97.

Table 40: Chi-Square test, impact of training allowance and age

The relation between the these two variables was not significant , χ^2 **(2, N= 115) = 18.462, p = 0.102**

4.4.3 Perception of the training allowance impact and functional area

In order to further explore the impact of the training allowance on colleague's engagement levels a Chi-Square test is performed to determine if there is a relationship between the variables, namely perceived impact of the training allowance and functional area, one of which is an ordinal variable whilst functional area is a nominal variable.

Table 41 below contains the case processing results while Table 42 displays the output from the chi-Square test

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Development allowance * Functional area	117	92.1%	10	7.9%	127	100.0%

Table 41: Impact of training allowance and functional area, case processing,

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	21.754[a]	20	.354
Likelihood Ratio	21.919	20	.345
Linear-by-Linear Association	.267	1	.605
N of Valid Cases	117		

a. 24 cells (80.0%) have expected count less than 5. The minimum expected count is .27.

Table 42: Chi-Square test, impact of training allowance and functional area

The relation between the these two variables was not significant, χ^2 **(2, N= 117) = 21.754, p = 0.354**

4.5 Employees ranking of the importance of remaining engaged

Table 43 displays the results of the study in relation to people's perception of why it is important to maintain engagement. Respondents were asked to rank the following reasons in order of importance from 1 to 10 with one being most important.

Reason 1: I'm a professional and don't want my standards to slip

Reason 2: If I lose engagement it will be obvious to a potential employer and might hinder further employment opportunities

Reason 3: If we continue to do a good job the company may decide not to close

Reason 4: By maintaining standards, it may increase the likelihood of the site being sold

Reason 5: I want to get a good reference

Reason 6: I am being paid so should continue to perform to my best

Reason 7: I don't want to let my Team / Shift/ Colleagues down by not pulling my weight

Reason 8: To avoid safety issues

Reason 9: To avoid trouble with my manager / supervisor

Reason 10: To maximize performance bonus

There were 93 complete responses from the 125 respondents which are then used to generate the data set for analysis. The reason code with the lowest total is the code chosen as the most important, as it received the lowest number (or highest rank) from each respondent; the rankings are presented in Table 50 below.

Reason code	Total	Ranking for importance
I'm a professional and don't want my standards to slip	237	1
I am being paid so should continue to perform to my best	367	2
I don't want to let my Team / Shift/ Colleagues down by not pulling my weight	392	3
To avoid safety issues	399	4
I want to get a good reference	489	5
If I lose engagement it will be obvious to a potential employer and might hinder further employment opportunities	534	6
To maximize performance bonus	538	7
To avoid trouble with my manager / supervisor	605	8
By maintaining standards, it may increase the likelihood of the site being sold	651	9
If we continue to do a good job the company may decide not to close	786	10

Table 43: Overall ranking of reasons for maintaining engagement

When tabulated and the totals calculated 3 clear categories in the rankings are obvious and have been highlighted in table 50 above. The results demonstrate that employees believe that maintaining professional standards, performing the work they are paid for, not letting their team down, and avoiding safety issues rank as the first four reasons for maintaining engagement levels. The second category relates to getting a good reference, improving employment prospects and maximizing performance bonus and the last category contains reasons in relation to avoiding site closure, improving the possibility of site sale and avoiding management censure.

In order to determine if these rankings are dependent on any demographic differences the total for each reason code were recalculated for the main demographics of gender, union status and functional area.

4.5.1 Ranking of the importance of remaining engaged by gender.

The results for the two genders are tabulated below in Table 44. It can be seen that while the sequence might change slightly there is generally very good agreement between the genders, and that each gender is consistent with the overall ranking.

Reason code	Overall Ranking	Male Ranking	Female Ranking
I'm a professional and don't want my standards to slip	1	1	1
I am being paid so should continue to perform to my best	2	2	2
I don't want to let my Team / Shift/ Colleagues down by not pulling my weight	3	4	3
To avoid safety issues	4	3	4
I want to get a good reference	5	5	5
If I lose engagement it will be obvious to a potential employer and might hinder further employment opportunities	6	7	6
To maximize performance bonus	7	6	8
To avoid trouble with my manager / supervisor	8	8	7
By maintaining standards, it may increase the likelihood of the site being sold	9	9	10
If we continue to do a good job the company may decide not to close	10	10	9

Table 44: Ranking reasons for maintaining engagement with gender

4.5.2 Ranking of the importance of remaining engaged by union status.

The results for the unionised and non -unionised are tabulated below in Table 45. It can be seen that while the sequence at the top is different with the unionised group listing 'safety' and 'not wanting to let the team down' as the most important reasons followed by 'I'm a professional' slipping to third, there is generally very good agreement between the groups after this rearrangement, and the sequence closely reflects the overall site sequence.

