MINI-DISSERTATION

Exploring the behavioural competencies of the future project manager: Perspectives from a South African project management organisation

K.J. SEMPLE

21893330

Supervisor: J.A. Jordaan

November 2011

Mini-dissertation submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Potchefstroom campus of the North West University.

ABSTRACT

Project management is as much art as it is science. Competence of project managers is receiving increasing interest as more organisations accept that project performance has an impact on organisational performance. Scholars and practitioners of project management tend to agree that while the technical aspects of project management are important, it is the behavioural competencies, or soft skills, of project managers that are required for success – now and in the future. This study set out to explore the expected evolution of the behavioural skills and competencies of the project manager over the next decade. Secondary objectives of the study were to establish if perceptions differ amongst the respective demographic groups, the importance of leadership skills and how identified future behavioural competencies are addressed in current job profiles for project managers.

The research study began in the literature where projects and project management was introduced followed by an exploration of some of the trends and perceptions expected to impact on project management in the future. Projects of the future will be strongly influenced by technology with complexity and uncertainty as common themes. Leadership and flexibility will be key for project managers to survive in such a dynamic, hyper-connected environment.

A thorough literature study was conducted into the behavioural competencies of project managers especially with respect to the most widely used project management bodies of knowledge. The concept of competency was defined and a number of models of competency were presented. Soft skills relating to project managers were discussed including emotional intelligence which has received much attention recently. A comparison was made of the behavioural competencies of project managers as addressed in the IPMA International Competence Baseline 3.0, the APM Body of Knowledge and the PMI Body of knowledge. Concluding the literature study, the fifteen behavioural competencies from the IPMA International Competence Baseline were discussed drawing on insight from the literature.

An empirical study was completed with the aid of a new questionnaire designed using the behavioural competencies contained in the IPMA International Competence Baseline 3.0 as constructs. The questionnaire survey explored the perceptions of members in a South African project management organisation regarding the evolution of the importance given to the identified behavioural competencies. Analysis of the responses showed the questionnaire to be reliable and valid. Respondents indicated that they expect the following

project manager behavioural constructs to grow in importance in the future: ***Efficiency***, ***Leadership***, ***Creativity***, ***Openness*** and ***Engagement and Motivation***. Respondents expect the following behavioural constructs to be less important in the future: ***Ethics***, ***Values Appreciation***, ***Reliability***, ***Conflict and Crisis*** and ***Self-control***.

Structured interviews conducted to validate the survey results highlighted only that *Leadership* is an area that is expected to take on more importance for project managers in future. The interviews produced similar expectations to the literature regarding the future challenges for project management regarding complexity, uncertainty and the rate of change.

A review of Project Manager job profiles yielded that generally behavioural competencies for project managers are not comprehensively addressed with more attention required and to utilise research as a basis. Proficiency requirements and assessment of proficiencies remains a major challenge that must be addressed by organisations in future.

Conclusions regarding the findings of the research study were presented and recommendations for organisations and interested parties given. The research study was evaluated opposite the primary and secondary objectives with the conclusion that both were achieved. Finally, recommendations for further research into the behavioural competencies and related topics were proposed.

Keywords: Project management, project management organisation, behavioural competencies, leadership, emotional intelligence, competency framework, soft skills, future challenges for project management.

OPSOMMING

Projekbestuur is ‘n eksakte wetenskap, maar tegelykertyd ook ‘n kuns. Die belangrikheid van bevoegde projekbestuurders in die meeste organisasies ontvang meer aandag as gevolg van die bewustheid van die effek wat projekbestuur op die organisasie se prestasie het. Navorsers en projekbestuurders stem saam dat nie net die tegniese aspekte van projekbestuur belangrik is nie, maar dat gedrags- en mensevaardighede van projekbestuurders vereis word om sukses te verseker – nou en in die toekoms. Hierdie studie ondersoek die verwagte ontwikkeling van gedragsvaardighede en die bevoegdheid wat van projekbestuurders verwag word in die volgende dekade. Die studie evalueer ook of verskillende demografiese groepe verskillende persepsies van projekbestuur het, die belangrikheid van leierskap en of geïdentifiseerde vaardighede in huidige projekbestuurders se posbeskrywings aangespreek word.

Die navorsing begin met ‘n literatuurstudie waar projekte en projekbestuur ondersoek word, gevolg deur ‘n ondersoek na die tendense en persepsies wat projekbestuur in die toekoms mag beïnvloed. Tegniese kompleksiteit en onsekerheid is van die tendense wat projekte in die toekoms gaan affekteer. Projekbestuurders se oorlewing in die dinamiese, hipergekoppelde omgewings sal afhang van hul leierskap en aanpasbaarheid.

‘n In-diepte-literatuurstudie in verband met gedragsbevoegdhede van projekbestuurders, veral met betrekking tot die gebruik van beskikbare kennis in projekbestuur-organisasies is uitgevoer. Die konsep van bevoegdheid is gedefinieer en 'n aantal bevoegdheidsmodelle word voorgestel. Mensvaardighede met ‘n fokus op emosionele intelligensie van projekbestuurders word bespreek. Gedrags-bevoegdhede van projekbestuurders is vergelyk soos wat dit voorgestel word in die “IPMA Competence Baseline 3.0”, die “APM Body of Knowledge” en die “PMI Body of Knowledge”. Die literatuurstudie word afgesluit met ‘n bespreking van die vyftien gedrags-bevoegdhede van die “IPMA International Competence baseline”.

’n Nuut ontwerpte vraelys is ontwikkel deur die gedragsbevoegdhede soos vervat in die “IPMA International Competence Baseline 3.0” te gebruik. ‘n Empiriese studie is gedoen deur die vraelys te gebruik. Die vraelys is gebruik om die persepsies van lede in ‘n Suid-Afrikaanse projekbestuursorganisasie oor die toename in belangrikheid van geidentifiseerde gedragsbevoegdhede te versamel.

Evaluering van die response het aangedui dat dit betroubaar en geldig is. Die respondente het aangedui dat hulle verwag dat die volgende projekbestuur-gedragspatrone in die toekoms sal toeneem in belangrikheid: **Effektiwiteit**, **Leierskap**, **Kreatiwiteit**, **Openlikheid**, **Betrokkenheid en Motivering**. Respondente verwag die volgende gedrags patrone in die toekoms minder belangrik sal wees: **Etiek**, **Agting vir Waardes**, **Betroubaarheid**, **Konflik- en krisisbestuur** en **Selfbeheersing**. Gestruktureerde onderhoude is gehou om die resultate te bevestig en het getoon dat slegs Leierskap in die toekoms meer belangrik sal wees. Die onderhoude het soortgelyke resultate gelewer as die literatuur rakende die toekomstige uitdagings vir projekbestuurders ten opsigte van kompleksiteit, onsekerheid en die tempo van verandering.

'n Evaluasie van projekbestuur werksomskrywings het aangetoon dat algemene gedragsbevoegdhede nie omvattend aangespreek word nie. Meer fokus moet hieraan gegee word en navorsing moet as basis gebruik word. Vaardigheidsvereistes en assessering van vaardighede is nog steeds 'n uitdaging vir die meeste organisasies. Dit behoort in die toekoms aangespreek te word.

Gevolgtrekkings van die navorsingstudie word aangebied en aanbevelings vir organisasies en belangstellende partye word gegee. Beide die primêre en sekondêre doelwitte van die studie is bereik. Ten slotte word aanbevelings gemaak vir toekomstige studies in verband met gedrags-bevoegdhede en verwante onderwerpe.

Sleutelwoorde: Projekbestuur, projekbestuursorganisasie, gedragsvaardighede, leierskap, emosionele intelligensie, vaardigheidsraamwerk, mensvaardighede, toekomstige uitdagings vir projekbestuur.

DECLARATION

I declare that this mini-dissertation, submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the North West University, is my own work. It has not been submitted before for any degree or examination in any other university.

Keven John Semple November 2011

ACKNOWLEDGEMENTS

My sincerest appreciation goes out to:

- My wife, Tracy, for her patience and support throughout the MBA journey.
- My children, Kaitlyn and Michael, for enduring the long study hours and limited quality time.
- Johan Jordaan, my study leader, whose enthusiasm and advice was invaluable.
- Wilma Breytenbach, of North West University Statistical Consultation Services, for her input with the questionnaire design and assistance with the statistical analysis.
- Dr Daan de Villiers, for his input regarding the research topic and for the valuable information provided.
- My immediate colleagues for their support and understanding during the MBA. Thanks for picking up the slack.
- My employer, Sasol Technology, for affording me the opportunity to further my studies.
- All of my colleagues who took the time to complete yet another questionnaire in the name of research.
- The Potchefstroom Business School of the North West University for extending my thinking during the MBA.

CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF EQUATIONS

GLOSSARY OF TERMS

ANOVA	Analysis of Variance
ANSI	American National Standards Institute
APM	Association for Project Management
BOK	Body of Knowledge
CFA	Confirmatory Factor Analysis
CQ	Cultural Intelligence
EQ	Emotional Intelligence
ICB	International Competence Baseline
ICT	Information Communications and Technology
IEEE	Institute of Electrical and Electronic Engineers
IPMA	International Project Management Association
IQ	Cognitive Intelligence
MQ	Management Intelligence
MSA	Measure of Sampling Adequacy
NASA	National Aeronautics and Space Administration
PM	Project manager
PMBOK	Project Management Body of Knowledge
PMI	Project Management Institute
PMO	Project Management Organisation
SAS	Statistical Analysis System
SQ	Spiritual Intelligence

CHAPTER 1: NATURE AND SCOPE OF STUDY

1.1 INTRODUCTION

Organisations across the globe engage in projects to sustain and build competitive advantage in response to constant changes in their environment (Silvius, 2008:1). According to Silvius (2008:1), the ability to organise and manage change effectively and efficiently is a key success factor for business agility and sustainability. Economies have been transformed by globalisation, privatisation, digitisation, and technological advances; the result is a system of hyper-competitive enterprises in which organisations are pressurised to do things faster, better and cheaper (Thamhain, 2007:2057).