Reason code	Overall Ranking	Non Union	Union
I'm a professional and don't want my standards to slip	1	1	3
I am being paid so should continue to perform to my best	2	2	5
I don't want to let my Team / Shift/ Colleagues down by not pulling my weight	3	3	2
To avoid safety issues	4	4	1
I want to get a good reference	5	5	4
If I lose engagement it will be obvious to a potential employer and might hinder further employment opportunities	6	7	6
To maximize performance bonus	7	6	7
To avoid trouble with my manager / supervisor	8	8	8
By maintaining standards, it may increase the likelihood of the site being sold	9	9	9
If we continue to do a good job the company may decide not to close	10	10	10

Table 45: Ranking reasons for maintaining engagement by union status

4.5.3 Ranking of the importance of remaining engaged by functional area.

The results for all functional areas are tabulated below in Table 46. And it can be seen that there is a high level of similarity in across all groups ranking sequence.

Reason code	Overall Rank	Maintenance	IPT/ Production	Logistic	Quality	Eng/ Safety	GTO/ Fin
I'm a professional and don't want my standards to slip	1	2	1	2	1	2	1
I am being paid so should continue to perform to my best	2	4	3	5	3	1	2
I don't want to let my Team / Shift/ Colleagues down by not pulling my weight	3	5	4	3	2	4	3
To avoid safety issues	4	3	2	8	7	3	4
I want to get a good reference	5	6	5	6	6	7	5
If I lose engagement it will be obvious to a potential employer and might hinder further employment opportunities	6	9	7	1	4	10	6
To maximize performance bonus	7	7	6	6	5	6	8
To avoid trouble with my manager / supervisor	8	1	8	8	8	8	7
By maintaining standards, it may increase the likelihood of the site being sold	9	8	9	9	9	5	9
If we continue to do a good job the company may decide not to close	10	10	10	10	10	9	10

Table 46: Ranking of reasons for maintaining engagement and functional area

The main outliers to the general sequence are in the maintenance and logistics groups with maintenance indicating avoiding management trouble as the top reason to remain engaged, and Logistics indicating that a lack of engagement potentially hampering future employment as top rank. In general however the ranking remains consistent with the emphasis on those of professionalism, team-work and safety followed by reference, employability and bonus and least important being management censure, site sale and avoiding closure.

Section 5: Discussion

5.1 Introduction

In this section we will discuss the results obtained from the study and draw some inferences from the data. Firstly we will discuss the engagement measure, the overall response rate and engagement levels on site. Secondly we will revisit the hypothesis proposed earlier to determine if they can be deemed valid and explore the rationale behind the data.

5.2 The engagement measure

The data generated in the study gave a high Cronbach's alpha score 0f 0.922 indicating that the measure is valid. The decision to sum the individual scales to generate an overall engagement score is supported by the statistical analysis and also in literature suggesting that it is not only a valid method of handling of the data but is actually the preferred mechanism (De Bruin and Henn, 2013). This allows us to generate an engagement score for each individual responding to the survey. The response by 125 individuals is a response rate of 62% of the total employees on site at the time of the study. This represents a significant proportion of the colleagues on site which allows general inference on site engagement; however the lower number of respondents from individual departments limits the breath of the conclusions at a departmental level.

5.3 Engagement levels and demographics

A number of hypotheses were proposed for the study. This section will examine each one in turn to determine if it can be deemed valid or not in light of the data generated by the study.

5.3.1 Hypothesis 1

Proposed Hypothesis: *Employees on site generally report poor engagement levels.*

As can be seen in the results section the engagement levels on site vary across a large range. The bottom of each UWES scale is 1 and the top 7 giving a minimum engagement score of 7for each subscale and a maximum of 63 for the entire scale. The mean on site is 41.58. This is well above the midpoint of the scale at 31.5. In fact over 75% of respondents report engagement scores greater than 31.5 allowing the inference that engagement levels on site are good and on the high end of the scale, thereby invalidating hypothesis 1. This supports the earlier research that where the closedown effect is evident there will be good employee engagement levels (Bergman and Wigblad, 1999).

5.3.2 Hypothesis 2

Proposed Hypothesis: *There is no statistically relevant relationship between the engagement level and demographic, functional groupings, or length of service of the employee.*

When the engagement scores are broken down by gender we see no significant differences between the engagement scores. This is perhaps to be expected in that there is no discrimination in pay, severance or entitlements between the genders, and supports earlier studies indicating that burnout, which exists on the same scale as engagement, is not mediated by gender (Schaufeli and Enzmann, 1998).