A project is defined as "a temporary endeavour undertaken to create a unique product, service, or result" (PMI, 2008:5). To optimise the use of increasingly scarce resources, careful control of the project is crucial. Project management is "the application of knowledge, skills, tools, and techniques to project activities to meet project requirements" (PMI, 2008:6). Project management is not new – it has been exercised for thousands of years; major construction undertakings have been recorded throughout history (Wideman, 1995:71). To achieve project objectives, a project manager is assigned by the organisation to each project. Recently in the 20th century, project management became the subject of more serious study leading to formulisation and optimisation (Wideman, 1995:71).

In researching the future of project management in the literature, Silvius (2008:1-2) highlights a number of issues which stand out:

- There is agreement by authors that companies need to constantly change to ensure their competitiveness in the future. Change will be organised mostly in projects. Project management thus is a core competence of any organisation.
- Project management in the future will be required to focus more on the business context of a project and less on the iron triangle constraints of cost, schedule and quality. This orientation shift is necessitated by the dynamic and turbulent nature of the future environment which has goals that will not remain fixed for any realistic period of time.
- In alignment with the points above, "soft skills" and leadership become more important in relation to traditional technical project management skills.

- Authors agree that project management is emerging and developing into a recognised profession. This development is supported by increasing scholarly interest in the field of project management.

The competence of the project manager is a critical factor that influences the outcome of a project (Stevenson & Starkweather, 2009:663). Mirabile (1997:75) defines competency as "a knowledge, skill, ability, or characteristic associated with high performance on a job, such as problem solving, analytical thinking or leadership". The definition and meaning of skill in literature is varied. Skill is defined by the OED (2010) as "the ability to do something well". Barrow (1987:6) highlights that skill may be used in conjunction with physical, intellectual, perceptual, social, creative and interpersonal operations. Barrow (1987:6) points out that skills may be discrete (such as clicking one's fingers) while others may not be readily disentangled (for example the skills involved to ride a bike). Some skills are readily perceptible and have clear boundaries (for example clicking one's fingers) and others are not (for example the skills of a project manager) (Barrow, 1987:6). Barrow (1987:7) suggests that a necessary condition for something to be considered as a skill is that it be developed, learned or acquired. Bloom and Kitagawa (1999:12) refer to individuals as being skilful when "they can identify desirable and achievable outcomes and are able to take appropriate steps to achieve them". Skill is commonly used to refer to a noteworthy level of accomplishment with its roots in the Old Norse root word *skil*, meaning distinction (Bloom & Kitagawa, 1999:12-13). Bloom and Kitagawa (1999:13) indicate that skills are active qualities in three critical senses: skills are called forth in situations that require action, skills only manifest themselves in action, and abilities are not valued in times or circumstances where the abilities are no longer adequate.

The International Project Management Association (IPMA) lists 46 competencies for project managers in three categories in version 3 of the International Competence Baseline (ICB) (IPMA, 2006:6):

- **Technical competencies** for project management (20 competencies)
- **Behavioural competencies** of project personnel (15 competencies)
- **Contextual competencies** of projects, programs and portfolios (11 competencies)

The Project Management Body of Knowledge (PMBOK) highlights that to manage a project effectively a project manager must possess the following characteristics over and above any

area specific skills and general management proficiencies required by the project (PMI, 2008:13):

- **Knowledge** – what the project manager knows about project management.
- **Performance** – what the project manager is able to do or achieve while applying their project management knowledge.
- **Personal** – how the project manager behaves when performing the project or related activity encompassing attitudes, core personality characteristics and leadership – the ability to provide guidance to the project team while meeting project objectives and balancing project constraints.

The Australian Vision 2020 Report acknowledges the following attributes and skills required for managers of the future (summarised by Goh, Coaker and Bullen, 2008:S2E-5):

- The ability to manage a global workforce, diversity in the workplace and being able to adapt to various cultures.
- Intellectual capacity, high analytical and decision making skills, and a deep knowledge of the enterprise or industry.
- High emotional intelligence.
- Strong interpersonal and leadership skills.
- Pursuing life-long learning.
- High energy levels and resilience and the ability to balance work/life demand.

Other relevant insights for the future management concluded in the investigation by Goh *et al* (2008:S2E-5) are:

- The perception that personal attributes are more important than postgraduate qualifications.
- The most important training requirements are leadership, communication skills and financial training.
- Key themes for 2020 are globalisation, cultural diversity in the workforce, team orientations and sustainability.
- In 2020, managers will have more individual pressures and demands and will find it more difficult to achieve the desirable work/life balance.
- In 2020, industry will prefer managers with “deep knowledge” over those with “generalist knowledge”.

1.2 BACKGROUND TO THE STUDY

By answering the question of how a project manager's skills and competencies will evolve over the next two decades is of relevance to organisations, educators and importantly for project management professionals. Much research has been conducted on the technical and contextual competencies as categorised by the IPMA and the knowledge and performance proficiencies classified by the PMI. There is a need to further research into the behavioural (IPMA) and personal (PMI) skills and competencies of a project manager and in particular what is needed for success in the future project landscape. The study will contribute to the project management body of knowledge assisting in career planning for project managers, skills and competence development for project managers by organisations and input into development of training programmes by educators.

1.3 PROBLEM STATEMENT

The study sets out to explore the expectations of project management professionals regarding the evolution of the behavioural skills and competencies of the successful project manager of the future (circa 2020). The expected future project management landscape will form the context for the development of specific project management skills and competencies. The study will focus on the personal and behavioural skills and competencies required by project managers of the future which have been identified by many scholars as being critical for success (and survival) in the global competitive environment of the future.

1.4 OBJECTIVES OF THE STUDY

1.4.1 PRIMARY OBJECTIVE

The main objective of the study is to research the evolution of project manager behavioural skills and competencies over the next decade and to answer the following questions:

- What project manager behavioural skills and competencies will be required for successful project execution?
- How will project manager skills and competencies change from the current basis published by the IPMA in version 3 of the International Competence Baseline (IPMA, 2006)? Which will grow in importance and which will diminish?

1.4.2 SECONDARY OBJECTIVES

The secondary objectives of the study are the following:

- To establish if the demographics (for example age, experience) of responding project management professionals influences their perception of the future behavioural skills and competencies of project managers.
- To evaluate the importance of leadership skills required for successful project execution.
- To compare the required future behavioural skills and competencies of project managers against current job profiles for project management professionals in the construction industry in South Africa.

1.5 SCOPE OF THE STUDY

The study will focus on expectations and perceptions of project management professionals in a South African project management organisation (PMO) of the behavioural skills and competencies of project managers of the future.

1.6 RESEARCH METHODOLOGY

The following research methodology is proposed for the study:

1.6.1 LITERATURE STUDY

Literature will be studied with focus areas as below:

- Projects and the management of projects.
- The global business landscape of the future and the impacts on project management.
- Project management bodies of knowledge.
- Skills and competences of project managers (current and future).
- Project leadership and stewardship.
- Job profiles of project managers.

1.6.2 EMPIRICAL STUDY

An empirical study will be carried out using a combined approach. Firstly, based on the literature study a questionnaire will be developed to survey project management professionals on their expectations and perceptions of the behavioural skills and competencies of project managers in the future. Secondly, follow-up interviews with respondents will be conducted to provide clarification and further insight to aspects investigated via the questionnaire. Thirdly, audits will be conducted on project manager job profiles to compare the current required make-up of project managers.

1.7 LIMITATIONS OF THE STUDY

The study will focus on the expectations of project management professionals in a South African project management organisation regarding the skills and competencies of project managers in the future.

1.8 LAYOUT OF THE STUDY

Chapter 1: Nature and scope of study

This chapter sets the context and background for the proposed research study. The problem statement is formulated and the research goals, research methods, and limitations are stated.

Chapter 2: Literature Study – Future challenges for project management

In this chapter projects and project management is introduced. The expectations of the future global business landscape will be explored in the literature as a basis to the study of the project manager behavioural competencies required for the next decade.

Chapter 3: Literature Study – Project Manager Behavioural Competencies

In this chapter the literature study is presented focussing on the behavioural skills and competencies of project managers now and those required for survival and success in the future (a decade from now - 2020). In particular, project leadership as a future core competence and skill will be investigated.

Chapter 4: Empirical Study

The empirical study contained in this chapter will investigate the theory described from the literature survey and will address the objectives of the research study. The results of the empirical study and analysis will be discussed.

Chapter 5: Conclusions and Recommendations

Based on the empirical study and analysis, conclusions will be drawn and recommendations made.

CHAPTER 2: FUTURE CHALLENGES FOR PROJECT MANAGEMENT

2.1 INTRODUCTION

Predicting the future or even speculating about it is often described as a fool's game. Although the future is uncertain, awareness of trends however subtle is the starting point to preparedness. Projections into the future rather than predictions position organisations to take advantage of the changes. No crystal ball is available to view the future; however this chapter incorporates the views and wisdom of a number of experienced project management industry professionals from literature and industry publications.

In the last two hundred years we have seen an increase in the rate of projects undertaken as rapid developments in social, scientific, technical and political arenas have been experienced (Barnes, 2002:2). We may assume that the growth rate of the number of projects is still increasing. Project management as a science is changing and developing fast; becoming more concerned with managing the interactions of people (the soft techniques) and less with producing documents and processing numbers (the hard techniques) (Barnes, 2002:2).

This chapter introduces projects and project management and then seeks to explore some of the trends and perceptions that may impact on project management in the next decade.