In relation to union status earlier studies indicate lower engagement levels of blue collar workers (Bakker, Salanova and Schaufeli, 2006). The unionised cohort typically

represents those with lower educational levels, 22 of the 35 unionized respondents were educated to leaving certificate, and only 9 qualified to third level diploma or beyond, which could potentially lower their re-employment opportunities and thereby impact engagement. Literature also suggests that groups with self-regulated outputs where going beyond peer performance would lead to social punishment, as typified by union groups, does not yield engaged behaviors (Macey and Schneider, 2008). The data from the study however indicates that whilst the mean for the unionised cohort at 39.23 is lower than the non-unionised at 42.73 the two groups are not statistically different. This could indicate either that the unionised cohort do not believe that their employment opportunities are any lower than their non unionised colleagues, or that future employment opportunities doesn't influence engagement levels, the quantitative cross-sectional nature of this study precludes any causal determinations or exploration of the reasons for the engagement levels but the data does allow us to conclusively eliminate any preconceived notion that may exist that unionised personnel on site are any less engaged than their non-unionised colleagues.

Earlier research on engagement, using the same measurement tool as this study, indicates that contrary to initial expectations employee engagement tends to increase with age (Bakker, et al., 2006). The data from this study indicated that mean engagement scores do increase slightly from 36.61 for the 18 to 35 year olds to 41.67 for the 36 to 45 year olds and 43.90 for the 46 to 55 year olds but the mean engagement score drops back to 41.29 for the 55 to 65 year olds. This indicates that, for this study at least, the age and engagement relationship does not hold entirely true, and statistically the engagement levels across the different age groups is not different. The data does however allow us to state that engagement levels of the older cohort are not lower and are potentially higher than their younger colleagues. The slight drop in engagement levels amongst the oldest age group could potentially reflect that some of the sites older colleagues may not seek full time re-employment after the close down and as such the closedown represents retirement and the end of a career rather than redundancy, again however the data from the study being quantitative rather than qualitative does not allow further examination of this supposition. The high engagement scores for the older colleagues does reflect previous studies indicating that older colleagues have potentially greater resilience than

their younger counterparts, built up from greater life experience, and are less susceptible to the 'discouraged worker' or 'poisoning effect' of redundancy (Mazerolle and Singh, 1999).

Similar to the data on age, the study indicates that service does not impact on engagement levels. Whilst service and age are typically related, service to the company has an added dimension in that the relationship with the company is extended and the psychological contract has been built over a longer number of years. It may therefore be reasonable to suggest that those with longer service may feel a greater violation of their psychological contract and suffer from a greater loss of trust. Previous research has demonstrated that trust in the organization is a requirement for engagement (Macey and Schneider, 2008) therefore it could be argued that those with longer service should report lower engagement levels. The data from the study however indicates that there is no statistically relevant difference in engagement across service groups. This could infer that either the closedown has not negatively impacted employees' trust in the organization or that the nature of the psychological contract has shifted from the traditional job security model, to the transactional employability model as purported in literature (Hendry and Jenkins, 1997) and thereby not violated by the closedown. An alternative inference as suggested in literature, is that the content of the psychological contract is revised over time (Schalk and Roe, 2007) and after the initial violation of the contract with the closure announcement, employees over the extended closure period have redrafted and altered the nature of the psychological contract replacing the expectation of job security with the expectation of the delivery of the agreed severance terms and related bonus's. This theory is reflected in that a number of colleagues, when their exit dates were extended, and a positive reaction was predicted as they remained in employment for longer, have actually reacted negatively to the extension. Any inference in relation to the psychological contract however is hampered not only by the cross-sectional nature of the study not providing any causal relationships and the quantitative nature not providing psychological depth to the investigation but also the very nature of the psychological contract and the lack of clarity of the construct (Guest, 1998).

In a similar manner to age and service, the level of education of employees could be expected to impact on engagement, primarily in that roles held by more qualified personnel would be of a more technical or managerial nature. Roles of this type have a greater career aspect and thus could be more protected from the violation of the psychological contract, and render the incumbents more employable after the closure. However the data from the study demonstrates no statistical differences across the educational groups and very similar mean engagement scores and ranges. Similarly the data from the different functional groups yields no differences between the technical, financial, engineering, quality or production groups which indicate that the qualification of the employee or the nature of the role doesn't impact in a predictable manner on engagement levels.

The data for those that had studied for and achieved further qualifications whilst working against those that had not pursued any further qualifications whilst working again fails to identify any statistically significant difference in engagement levels between the two groups. This indicates that whilst one group are more intrinsically motivated to achieving further qualification or see it as necessary for career growth, it does not impact overall engagement levels. Whilst it may be tempting to infer from this that career or personal growth is not related significantly with employee engagement, the cross- sectional nature of the study does not allow examination of any causal inferences, it can only state that there does not appear to be a relationship between engagement levels and the motivation to achieve further qualification while working.