2.2 PROJECTS AND PROJECT MANAGEMENT

Many similar definitions for a project can be found in literature. The PMI (2008:5) defines a project as a "temporary endeavour undertaking to create a unique product". The APM (2006:xv) states that a project is a "unique, transient endeavour undertaken to achieve a desired outcome". The IPMA (2006:13) defines a project as a "time and cost constrained operation to realise a set of defined deliverables (the scope to fulfil the project's objectives) up to quality standards and requirements". Thus a project can best be described as a solution to a problem or responding to a need. Heerkens (2002:10) states succinctly that a project should either make money or save money and should therefore be financially justifiable for an organisation. The exception is projects that an organisation executes in

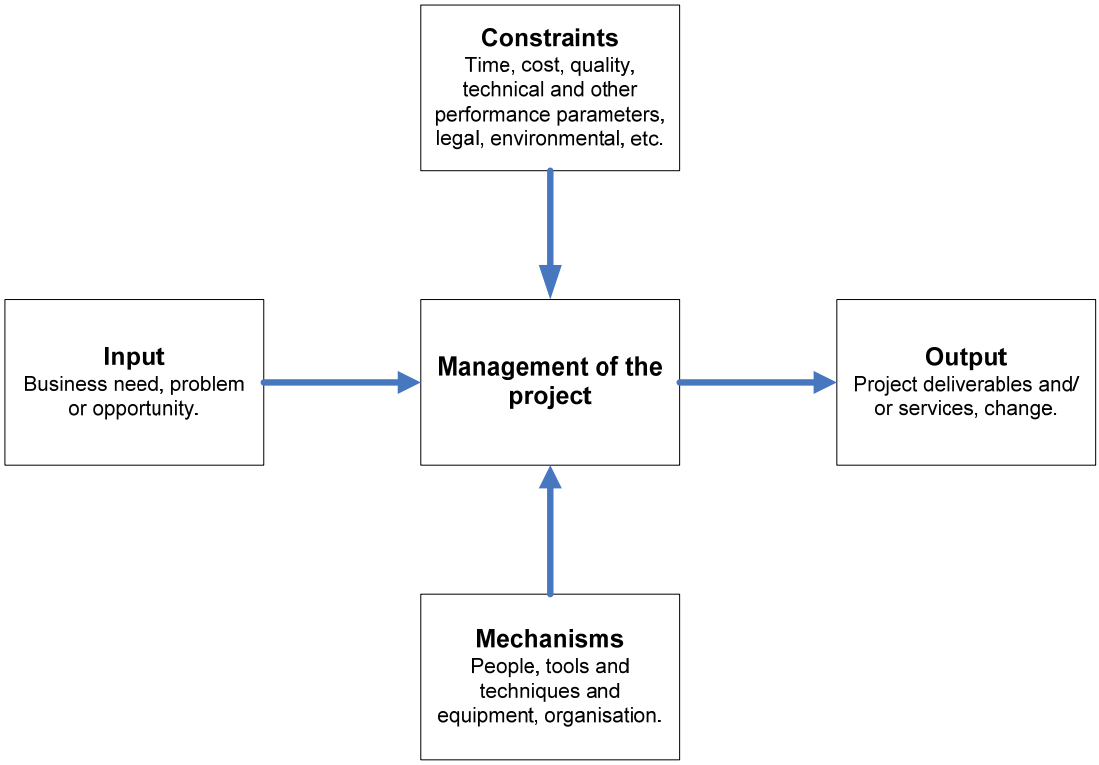
order to remain in business, for example achieving legal compliance. Since projects are temporary in nature, they have a clear start and end. In between, a project progresses through phases usually following a preferred sequence of execution. Projects by their nature are unique, one-off undertakings. This means that future projects, even if similar, will not be executed in the same way, with the same people and in the same context. During the execution of a project there will always be uncertainty which puts the project outcomes at risk and thus requires skilful management.

Ferraro (2005:12) summarises the aspects of a project aptly:

- Is unique.
- Responds to a need or problem.
- Has not been done before.
- Requires borrowed resources.
- Has a customer and sponsor.
- Has expected benefits.
- Entails risk.

The PMI (2008:6) defines project management as “the application of knowledge, skills, tools and techniques to project activities to meet project requirements”. The APM (2006:2) defines project management as “the process by which projects are defined, planned, monitored, controlled and delivered such that the agreed benefits are realised”. The project manager thus is required to deliver project outcomes by skilful application of skills, tools and techniques. Importantly the project manager does not operate independently; he achieves outcomes through the project team. Heerkens (2002:11) describes project managers as the stewards of the resources (e.g. materials, time, money, and labour) that will be required by the project. In managing the project, the project manager applies resources sparingly, using them as effectively as possible. Figure 1 gives an overview of the concept and process of project management.

Figure 1. The project management process



Source: APM (2006:3)

Many projects when completed are not successful. The PMI (2008:9) highlights that success is "measured by product and project quality, timeliness, budget compliance, and degree of customer satisfaction". The APM (2006:18) contends that project success "is the satisfaction of stakeholder needs and is measured by the success criteria as identified and agreed at the start of the project". Thus, although a project may be viewed as successful by the project team when the triple constraints of time, cost and quality have been achieved, it really is not successful if stakeholder needs have not be met and the organisational benefits realised.

With this in mind, Heerkens (2002:26-27) suggests a four-level framework to assess the success of any project:

- **Level I – Meeting project targets**
  - Did the project meet the original targets of cost, schedule, quality and functionality?
- **Level II – Project efficiency**
  - How well was the project managed?
- **Level III – Customer or user utility**
  - To what extent did the project fulfil its mission of solving a problem, exploiting an opportunity, or otherwise satisfying a need?
- **Level IV – Organisational improvement**
  - Did the organisation learn from the project?

2.3 FUTURE LANDSCAPE

How will the future workplace develop? What will the future project environment look like? These are very pertinent questions of interest to most organisations. In the coming decade, strategist Petty (2009:15) predicts that organisations will experience the following powerful market forces:

- Globalisation.
- Time compression.
- Shrinking product life cycles.
- Rise of the knowledge workers.
- How and where we work.
- Changing generations.
- Constant, disruptive competition.
- Growing complexity.
- Economy and environment.
- Customers with more choices.

Petty (2009:15) asserts that organisations will be under pressure to execute projects on strategic priorities.

Gratton (2010) of the London Business School posits that work will change dramatically in future in ways that we can hardly imagine. In Gratton's research of what external forces will fundamentally change the way work is done by 2025, her team found the following five forces:

- Technological developments.
- Globalisation.
- Demographic changes.
- Societal changes.
- Low-carbon developments.

Gratton (2010:21) stresses that the future workplace will bring both challenges and opportunities. Some of the changes (for example, flexible working) are inevitable and organisations should look to embrace them sooner rather than later.

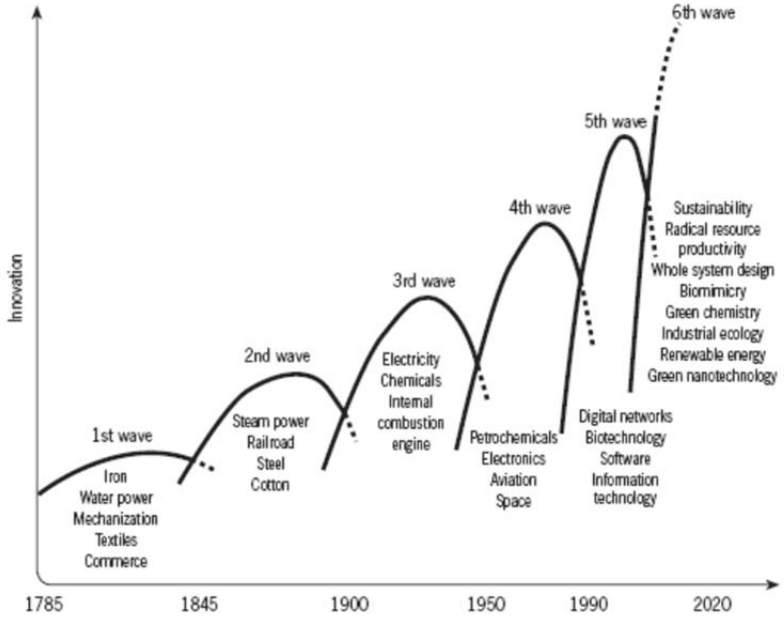
2.3.1 CHANGE

According to Kuhn's theory of punctuated equilibrium, change occurs in paradigm-breaking bursts replacing existing theories with new (Dombkins, 2009:3). In science, relative stability is observed when core theories are broadly accepted, however research builds on these theories to the extent that eventually the dominant theories fail to be able to explain, predict or deliver desired outcomes (Dombkins, 2009:3). New innovative theories emerge, despite resistance from those with vested interests in the old theories, to eventually become broadly accepted (Dombkins, 2009:3). Since formalisation of project management as a science in 1958, a period of subtle development continued until the late 1980s (Dombkins, 2009:3). Concerns over poor project outcomes and breaches of governance in the late 1980s triggered a spate of innovations in the 1990s and early 2000s (Dombkins, 2009:3). A new stable period is envisaged for the next ten years according to a paradigm where it is recognised that projects vary in their levels of certainty and emergence – "fit for purpose" approaches need to be applied (Dombkins, 2009:3).

Hargroves and Smith (2005:17) highlight that since the late 18th century there have been five to six significant major waves of innovation, with each wave representing technological solutions to problems thought to be intractable that seek to satisfy a genuine need in the market (see Figure 2). The current 5th wave encompasses digital networks, biotechnology,

software and information technology (Hargroves & Smith, 2005:17). The Information and Communications Technology (ICT) wave of innovation has been driven by computer processing power, network bandwidth and data storage (Hargroves & Smith, 2005:17). The 6th wave, already upon us, is associated with sustainability, radical resource productivity, whole system design, bio mimicry, green chemistry, industrial ecology, renewable energy and green nanotechnology (Hargroves & Smith, 2005:17). Importantly, the decreasing duration of each innovation wave is bringing with it increasing challenges and opportunities for mankind.

Figure 2. Waves of innovation



Source: Hargroves and Smith (2005:17)

Wideman (2001:6) asserts that as the world's population grows and natural resources diminish, change will accelerate and project management will continue to provide an orderly way to handle these changes.

2.3.2 GLOBALISATION

Globalisation will contribute to project complexity via the requirement for more distributed and multicultural project teams (Jugdev, Muller & Hutchison, 2009:234). Thomas, Jaselskis

and McDermott (2009:292) highlight that the 21st century has seen an increase in the transfer of knowledge resources around the globe with remotely connected virtual teams working continuously to drive project outcomes. This way of working provides both new opportunities and challenges for a project manager.

Project teams will go beyond geographical, political or organisational boundaries during project execution (Weinstein & Jaques, 2009:360).

Companies working in the international arena are required to work with people from different cultures that have varying skill sets and language capabilities (Thomas, Jaselskis & McDermott, 2009:295).

2.3.3 ORGANISATIONAL STRUCTURE

Leading business strategist, Professor Richard Scase suggests that today's challenge is how to capture and engage young talent that is highly individualistic, highly iconoclastic and highly non-conformist (Strategic Direction, 2007:30). He contends that organisations need to create an environment that is conducive of engagement and where work can be enjoyed. There will be increasing focus on the performance of people as a core company asset (Nicholson & Nairn, 2006:3).

In a study exploring expectations of the workplace of the future, Davis and Blass (2007:47) found that respondents expected a move away from the conventional "company worker" to a more widely skilled professional being autonomous, flexible and responsive. They suggest an interesting trend away from qualifications towards lifelong learning. In future there will be more interest in actual competence and proven ability as measures of learning rather than certificates. A formal degree only enables entry to the organisation. Rasmus (2007:33) agrees stating that the most important items on the resume will be "proof of the ability to learn, to incorporate, to synthesise learning, and to turn new knowledge into new value".

The future workplace is envisaged to be "hi-tech, virtual and global, diverse, competitive but autonomous" (Davis & Blass, 2007:50). Workers will organise their work patterns to fit the lifestyle they desire. Davis and Blass (2007:50) suggest that interpersonal skills will be the most important leadership skill required in managing virtual relationships.

Technology and global connectivity has enabled virtual teams that collaborate electronically on projects. With outsourcing collaboration is often extended outside of the immediate project team. Project teams now have virtual performers. There are growing numbers of domestic virtual performers; team members who work from home. Virtual performers create new challenges for both organisations and managers requiring processes, procedures, standards and guidelines to be in place to facilitate successful collaboration (Thomas, Jaselskis & McDermott, 2009:292). Thamhain (2009:373) reiterates the complex management issues involved with leading geographically dispersed teams. Amongst these are work process, integration, unified control and systemic networking.

Flexible working hours and arrangements are highlighted by many authors. In a study by Gratton (2010:23) work flexibility was seen as key to the future by many respondents. Many software companies already leverage a 24-hour continuous operation concept by "following the sun". Other flexible working arrangements already offered by organisations include home working, part-time working, job sharing and flexi-hours. Such flexibility, although meeting and accommodating the personal needs of employees, creates many challenges in performance management.

2.3.4 HUMAN RESOURCES

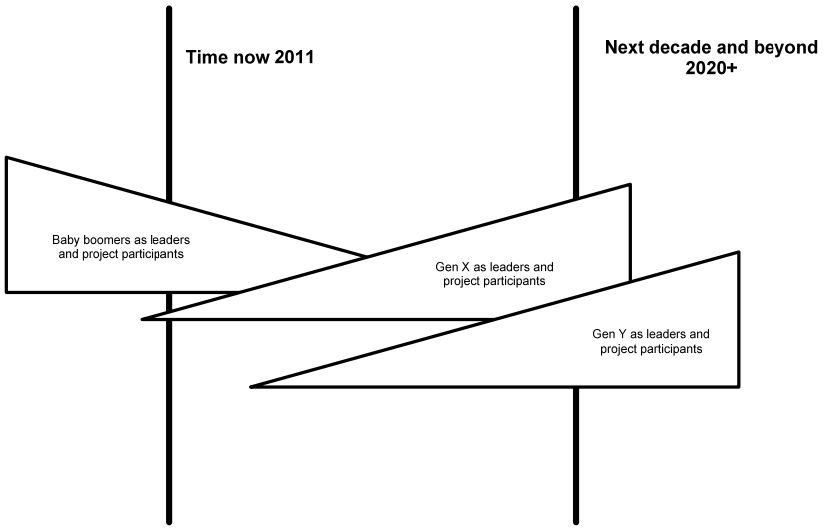
The world's population is ageing. Although the world population is expected to climb to nine billion by 2050, growth rates are declining (UN, 2011:1). People are having fewer children and living longer. The implication for organisations is an ageing workforce with unique challenges such as high accumulated vacation time, greater risk of serious illness and unique motivations. There is a growing trend of people retiring later putting pressure on jobs for young people starting their careers (Thomas, Krahn & George, 2009:138-139).

According to Thomas, Krahn and George (2009:140), the continued shift in population from the west to the east (e.g. India and China) together with increased immigration to the west will lead to significantly higher levels of cross-cultural differences in the workplace. Accommodating cultural differences of a multifaceted workforce will bring a multitude of management challenges.

Project managers are already grappling with the challenges brought about by multiple generations in the workplace and in their project teams. It is not uncommon today to find

four generations in the workplace: Traditionalists (born 1925 to 1942), Baby Boomers (born 1943 to 1960), Generation X (born 1961 to 1981) and Generation Y or Millennials (born 1982 to 1999) (Kinoshita & Plaistowe, 2009:2). Generation Z will enter the workplace during this decade. Each generation has different expectations and demands relating to personal life and career (Kinoshita & Plaistowe, 2009:2). Tulgan (2007:16-18), an expert on young people in the workplace, believes that although Generation Y are the most maintenance intensive generation in the world's history, they are likely to be the most high performing. The next decade will be one where Baby Boomers no longer dominate and where Generation X and Generation Y start to play stronger roles (Nicholson & Nairn, 2006:3). See Figure 3 for the generational handover of leadership in the workplace. Some of the greatest challenges for project managers will be to ensure effective communication and project productivity (Jugdev *et al*, 2009:235). Each generation brings value but it is up to the organisation to capitalise on this value (Townley, 2010:10). Accordingly, project managers of the future will need to balance technical skills with learning and teaching skills (Rasmus, 2007:33).

Figure 3. Generational handover of leadership



Source: Lloyd-Walker and Walker (2011:390)

2.3.5 KNOWLEDGE MANAGEMENT

Looking ahead to the future, knowledge management will be decisively more important than now (Franklin, Jabnoun & Dharwadker, 2009:103). Knowledge management can be described in terms of intellectual capital which is knowledge assets that are attributed to an organisation and contributing towards the competitiveness of the organisation (Marr, Schiuma & Neely, 2004:553-554). Knowledge assets are intangible, difficult to measure and often comprise the skills and know-how of people in the organisation. Franklin *et al* (2009:104) posit that project managers (circa 2025) will require new competencies to exploit the abundance of knowledge available from masses of information and data generated. They predict that project managers will be challenged to develop and maintain a working knowledge of ever-improving technologies providing business intelligence and knowledge mined from overwhelming volumes of information. Franklin *et al* (2009:112) see the capture of knowledge from highly trained and experienced professions as being a critical success factor for the development of less experienced project management professionals. This knowledge must be available and easily retrievable when needed. Jugdev *et al* (2009:231) point out that intangible resources (e.g. tacit knowledge and know-how) are more likely to be sources of competitive advantage than tangible resources.
What remains a formidable challenge is the knowledge transfer from retiring professionals to the next generation (Thomas, Jaselskis & McDermott, 2009:291).

2.3.6 INNOVATION

Scase (2006:16) points out that to be successful in the global highly competitive marketplace, organisations will need to have employees that are inspired, motivated and encouraged to become more entrepreneurial with new ideas and suggestions. Innovation must be encouraged through the organisation's culture which requires leadership and calls on the exercise of emotional, intuitive skills (Scase, 2006:16).

There is a growing trend by companies to gather ideas using "crowdsourcing" and other social networking tools (Fister Gale, 2008:38). The Merriam-Webster dictionary (2011) defines crowdsourcing as "the practice of obtaining needed services, ideas, or content by soliciting contributions from a large group of people and especially from the online community rather than from traditional employees or suppliers". Such consumer collaboration can be highly effective for companies to bring new products and services into

the market or make improvements to existing offerings. Crowdsourcing is already used by organisations who seek to solve complex problems and these solutions by individuals from the "crowd" usually cost a fraction of what the organisation would have paid (Howe, 2006). Crowdsourcing could have a significant impact on how project work is carried out.

Gratton (2010:21) emphasizes that it is by combining and connecting know-how, competencies and networks that real innovative possibilities come to life. Being part of the wise crowd will be critically important in future to create leverage. Gratton posits that it is all about high-value networks.

2.3.7 SKILLS

The role of the project manager is changing. The project manager is required to think broader than the basic skills of scheduling, budgeting and resource management taking a systems approach and viewing the project from a higher level than before. Project managers need to have a more multidisciplinary approach demanding increased technical skills but more importantly having superior interpersonal and multicultural skills (Thomas, Jaselskis & McDermott, 2009:298-302). Project managers will need to become more proactive system integrators but at the same time being extremely adept to manage unforeseen issues that arise. In the future management of risk will become increasingly important (Thomas, Jaselskis & McDermott, 2009:298-302).