Therefore hypothesis 2 has been validated, in that no statistically relevant relationship between engagement levels and demographic, functional groupings, or length of service of the employee has been identified by the study

5.3.3 Hypothesis 3

Proposed Hypothesis: *Employees feel that the training and development allowance is not a significant contributor to maintaining their engagement levels.*

Whilst a significant portion of respondents felt that the training allowance did not help maintain their engagement levels, the majority of respondents felt that the training allowance helped to some degree. Therefore hypothesis 3 is invalid

5.3.4 Hypothesis 4

Proposed Hypothesis: *There is no statistically significant relationship between engagement levels and the perceived impact of the training and development allowance.*

The data from the study indicates that those respondents that felt that the training allowance impacted on their engagement levels actually report increased engagement levels. There appears to be a direct relationship between the perceived impact of the training allowance and reported engagement levels. This relationship is further evident in the correlation data presented in Table 36 indicating a strong relationship between the perception of the allowance and engagement that is significant and not due to chance. It may be that engagement is a self-fulfilling prophesy in that those who are already engaged become more engaged with interventions such as the training allowance, whilst those who are not engaged derive no benefit from the intervention. Another possible inference is that those reporting higher engagement have more emotional and mental capacity to react to the closedown and are able to respond to the offered intervention more effectively. The data from the study indicates the presence of a relationship, but is not able to determine any causality due to its cross-sectional nature. However hypothesis 4 is invalidated in that a relationship does exist.

5.3.5 Hypothesis 5

Proposed Hypothesis: *There is no statistically relevant relationship between educational level, functional area and age to the perceived contribution that the training and development allowance has on engagement levels.*

Whilst the data from the study indicates a relationship between engagement levels and the employee's perception of the impact of the training allowance, Hypothesis 5 has been validated by the results of the study in that the data demonstrates that there is no relationship between the perceived impact of the allowance on engagement with employee age, educational level or functional area. This indicates that the impact of the allowance is highly personal and it would be difficult to customize the allowance based on demographic or functional differences, supporting the provision of a generic training allowance.

5.3.6 Hypothesis 6

Proposed Hypothesis: *There is no significant difference in the ranking of the reasons for maintaining engagement based on gender, union status or functional area.*

The data from the study indicates a strong trend in the ranking of the 10 listed reasons for maintaining engagement. The only divergence from this trend was in the operations and maintenance groups where safety was chosen as the primary reason for maintaining engagement. This is perhaps to be expected on chemical manufacturing site where operations and maintenance groups have a significant daily safety focus. In general the results reflect a strong focus on people's professionalism, a desire to pull their weight, not let the team down, and to be recognized in a good reference over monetary rewards, avoidance of trouble with supervision and any misconceived ideas of site sale or avoidance of closure. Hypotheses 6 has been validated there is no significant difference in the rankings based on gender, union status or functional area.

Section 6: Conclusions and limitations

The study demonstrates that the site has maintained productivity during the closedown phase and that engagement levels on site are good and on high end of the scale. The engagement levels do not exhibit any relationship to gender, age, service, union status, functional areas or educational level.

The study demonstrates that there isn't a relationship between engagement levels and intrinsic motivation to achieve further qualifications, but that there is a relationship between engagement levels and the perceived the impact of the training allowance, with the majority of colleagues indicating that the allowance helped maintain their engagement to some extent. The impact of the allowance is personal however and cannot be predicted by functional, age or educational differences.

Previous studies on the closedown effect indicate that performance improvements in the closedown may reflect a desire on the part of employees to prove the company decision wrong and perhaps to reverse the closure decision (Hansson and Wigblad, 2006). The data from this study indicates that these were the least important of the reasons offered for maintaining engagement. The most popular reason for maintaining engagement was peoples own sense of professionalism and maintaining standards rather than the chance of site sale and avoiding closure.

A limitation of the study is the lack of agreement on the definition of engagement. All conclusions drawn can only be referenced against the definition of engagement as measured by the UWES-9. Whilst the data is conclusive with respect to engagement levels no inference can be made against job satisfaction, morale or motivation. The quantitative nature of the study does not allow for exploration of the personal motivations behind the responses provided to the study, it only allows comparisons at high level demographic or functional groupings.

By studying employee's perception of the training and development allowance we can see that the provision of the allowance does help to maintain engagement levels, but that the effect is not consistent across the site. So whilst the provision of the allowance has a

legitimate bargaining function during the severance negotiations it also has the potential to act an engagement intervention. However a one size fits all approach to training as an engagement intervention will not generate a consistent impact.

The demographic and functional area differences in engagement levels suggest that targeted engagement interventions for specific demographic or functional groupings are not required. A qualitative study would provide more specific personal data in relation to engagement interventions.

The study was performed within a Pharmaceutical manufacturing plant undergoing closure in Ireland and cannot be generalized beyond that.