Project management practitioners and teams of the future will have competencies that have significantly evolved by 2025. The future work force will comprise managers and leaders that have grown up in a hyper-connected world each bringing new sets of skills, capabilities, personalities and work methods with them. Future project managers will have competencies that represent a merging of traditional project management areas with those of general business management. Project managers will require skills of coalition building and stakeholder management as they increasingly interface with a wide range of stakeholders. Coalition building in particular is an uncommon skill among today's project managers. Following the recent trend of increased specialisation, project managers of the future may become more focused on and competent in a narrower subject area (Weinstein & Jaques, 2009:356-357).

Thomas and Mengel (2008:313) assert that for project managers to survive the increasing requirements of complex projects which are conducted on the “edge of chaos” they need to be proficient in supporting and fostering continuous change, creative and critical reflection, self-organised networking, virtual and cross-cultural communication, coping with uncertainty and various frames of reference, increasing self-knowledge and the ability to build and contribute to high-performance teams. They state that project managers will need skills and capabilities to create buy-in and provide orientation in environments that are often complex, unknown and uncertain. Using emotional and spiritual skills, project managers must be able to lead the changes into a future that is unknown, one at the edge of chaos. Project management education to achieve these skills and capabilities requires more than the transfer of know what or know how (Thomas & Mengel, 2008:312). This thinking is echoed by Weaver (2007:9) who indicates that for project management to succeed, project managers (and senior management) need to embrace uncertainty. Rather than expecting predictability they need to learn skills to manage the “variability of reality as it unfolds” (Weaver, 2007:9).

Stefanovic and Shenhar (2006) suggest that the traditional approach to project management is no longer suitable and that a model of strategic project leadership should be adopted. Projects are for business results and project managers need to combine the strategic, operational and human sides of leadership.

There will be increased demand for multicultural and multilingual capabilities. Jugdev *et al*, (2009:234) indicate that projects will become complex by the requirement to communicate in multiple languages, as developing economies growing more dominant may not want to use English as the language of commerce.

Thomas, Jaselskis and McDermott (2009:292) state that increasingly project managers need to look to improvements in productivity and efficiency to mitigate workforce shortages, sustainability pressures and increasing global competition. To achieve significant productivity improvements, the project team needs to embrace new technologies (Thomas, Jaselskis & McDermott, 2009:292).

Weinstein and Jaques (2009:360) assert that project managers of the future will be expected to be competent in the use and leverage of social networking especially for communications to the project team and stakeholders (both internal and external). They posit that the

openness of such communications into the public domain will require that the project manager have strong communication skills, and in particular diplomatic acumen. Project managers will be required to improve the efficiency and effectiveness of meetings. Given that more and more meetings will be conducted in a virtual environment and not face-to-face, project managers will need to be capable facilitators (Weinstein & Jaques, 2009:360).

To be successful in future organisations will need to do more than just acquire known skills; they will need to invent and become accustomed to a set of entirely new skills (Rasmus, 2007:33).

2.3.8 CONNECTIVITY

We live in a hyper-connected world in which global communications are instantaneous. Project managers have opportunities for far greater collaboration. With such mass collaboration, projects may obtain solutions from non-traditional sources, i.e. those with the best ideas rather than from within the project team (Thomas, Jaselskis & McDermott, 2009:300). Weinstein and Jaques (2009:346) indicate that organisations will utilise all means of electronic connectivity as tools to communicate and that these tools will be widely available to most people. Social networking will be prolific (Weinstein & Jaques, 2009:346).

2.3.9 ENVIRONMENT

Sustainability considerations have been at the forefront of nearly all recent projects. Climate-change is high on the agenda and projects are under pressure to be carbon-neutral or even carbon-negative. Project managers will need have a greater appreciation for environmental and life-cycle issues when planning and executing projects (Thomas, Jaselskis & McDermott, 2009:292).

Fister Gale (2008:39) highlights that corporate social responsibility has become entrenched as a license to operate in business. Corporate social responsibility refers to an organisation's environmental policies, charitable giving and social involvement. Project execution will need to take cognisance of this.

We find ourselves in the "era of insufficient plenty". This term was coined by John Voeller, the chief information officer of a major U.S. engineering company. For over a century we

have enjoyed abundance and developing countries could obtain what they needed (for a price). Voeller (2009:3) warns that in future, some of today's resources will not be available at any price. Innovation in science and engineering in addition to global collaborative efforts will be required to solve these challenges as the technology community looks to biotechnology, nanotechnology and quantum technology for the next "big thing" (Voeller, 2009:36). Project management is utilised not only to drive these developments but also to implement them.

2.3.10 PROJECTS

Organisations must continually innovate to conduct project work better at lower costs to remain competitive. Ireland (2008:1) warns that with resource costs rising, project managers will be expected to do more with less during project execution to deliver products and services that meet the clients' needs. In striving for both efficiency and effectiveness, project managers must eliminate all waste not only in processes, but in the careful assignment and application of skills to the project (Ireland, 2008:1-2). To be successful a project manager needs to have competence in the three categories of project management as defined by the IPMA namely: technical, contextual and behavioural.

Duggal (2001:2) states that it is generally agreed in the project management fraternity that project management is 20 percent science and 80 percent art. The art of project management is knowing when to apply the respective tools and in what context (Pennypacker, 2009:216). Today, successful project management is about effective communications, trust, integrity, flexibility, rapid decision-making, problem solving and customer satisfaction (Duggal, 2001:2). There has been a definite shift to the "human" side of project management (Wideman, 2001:2). Project management has incorporated techniques for equitably and effectively dealing with people (Wideman, 2001:2). Wideman (2001:6) highlights that there is greater need for what he terms "participative management" with increasing involvement of stakeholders and constituents in projects. We can expect there to be a trend towards firmer leadership in projects, an attribute that Wideman claims is much needed in the world of today. Project management leadership concepts will progressively change. This will be in response to external demands – a public that is well informed and a workforce that is more educated. These leadership concepts will embrace the ICT revolution, distributed leadership in which there is a sharing of power and extension

of team responsibility with accountability. New skill sets will be identified and education developed for transferring these skills to project managers (Wideman, 2001:6).

Project management will persist as a discipline that is experiential. According to Jugdev *et al* (2009:237), learning is best achieved by practicing, mentoring and job shadowing, noting that 80 percent of workplace learning occurs informally. Jugdev *et al* (2009:237) suggest that there will be an increased future focus on the interpersonal dimensions of project management.

In providing a solution for meeting our future energy needs, it is envisaged by the Construction Industry Institute (CII) that the world community will be focused more holistically developing mega-projects that are certain to challenge the most skilled teams (Thomas, Jaselskis & McDermott, 2009:300-301).

2.4 CONCLUSION

Clearly the rate of change will not abate in the foreseeable future. There is agreement that projects and project management will be critical to implementing such change. It is expected that projects of the future will be strongly influenced by technology. There will be more mega-projects. Project execution will need to embrace complexity and uncertainty. Project managers and their teams will be required to make sense of masses on data, turning it into information that assists them in driving project outcomes. Organisations and projects will be playing in the global arena competing for resources. Leadership and flexibility will be key. Skills of project managers will change to ensure survival in such a dynamic, hyper-connected environment. Soft skills are more important and relevant in an organisational environment which is becoming increasingly virtual. Social networking will become a core-competence not only for project managers but for workers in general. Social responsibility and sustainability will come to the fore as we enter the “era of insufficient plenty”. An understanding of these developing trends allows organisations, and project managers, to prepare themselves. Challenges such as these bring with them many possibilities and opportunities.

CHAPTER 3: PROJECT MANAGER BEHAVIOURAL COMPETENCIES

3.1 INTRODUCTION

Individuals with technical or managerial skills and competence often find themselves in the role of project manager without having made a determined career choice and many times without appropriate support and development. Ensworth (2003:1) refers to them as "accidental project managers" who are required to sink or swim.

Competence of project managers is receiving increasing interest. Studies show that it has a major impact on project performance and ultimately on the performance of a business – see Figure 4 (Crawford, 2005:7).

Figure 4. Relationship between project management competence and organisational performance

Source: Crawford (2005:8)

Pellegrinelli and Garagna (2010:1-2) contend that many organisations do not have well established career paths for project managers and very few have competence frameworks based on rigorous research that may be utilised when making appointments or decisions on career progression. Even in the cases where competency frameworks are in place, the competence of project managers is mostly based on the subjective assessments of managers.

Hartman (2008:258) argues that to determine the generic skills needed to effectively manage a particular project is nearly impossible as what is required of the project manager changes significantly depending on the unique project challenges presented. Projects vary in complexity, uncertainty, risk and context for example.

This chapter looks critically at the most widely used project management bodies of knowledge with respect to the behavioural competencies of project managers. The concept of competency is defined and some models of competency are presented. Soft skills relating to project managers are discussed including emotional intelligence which has received much attention in the last decade. A comparison is made of the behavioural competencies of project managers as addressed in the IPMA International Competence Baseline 3.0, the APM Body of Knowledge and the PMI Body of Knowledge. Finally, the fifteen behavioural competences from the IPMA International Competence Baseline 3.0 are discussed drawing on insight from the literature.

3.2 PROJECT MANAGEMENT BODIES OF KNOWLEDGE

Knowledge within the project management profession is captured in project management bodies of knowledge (PMBOK). Originally documented by American Defence and NASA, the Project Management Institute (PMI) created a standardised version of the PMBOK and published the first edition of the PMBOK in 1996. In 2008 the PMI released the fourth edition. The International Project Management Association (IPMA), published their International Competence Baseline (ICB) in 1996 and it is now in the third edition ICB 3.0 published in 2006 (Peng, Junwen & Huating, 2007:107). The Association of Project Management (APM) based in the United Kingdom, first released their body of knowledge in 1992 with the fifth edition being released in 2006 (Peng *et al.*, 2007:107). These PMBOKs represent the most widely used in the project management industry however Peng *et al.* (2007:111) having made a comparison of a number of PMBOKs, conclude that they are different in guidance, content and framework. They put forward the argument to integrate the various documents into a "world" PMBOK making the understanding, study and application of project management knowledge easier. Alam, Gale, Brown and Kidd (2008:231) found in their study of the available PMBOKs that there is disagreement between the documents and what industry, academia, and profession bodies and associations regard to be the important competencies, learning outcomes and knowledge sets of project management. They argue against the unification of the PMBOKs stating that debate on different perspectives is necessary and that unification may be "detrimental to a real understanding of the issues and critical thinking" (Alam *et al.*, 2008, 231). Thomas and Mengel (2008:304) contend that the tools and techniques emphasized in the standards fall short in terms of the behavioural and personal competencies required for project managers to perform in the workplace.