Section 7: Recommendations

The following are the recommendations that emanate from this study;

1) The data from the study is specific to work engagement and not motivation, clarification of the language and definitions of those terms is required so that academics and businesses can be specific as to the interventions they wish to employ.
2) The academic community need to move beyond the debate on the construct of engagement into investigating the antecedents, drivers and results of engagement to fill the void currently being exploited by the business consultancy industry.

3) Companies should perform their own engagement checks using available tools such as UWES-9 to benchmark engagement levels periodically at no cost other than hours to collate the data and compile survey estimated at less than €1,000

4) Companies should conduct qualitative interviews with employee samples periodically to explore and identify engagement initiatives, 40 man-hours per year would suffice for quarterly interviews with associated costs of less than €,3000 for medium to larger companies

5) Further research by company bodies such as IBEC, on changes to the psychological contract during a closedown process would be beneficial to determine what the employee will consider as a violation post closure announcement, particularly in cases of a long lead time to closure and where exit timeframes could be subject to change. An understanding of the psychological contract and what would constitute a violation during this timeframe could assist in minimising unnecessary stress to the impacted employees. Estimate 3 months to complete study and cost in region of € 15,000.

6) The relationship between the impact of the training allowance and engagement levels during closedown should be examined qualitatively as the quantitative nature of this study does not provide the necessary depth of analysis cost less than €2000 assuming one person allowed two weeks to complete study.

7) Business groups, academics and unions need to consult more and design mechanisms for sharing knowledge and experience in relation to training allowances during site closures. The numbers of employees who benefit from the training resources made available to them by both the company and the state are poor. To maximise the opportunities for those re-entering the employment market government policy in relation to the provision of training opportunities for those being made redundant needs to be driven by data with industrial and academic evidence.

Personal Learning Reflection

Being out of the educational system for a number of years I found the completion of the Masters and in particular this study to be very challenging but very rewarding. Completing the study exposed me to a world of information and data that I was unaware of to date. The detail and exactness required for completion of the study was a revelation but has provided the opportunity to develop patience and attention to detail, both skills long dormant if indeed they existed at all prior to this undertaking.

The study has provided me with a sense of fulfillment, being able to take on a new, and for me, unexplored topic and lead and drive a study to completion has provided a personal goal at a turbulent time in my life i.e. being made redundant, and also a sense of achievement. Planning and organizing the study, reviewing the available literature, the numerous engagement instruments and generating the survey are all practical skills that will be useful in my future career.

Understanding the research question has been a very important learning. My tendency from a manufacturing background was to dive straight into problem solving without taking the required time to form the question. The requirement from the study to understand the question first before looking for the answer is an invaluable learning, time spent defining the problem originally would have saved a great deal of frustration during the study.

Performing the study has highlighted the importance of generating data to understand the problem rather than relying on experience or intuition. The study results overturned some misconceptions and I had previously held prior to the study. Completing the study has highlighted the importance of generating data and facts to drive conclusions which again will prove valuable in my future.

Alex Sheehan

Appendix 1: Descriptive statistics engagement and gender

Descriptives

	Sex			Statistic	Std. Error
Total Engagement	Male	Mean		41.41	1.118
		95% Confidence Interval for Mean	Lower Bound	39.19	
			Upper Bound	43.63	
		5% Trimmed Mean		41.81	
		Median		42.00	
		Variance		109.923	
		Std. Deviation		10.484	
		Minimum		4	
		Maximum		61	
		Range		57	
		Interquartile Range		15	
		Skewness		-.639	.257
		Kurtosis		1.041	.508
	Female	Mean		41.34	2.014
		95% Confidence Interval for Mean	Lower Bound	37.24	
			Upper Bound	45.45	
		5% Trimmed Mean		41.53	
		Median		39.00	
		Variance		129.781	
		Std. Deviation		11.392	
		Minimum		15	
		Maximum		62	
		Range		47	
		Interquartile Range		20	
		Skewness		.025	.414
		Kurtosis		-.534	.809

Appendix 2: Descriptive statistics engagement and union status

Descriptives

	Union status			Statistic	Std. Error
Total Engagement	Unionised	Mean		39.23	1.955
		95% Confidence Interval for Mean	Lower Bound	35.26	
			Upper Bound	43.20	
		5% Trimmed Mean		39.71	
		Median		40.00	
		Variance		133.770	
		Std. Deviation		11.566	
		Minimum		4	
		Maximum		59	
		Range		55	
		Interquartile Range		14	
		Skewness		-.606	.398
		Kurtosis		1.075	.778
	Non unionised	Mean		42.73	1.129
		95% Confidence Interval for Mean	Lower Bound	40.49	
			Upper Bound	44.98	
		5% Trimmed Mean		43.02	
		Median		43.50	
		Variance		109.563	
		Std. Deviation		10.467	
		Minimum		12	
		Maximum		62	
		Range		50	
		Interquartile Range		16	
		Skewness		-.318	.260
		Kurtosis		-.108	.514