The PMI's PMBOK, accepted by the ANSI, IEEE and Standards Australia, is arguably the most widely used project management standard globally. There are growing numbers of project managers certified in PMI's Project Management Professional (PMP) certification, which many organisations are using as an entry requirement when recruiting project managers (Thomas & Mengel, 2008:305). Thomas and Mengel (2008:306) highlight that the PMI PMBOK is under-represented in the softer and more intuitive approaches, focusing more on the linear, rational and analytical. Belzer (2001:1) clarifies that the PMBOK is merely a guide and that the challenge is appropriate implementation of the processes, tools and techniques. Brill, Bishop and Walker (2006:130) indicate that research studies (e.g. Crawford, 2002) into project management competence suggest that the project management standards are not sufficiently comprehensive in particular in the areas such as leadership, problem solving, context knowledge, people expertise and communication skills. Pant and Baroudi (2008:125) agree stating that the coverage of soft skills in the PMBOKs appears to be "both piecemeal and inadequate…some might suggest it is tokenistic". Alam *et al.* (2008:231) stress that the PMBOK has particular gaps in the area of people and culture. Pollack (2007:268-269) finds it surprising that many project management specific approaches to human resource management have not been developed given that projects are managed by people often in highly stressful situations. He concludes that the application of project specific human resource management is elementary at best and the PMBOKs refer project managers to the extensive external human resource management literature.

The IPMA's Competence Baseline 3.0 recognises the growing demand for behavioural competencies of both project managers and project team members (IPMA, 2006:v). Of all the currently available standards, the ICB 3.0 addresses the behavioural aspects of project managers most comprehensively and thus has been used as the basis of this study.

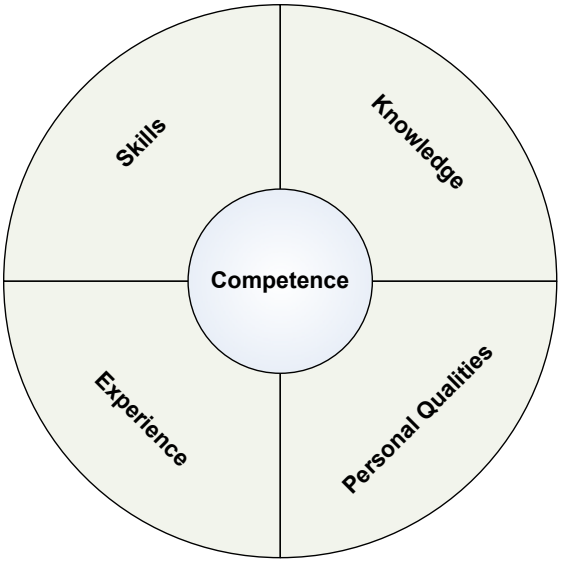
3.3 MODEL OF COMPETENCE

Competency is a widely used term often used interchangeably with competence.

Boyatzis (1982:20-23) defines a competence as "an underlying characteristic of an individual, which is causally related to effective or superior performance in a job which could be a motive, trait, skill, aspect of one's self-image or social role, or a body of knowledge

which he or she uses". Thus according to Boyatzis (1982:20-23) competence encompasses knowledge, skills, attitudes and behaviours as is shown graphically in Figure 5.

Figure 5. Composition of competencies



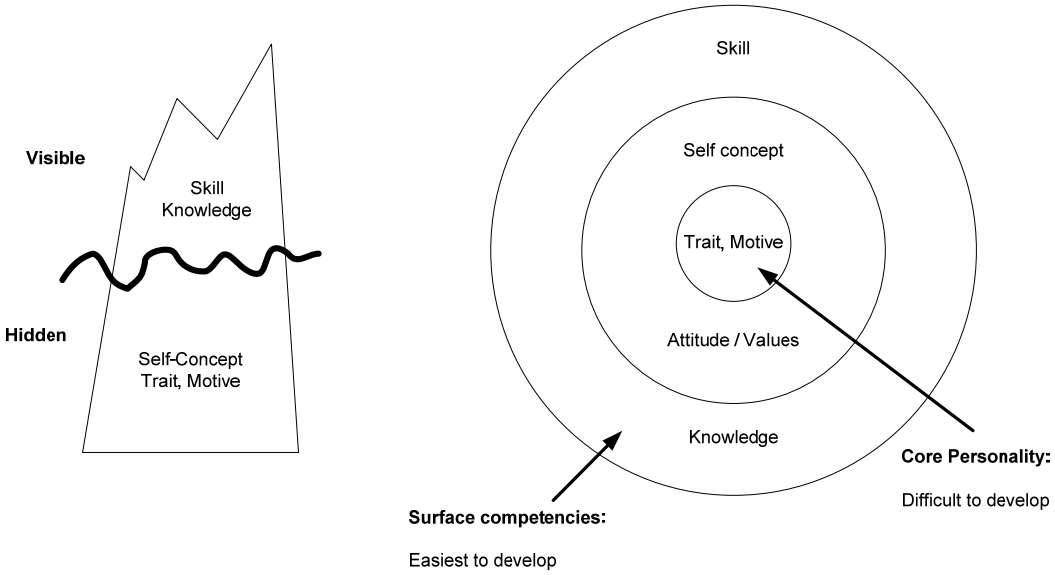
Source: Adapted from Boyatzis (1982:20-23)

Spencer and Spencer (1993:9) define competency as "an underlying characteristic of an individual that is causally related to criterion-referenced and/or superior performance in a job or situation". They contend that competence is an enduring part of personality that is deeply rooted. It can be used to predict behaviour and performance in a number of different situations. Spencer and Spencer (1993:9-11) assert that competence comprises five characteristics:

- **Motives** – which drive, direct and select behaviour towards goals.
- **Traits** – which are physical characteristics and consistent responses to information or situations.
- **Self-concept** – the person's self-image, attitudes or values.
- **Knowledge** – the information the person possesses.
- **Skills** – which is the ability to perform a (physical or mental) task.

Spencer and Spencer (1993:9-11) highlight that people's knowledge and skills competence are easy to develop as they more visible, surface characteristics. The less visible trait and motive competence are more central to personality, difficult to assess and develop, and ultimately an organisation should rather select for these competencies than to train (Spencer & Spencer, 1993:10-11). Attitudes and values can be changed with personality development experiences but are quite difficult and time consuming. See Figure 6 (Spencer & Spencer, 1993:11).

Figure 6. Competency structure



Source: Spencer and Spencer (1993:11)

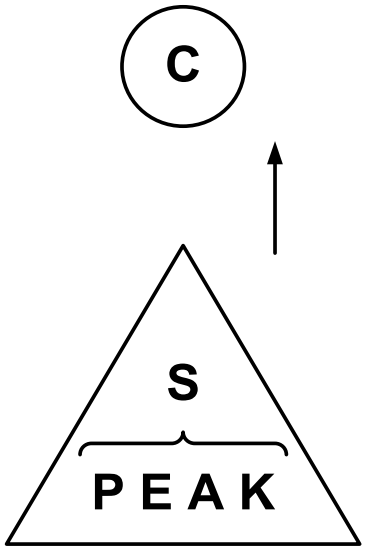
Murray-Webster and Hillson (2002:3) propose a framework similar to Spencer and Spencer for the purposes of assessing project management competence. PEAKS is a framework model comprising five core elements of competency: **P**ersonal **C**haracteristics, **E**xperience, **A**ttitudes, **K**nowledge, and **S**kills.

- **P**ersonal characteristics are natural preferences and traits. "Who am I?"
- **E**xperience is acquired by practising project management. "What have I done?"
- **A**ttitudes are chosen responses to situations. "How shall I respond?"
- **K**nowledge is learned – either by the traditional means (e.g. theoretical training) or gained on the job. "What do I know?"
- **S**kills are learned but must be learned experientially.

Source: Adapted from Murray-Webster and Hillson (2002:3)

Personal characteristics, experience, attitudes and knowledge form the foundation. When applied with skill they produce the appropriate behaviours associated with competence. This relationship is shown diagrammatically in Figure 7.

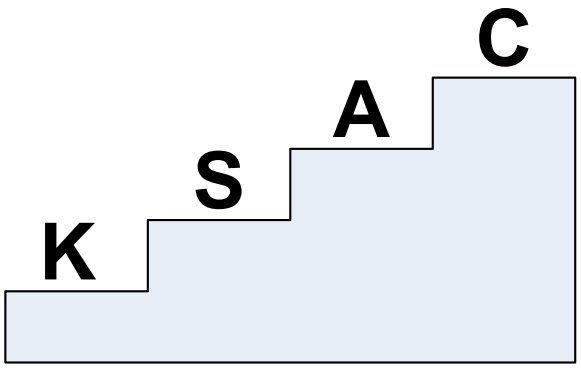
Figure 7. Relationship between PEAKS elements



Source: Murray-Webster and Hillson (2002:4)

Goff (2006:1) defines competency with respect to project management as "consistently-demonstrated and appropriately used attitudes, behavioural attributes, skills and knowledge, resulting in clear enterprise benefit". Goff proposes the concept of a competence ladder or CASK model. One starts with knowledge which when applied through experience becomes skill. If one receives rewards and recognition to reinforce the behaviour, attitudes and attributes are developed. Competence results from experience (in attitudes, skills and knowledge) correctly repeated when one is afforded the opportunity to grow – see Figure 8. Performance follows from competence.

Figure 8. Competence development ladder



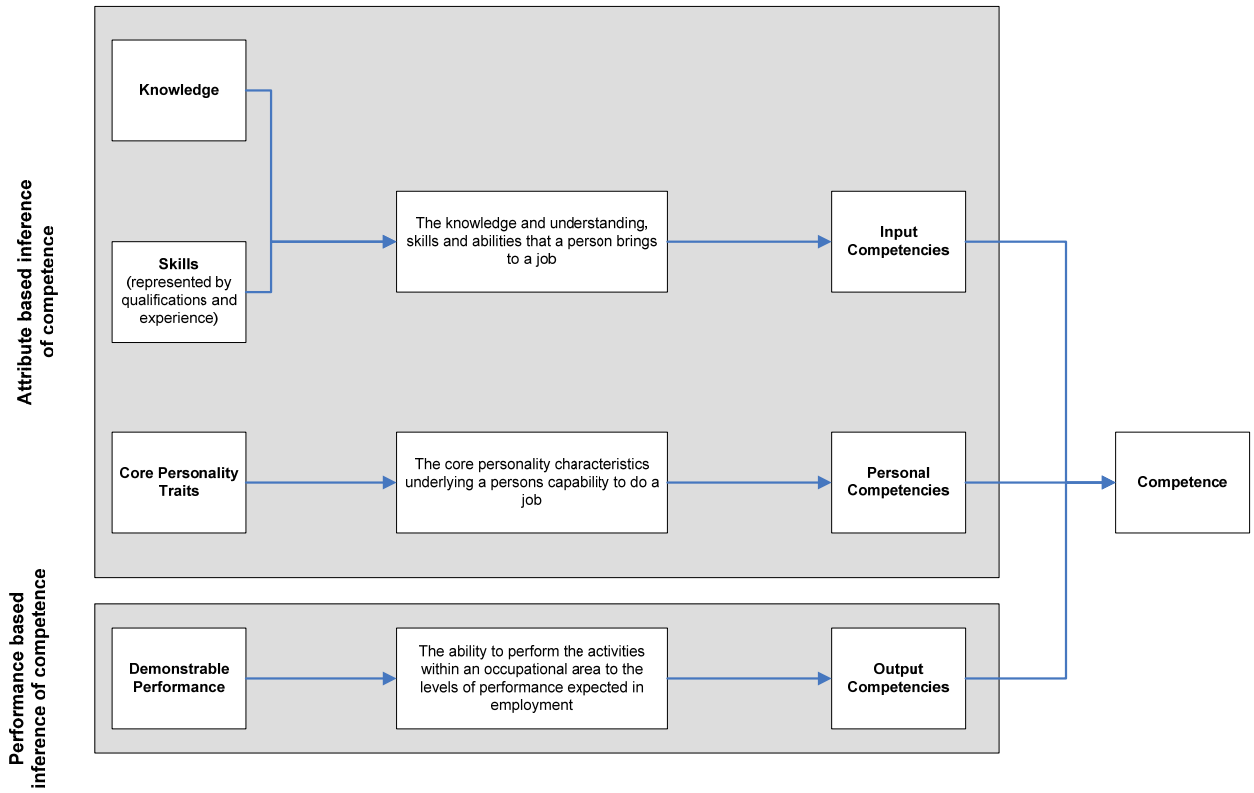
Source: Goff (2006:2)

Lecomber and Asumadu (2005:6) propose a model comprising four components of competency:

- Knowing what to do.
- Knowing how to do it.
- Possessing the desire to do it.
- Being given the opportunity to do it.

Crawford (2005:8-9) provides a framework for competence (see Figure 2) that integrates the attribute based and performance based approaches providing a basis for comparison against standards through the identification and measuring of competence aspects. Crawford's framework recognises competence as more than a single construct.

Figure 9. Integrated model of competence identifying components of the overall construct



Source: Crawford (2005:9)

Knowledge and skills are classified as input competencies and together with personal competencies they make up the attribute based components of competency. Output competencies are performance based and represent the demonstrable workplace performance applying practices in accordance with occupational, professional or organisational competency standards. Project management standards for competency address only two aspects indicated in the model, knowledge (as captured in the PMBOKs) and demonstrable performance (as captured in performance standards) (Crawford, 2005:8-9).

In the ICB 3.0, the IPMA (2006:3) defines competence as "the demonstrated ability to apply knowledge and/or skills, and, where relevant, demonstrated personal attributes". Therefore competency is:

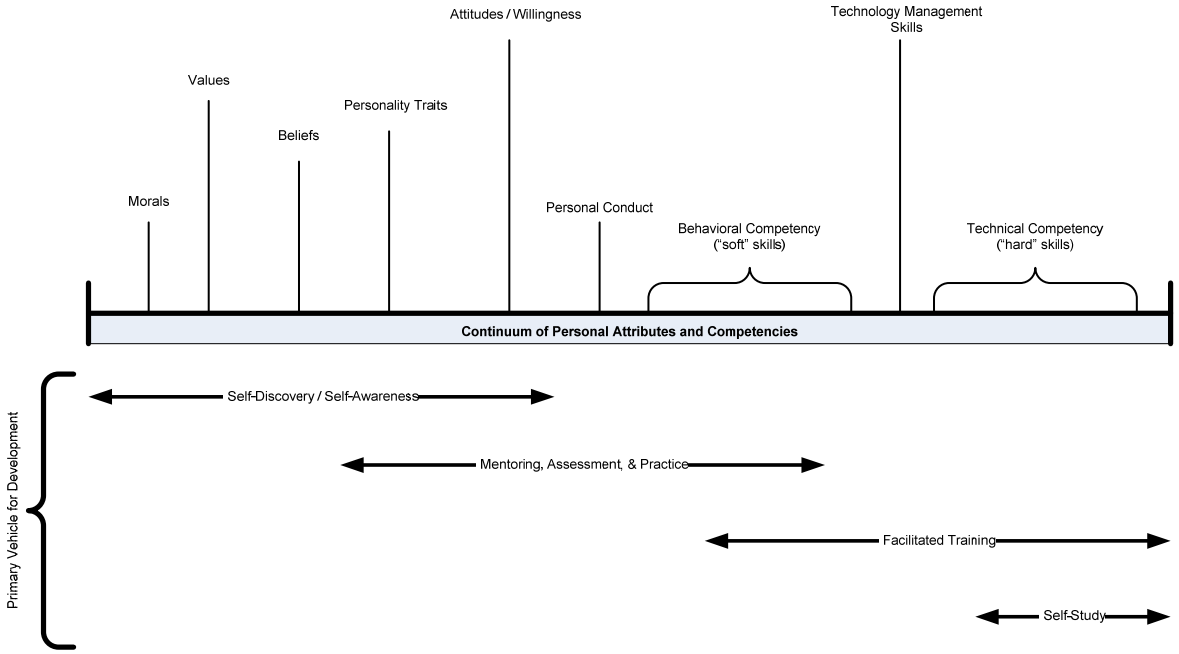
Knowledge + Experience + Personal Attitudes

Similarly, the APM (2006:xvi) indicates that a suitably balanced combination of knowledge, experience and behaviour leads to good effective project management.

This aligns with Crawford's framework model of competency and the Murray-Webster and Hillson PEAKS framework in that competency is not a single construct. Knowledge and experience relate to function while attitude relates to behaviours (Alam *et al.*, 2008:229).

Heerkens (2002:40) stresses that a project manager's hard skills, soft skills, functional competencies and personal traits are distributed along a continuum of personal attributes and competencies as shown in Figure 10.

Figure 10. Continuum of personal attributes and competencies and their development



Source: Heerkens (2002:40)

Thus a project manager's capability comprises a combination of skills, competencies and personal traits unique to each person. Goff (2008:1) refers to this capability as talent: "the right combination of innate abilities, plus the knowledge, skills, attitudes, experience and competence to deliver performance for a specific situation". Skills, being more mechanistic can be developed through self-study or facilitated training. This approach applies mostly to hard skills. As you move leftward on the continuum, coaching and mentoring become more

applicable for development of softer skills. The traits that underlie one's personality are found are the extreme left. These traits, such as one's belief system and moral values, affect behaviour and conduct at a fundamental level. Here development requires introspection and is very personal. (Heerkens, 2002:40). Zielinski (2005:20) supports this stating that higher-order interpersonal skills such as communication, negotiation, conflict management and persuasion are best developed though interaction and participation – the "old-fashioned" way.

The APM (2006:114) identifies eight behavioural characteristics important for project management:

- **Attitude** – an open, positive "can-do" attitude builds confidence and credibility.
- **Common sense** – the ability to identify and adopt sensible, effective straightforward solutions; to simplify.
- **Open mindedness** – openness to new ideas, practices and methods.
- **Adaptability** – a propensity to be flexible where appropriate avoiding rigid patterns of thinking or behaviour.
- **Inventiveness** – the ability to articulate innovative strategies and solutions and to identify ways of working with disparate resource and interests to achieve objectives.
- **Prudent risk taker** – a willingness and ability to identify and understand threats and opportunities.
- **Fairness** – a fair and open attitude, respecting others and their values.
- **Commitment** – a focus on the project's objectives, user satisfaction and team-working.

Based on an extensive study of the literature, Heerkens (2002:38) summarises the following traits that are observable in successful project managers:

- Honesty and integrity.
- Thinks like a generalist.
- High tolerance for ambiguity.
- High tolerance for uncertainty.
- Persuasive.
- Assertive.
- Process-oriented.

- Self-aware / reflective.
- Open and accessible.
- Politically astute.
- Decisive.