Appendix 3: Descriptive statistics engagement and age

Descriptives

	NewAgeGroup			Statistic	Std. Error
Total Engagement	18 to 35 years old	Mean		36.61	2.651
		95% Confidence Interval for Mean	Lower Bound	31.02	
			Upper Bound	42.20	
		5% Trimmed Mean		36.85	
		Median		33.00	
		Variance		126.487	
		Std. Deviation		11.247	
		Minimum		12	
		Maximum		57	
		Range		45	
		Interquartile Range		14	
		Skewness		.119	.536
		Kurtosis		.422	1.038
	36 to 45 years old	Mean		41.67	1.305
		95% Confidence Interval for Mean	Lower Bound	39.06	
			Upper Bound	44.28	
		5% Trimmed Mean		41.78	
		Median		42.00	
		Variance		102.158	
		Std. Deviation		10.107	
		Minimum		15	
		Maximum		62	
		Range		47	
		Interquartile Range		13	
		Skewness		-.176	.309
		Kurtosis		-.121	.608
	46 to 55 Years old	Mean		43.90	2.194
		95% Confidence Interval for Mean	Lower Bound	39.42	
			Upper Bound	48.38	
		5% Trimmed Mean		44.76	
		Median		45.00	
		Variance		149.290	
		Std. Deviation		12.218	
		Minimum		4	
		Maximum		61	
		Range		57	
		Interquartile Range		19	
		Skewness		-1.084	.421
		Kurtosis		2.119	.821
	age 56 and over	Mean		41.29	2.843
		95% Confidence Interval for Mean	Lower Bound	35.14	
			Upper Bound	47.43	
		5% Trimmed Mean		41.93	
		Median		43.00	
		Variance		113.143	
		Std. Deviation		10.637	
		Minimum		16	
		Maximum		55	
		Range		39	
		Interquartile Range		17	
		Skewness		-.936	.597
		Kurtosis		.964	1.154

Appendix 4: Descriptive statistics engagement and service

Descriptives

	New Service			Statistic	Std. Error
Total Engagement	1 to 10 years	Mean		39.64	2.191
		95% Confidence Interval for Mean	Lower Bound	35.08	
			Upper Bound	44.19	
		5% Trimmed Mean		40.12	
		Median		40.50	
		Variance		105.576	
		Std. Deviation		10.275	
		Minimum		12	
		Maximum		57	
		Range		45	
		Interquartile Range		14	
		Skewness		-.512	.491
		Kurtosis		1.310	.953
	11 to 20 years	Mean		41.56	1.417
		95% Confidence Interval for Mean	Lower Bound	38.73	
			Upper Bound	44.40	
		5% Trimmed Mean		41.66	
		Median		42.50	
		Variance		124.414	
		Std. Deviation		11.154	
		Minimum		15	
		Maximum		62	
		Range		47	
		Interquartile Range		19	
		Skewness		-.120	.304
		Kurtosis		-.853	.599
	21 to 30 years	Mean		43.19	1.929
		95% Confidence Interval for Mean	Lower Bound	39.25	
			Upper Bound	47.12	
		5% Trimmed Mean		43.85	
		Median		43.00	
		Variance		119.060	
		Std. Deviation		10.911	
		Minimum		4	
		Maximum		61	
		Range		57	
		Interquartile Range		16	
		Skewness		-1.290	.414
		Kurtosis		4.114	.809
	31 years and over	Mean		40.67	4.096
		95% Confidence Interval for Mean	Lower Bound	31.22	
			Upper Bound	50.11	
		5% Trimmed Mean		41.24	
		Median		39.00	
		Variance		151.000	
		Std. Deviation		12.288	
		Minimum		16	
		Maximum		55	
		Range		39	
		Interquartile Range		18	
		Skewness		-.781	.717
		Kurtosis		.817	1.400

Appendix 5: Descriptive statistics engagement and functional area

Descriptives

	Functional area			Statistic	Std. Error
Total Engagement	Maintenance / Utilities	Mean		43.65	2.069
		95% Confidence Interval for Mean	Lower Bound	39.26	
			Upper Bound	48.03	
		5% Trimmed Mean		43.72	
		Median		44.00	
		Variance		72.743	
		Std. Deviation		8.529	
		Minimum		30	
		Maximum		56	
		Range		26	
		Interquartile Range		16	
		Skewness		-.039	.550
		Kurtosis		-1.299	1.063
	Production / IPTs	Mean		41.38	1.546
		95% Confidence Interval for Mean	Lower Bound	38.28	
			Upper Bound	44.47	
		5% Trimmed Mean		41.83	
		Median		42.00	
		Variance		133.839	
		Std. Deviation		11.569	
		Minimum		4	
		Maximum		62	
		Range		58	
		Interquartile Range		19	
		Skewness		-.615	.319
		Kurtosis		.774	.628
	Logistics	Mean		36.25	3.092
		95% Confidence Interval for Mean	Lower Bound	26.41	
			Upper Bound	46.09	
		5% Trimmed Mean		36.56	
		Median		39.00	
		Variance		38.250	
		Std. Deviation		6.185	
		Minimum		27	
		Maximum		40	
		Range		13	
		Interquartile Range		10	
		Skewness		-1.965	1.014
		Kurtosis		3.891	2.619
	Quality	Mean		40.46	2.202
		95% Confidence Interval for Mean	Lower Bound	35.95	
			Upper Bound	44.98	
		5% Trimmed Mean		40.90	
		Median		38.50	
		Variance		135.813	
		Std. Deviation		11.654	
		Minimum		12	
		Maximum		58	
		Range		46	
		Interquartile Range		18	
		Skewness		-.244	.441
		Kurtosis		-.272	.858
	Engineering / Safety	Mean		46.56	2.878
		95% Confidence Interval for Mean	Lower Bound	39.92	
			Upper Bound	53.19	
		5% Trimmed Mean		46.40	
		Median		48.00	
		Variance		74.528	
		Std. Deviation		8.633	
		Minimum		35	
		Maximum		61	
		Range		26	
		Interquartile Range		15	
		Skewness		.124	.717
		Kurtosis		-.608	1.400
	GTO / Finance	Mean		40.09	3.699
		95% Confidence Interval for Mean	Lower Bound	31.85	
			Upper Bound	48.33	
		5% Trimmed Mean		40.43	
		Median		43.00	
		Variance		150.491	
		Std. Deviation		12.267	
		Minimum		15	
		Maximum		59	
		Range		44	
		Interquartile Range		16	
		Skewness		-.506	.661
		Kurtosis		.554	1.279

Appendix 6: Descriptive statistics engagement and education level

Descriptives

	Education level			Statistic	Std. Error
Total Engagement	Up to Leaving certificate	Mean		43.11	2.053
		95% Confidence Interval for Mean	Lower Bound	38.94	
			Upper Bound	47.28	
		5% Trimmed Mean		43.87	
		Median		44.50	
		Variance		151.702	
		Std. Deviation		12.317	
		Minimum		4	
		Maximum		61	
		Range		57	
		Interquartile Range		20	
		Skewness		-.889	.393
		Kurtosis		1.267	.768
	Third level diploma	Mean		42.00	3.716
		95% Confidence Interval for Mean	Lower Bound	32.91	
			Upper Bound	51.09	
		5% Trimmed Mean		42.11	
		Median		44.00	
		Variance		96.667	
		Std. Deviation		9.832	
		Minimum		25	
		Maximum		57	
		Range		32	
		Interquartile Range		10	
		Skewness		-.407	.794
		Kurtosis		1.382	1.587
	Qualified Craftsperson	Mean		43.00	4.131
		95% Confidence Interval for Mean	Lower Bound	32.38	
			Upper Bound	53.62	
		5% Trimmed Mean		42.94	
		Median		42.50	
		Variance		102.400	
		Std. Deviation		10.119	
		Minimum		32	
		Maximum		55	
		Range		23	
		Interquartile Range		19	
		Skewness		.078	.845
		Kurtosis		-2.766	1.741
	Third level degree	Mean		40.21	2.093
		95% Confidence Interval for Mean	Lower Bound	35.92	
			Upper Bound	44.49	
		5% Trimmed Mean		40.63	
		Median		39.00	
		Variance		127.027	
		Std. Deviation		11.271	
		Minimum		12	
		Maximum		57	
		Range		45	
		Interquartile Range		17	
		Skewness		-.263	.434
		Kurtosis		-.143	.845
	Third level masters	Mean		42.83	2.047
		95% Confidence Interval for Mean	Lower Bound	38.51	
			Upper Bound	47.15	
		5% Trimmed Mean		42.65	
		Median		44.00	
		Variance		75.441	
		Std. Deviation		8.686	
		Minimum		31	
		Maximum		58	
		Range		27	
		Interquartile Range		16	
		Skewness		-.029	.536
		Kurtosis		-1.207	1.038
	Third level doctorate / post doc	Mean		43.80	3.483
		95% Confidence Interval for Mean	Lower Bound	35.92	
			Upper Bound	51.68	
		5% Trimmed Mean		43.56	
		Median		43.50	
		Variance		121.289	
		Std. Deviation		11.013	
		Minimum		30	
		Maximum		62	
		Range		32	
		Interquartile Range		16	
		Skewness		.599	.687
		Kurtosis		-.403	1.334

Appendix 7: Descriptive statistics engagement and further education while working

Descriptives

	Further education			Statistic	Std. Error
Total Engagement	Yes	Mean		42.40	1.279
		95% Confidence Interval for Mean	Lower Bound	39.84	
			Upper Bound	44.95	
		5% Trimmed Mean		42.76	
		Median		44.00	
		Variance		103.050	
		Std. Deviation		10.151	
		Minimum		12	
		Maximum		61	
		Range		49	
		Interquartile Range		14	
		Skewness		-.516	.302
		Kurtosis		.418	.595
	No	Mean		41.31	1.653
		95% Confidence Interval for Mean	Lower Bound	37.99	
			Upper Bound	44.63	
		5% Trimmed Mean		41.70	
		Median		39.00	
		Variance		139.340	
		Std. Deviation		11.804	
		Minimum		4	
		Maximum		62	
		Range		58	
		Interquartile Range		21	
		Skewness		-.383	.333
		Kurtosis		.474	.656

Appendix 8: Descriptive statistics engagement and impact of the training allowance

Descriptives

	Development allowance			Statistic	Std. Error
Total Engagement	Not at all	Mean		37.82	2.360
		95% Confidence Interval for Mean	Lower Bound	32.91	
			Upper Bound	42.73	
		5% Trimmed Mean		37.32	
		Median		34.50	
		Variance		122.537	
		Std. Deviation		11.070	
		Minimum		23	
		Maximum		62	
		Range		39	
		Interquartile Range		16	
		Skewness		.727	.491
		Kurtosis		-.411	.953
	A little	Mean		40.21	2.953
		95% Confidence Interval for Mean	Lower Bound	34.01	
			Upper Bound	46.42	
		5% Trimmed Mean		40.73	
		Median		34.00	
		Variance		165.731	
		Std. Deviation		12.874	
		Minimum		12	
		Maximum		59	
		Range		47	
		Interquartile Range		22	
		Skewness		-.153	.524
		Kurtosis		-.547	1.014
	Somewhat	Mean		40.91	1.478
		95% Confidence Interval for Mean	Lower Bound	37.94	
			Upper Bound	43.89	
		5% Trimmed Mean		41.62	
		Median		42.00	
		Variance		102.645	
		Std. Deviation		10.131	
		Minimum		4	
		Maximum		57	
		Range		53	
		Interquartile Range		11	
		Skewness		-1.141	.347
		Kurtosis		3.073	.681
	a lot	Mean		45.43	1.690
		95% Confidence Interval for Mean	Lower Bound	41.90	
			Upper Bound	48.95	
		5% Trimmed Mean		45.47	
		Median		42.00	
		Variance		59.957	
		Std. Deviation		7.743	
		Minimum		32	
		Maximum		58	
		Range		26	
		Interquartile Range		14	
		Skewness		.159	.501
		Kurtosis		-1.195	.972
	To a large extent	Mean		53.38	2.044
		95% Confidence Interval for Mean	Lower Bound	48.54	
			Upper Bound	58.21	
		5% Trimmed Mean		53.42	
		Median		52.50	
		Variance		33.411	
		Std. Deviation		5.780	
		Minimum		45	
		Maximum		61	
		Range		16	
		Interquartile Range		11	
		Skewness		.134	.752
		Kurtosis		-1.022	1.481

Appendix 9: Reasons for maintaining engagement by gender score

Reason code	Combined	Male	Female
1	237	**176**	**48**
6	367	**397**	**116**
7	392	**567**	**176**
8	399	**471**	**155**
5	489	**356**	**115**
2	534	**278**	**77**
10	538	**291**	**82**
9	605	**282**	**94**
4	651	**435**	**140**
3	786	**368**	**143**

Appendix 10: Reasons for maintaining engagement by union status score

Reason code	Combined	Union	Non-union
1	237	**88**	**144**
6	367	**116**	**404**
7	392	**185**	**581**
8	399	**149**	**481**
5	489	**97**	**373**
2	534	**98**	**255**
10	538	**86**	**293**
9	605	**81**	**300**
4	651	**133**	**447**
3	786	**122**	**398**

Appendix 11: Reasons for maintaining engagement by functional area score

Reason code	Combined	M/T	IPT	Log	Quality	Eng saf	GTO Fin
1	237	**46**	**112**	**12**	**42**	**13**	**12**
6	367	**104**	**254**	**10**	**87**	**34**	**45**
7	392	**132**	**372**	**22**	**159**	**31**	**79**
8	399	**102**	**316**	**21**	**128**	**20**	**64**
5	489	**89**	**219**	**18**	**98**	**26**	**39**
2	534	**52**	**179**	**17**	**79**	**12**	**28**
10	538	**60**	**194**	**12**	**77**	**16**	**33**
9	605	**46**	**176**	**19**	**107**	**15**	**36**
4	651	**15**	**297**	**15**	**116**	**27**	**50**
3	786	**94**	**246**	**19**	**97**	**26**	**54**

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