Of these desirable traits, Heerkens (2002:39) considers the most critical to be: thinks like a generalist, a high tolerance for ambiguity, a high tolerance for uncertainty and honesty and integrity.

3.4 SOFT SKILLS – THE MISSING LINK

Soft skills have become the new hard skills in project management. Pinkowska and Lent (2011:3) define soft skills in project management as "all interpersonal skills which contribute to the higher efficiency of the execution of the human factor related processes of project management". Soft skills are often referred to as strategic skills. People are the most important parts of any project – after all people manage the project, people perform the work to achieve the project outcomes and people are the stakeholders of the project. One could argue that the success or failure of a project is dependent on people. Busch (2008:1412) suggests that a project manager will consume more time dealing with people and problems than managing the project's critical path activities and monitoring project progress. Although project problems appear in all sizes, shapes, descriptions and complexities, up to 24 percent can be categorised as "people issues" (Busch, 2008:1410-1411). The APM (2006:101) contends that projects succeed or fail through the involvement of people since people are the integral part to projects and project management. The same insight was given in 1995 by Pinto and Kharbanda (1995:42) who suggested that most of the problems a project manager will encounter are more managerial or behavioural than technical. According to Zielinski (2005:1) however, not much priority is given to dealing with the unpredictable human elements a project manager is likely to run into on a project. Project managers need to be skilled at stakeholder communication, managing expectations, understanding the organisational dynamics and creating an environment in which team members can excel. Zielinski (2005:1) asserts that communication is the major project leadership area that requires attention. Quinn and Wilemon (2009:1267) concur stating that while project managers will encounter challenges of a technical nature, many are issues and concerns are interpersonal such as interpersonal conflicts, miscommunications, cultural differences, and personality differences.

Heerkens (2002:6) contends that project management comprises art and science:

- The **art** is leading the people on the project.
- The **science** is defining and coordinating the work to be done.

He asserts that a broad knowledge of human behaviour is required by the project manager but more importantly the ability to apply appropriate interpersonal skills. This is because the project manager relies on others to get things done. Bourne (2005:4) agrees, stressing that successful project managers must be able to balance the art and craft of *management* and *leadership*. Beard (2005:1) adds that, in addition to the traditional areas of scope, cost and risk management, project managers will need to be familiar with the areas of human psychology, human factors and the creation of learning organisations. Pourdehnad (2007:430) argues that a project manager cannot rely purely on the mechanistic hard methodology given the diversity of stakeholder culture, value systems and attitudes. Projects by nature are complex dynamic systems that are hard to understand making them difficult to predict and control. Fretty (2006:41) expects a new push for improving people skills after the recent significant growth in project management tools, principles and tactics. He puts forward that project managers are no longer considered as pure implementers – they need to be strong business personnel and much more dynamic to survive in today's environment. There needs to be a blend between technical and business components. Project managers must be able to deal with individuals competent in various disciplines.

Flannes (2004:2) echoes the established trend where people skills are viewed as distinct leadership competencies enabling project success. He points out however that soft skills are mostly defined in general terms without specificity regarding behaviours or skills. According to Flannes (2004:18) soft skills involve "the abilities to communicate effectively on interpersonal levels, wear different leadership hats, apply a system that identifies individual differences, motivate individuals and teams, productively manage conflict, manage and mediate personal and professional stress, and become active in on-going career management".

Belzer (2001:2) argues that the application of soft skills in project management is the "missing link". These include communication, organisational effectiveness, leadership, problem solving and decision making, team building, flexibility, creativity and trustworthiness.

Soft skills assist to define the business value, clarify the vision, agree on requirements, provide direction, build teams, resolve issues and mitigate risk. Belzer (2001:2) contends that many projects fail due to a project manager's inability to effectively use and apply such soft skills.

According to Gillard (2009:728) excellent project manager interpersonal skills or soft skills are requisites for project success with technical skills recognised as being a necessary core competence.

Bucero (2004:22) states that good project managers cultivate hard skills (plan, organise, control) in conjunction with soft skills (communicate, listen, motivate, create) when achieving project results through their people.

El-Sabaa (2001:6) found that a project manager's human skills (i.e. soft skills) have the greatest influence during project execution ahead of technical skills. It is surprising that people skills in project management have not been emphasised.

Ireland (2007:2) states that interpersonal skills are necessary for "appropriate behaviour" which requires consideration for other's feelings when driving towards a goal. Although perhaps not the most qualified in a technical sense, the project manager should almost be the most competent of the team in interpersonal skills. This is essential to motivate the team to perform at their best. According to Ireland it is common for project managers to be hired for their technical skills but fired for their lack of interpersonal skills.

In an article in PM Network magazine in 2004, Peters (2004:19) provided the following wisdom:

> *"The whole discipline and art of project management is going to be the essence of management training, operational excellence and value added…people skills…will increasingly determine an organisation's success…Teams will voluntarily come together to solve complex problems using global resources, essentially replacing the modern day corporation…project managers with a knack for people skills will be the glue…"*

Clearly project management technical skills, although critically important, are now considered baseline competencies and what differentiates good project managers from great project managers is the extent to which they are competent in the soft skills.

3.5 EMOTIONAL INTELLIGENCE IN PROJECT MANAGEMENT

The concept of "social intelligence" was described by Edward Thorndike as long ago as the 1930s (Alexander, Caldwell, Gonzalez, Harvey, Nye, Rodgers & Washer, 2010:3). More recently the first full theory of emotional intelligence was proposed in 1990 by psychologists Peter Salovey and John Mayer (Alexander *et al.*, 2010:3). The concept of emotional intelligence (EQ) was popularised after Daniel Goleman published his book "Emotional Intelligence: Why it can matter more than IQ" in 1995 (Alexander *et al.*, 2010:3).

According to Goleman (1998:317) emotional intelligence refers to "the capacity for recognizing our own feelings and those of others, for motivating ourselves, and for managing emotions well in ourselves and in our relationships". Emotional intelligence concerns the cognitive ability that facilitates interpersonal behaviour and involves traits and social skills. It is about knowing oneself and being able to adapt socially. Goleman (1998:26-27) identifies five areas in his emotional competence framework under the categories of Personal Competence and Social Competence:

- **Personal Competence** (How we manage ourselves)
    - Self-awareness – knowing one's internal states, preferences, resources and intuitions.
    - Self-regulation – managing one's internal states, impulses and resources.
    - Motivation – emotional tendencies that guide or facilitate reaching goals.
- **Social Competence** (How we handle relationships)
    - Empathy – awareness of others' feelings, needs, and concerns.
    - Social skills – adeptness of inducing desirable responses in others.

In his research into effective performance, Goleman (1998:31) found that emotional intelligence mattered twice as much when compared with intellect (IQ) and expertise. Thus according to Goleman success is a function of both IQ and EQ.

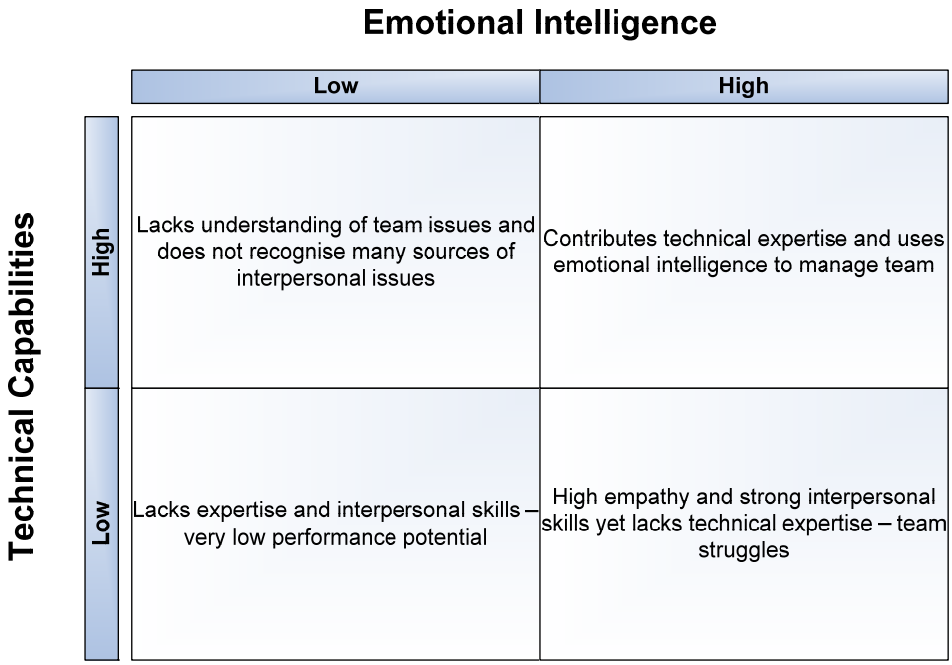
In an extension to Goleman's work, Dulewicz and Higgs (2003:224-231) contend that managerial competence comprises three types of competence: intellectual (IQ), managerial skill (MQ) and emotional (EQ):

- **Intellectual competence** (IQ) – intelligence and problem-solving abilities.
- **Managerial competence** (MQ) – knowledge and skills of management functions.
- **Emotional intelligence** (EQ) – emotional, behavioural and motivational abilities.

Their studies of leadership performance found that intellectual competence (IQ) accounts for 27 percent, managerial competence (MQ) accounts for 16 percent and emotional intelligence (EQ) accounts for 36 percent. Clearly emotional intelligence is a critical competence for leaders, which includes project managers, vital to meeting the significant challenges they face.

Project managers can be classified in various quadrants (see Figure 11) according to their technical capabilities and emotional intelligence (Quinn & Wilemon, 2009:1270). Project managers with low technical capability and low emotional intelligence at the low end have limited ability to contribute to the team in terms of procedural or practical insight. At the high end, project managers with high technical capability and high emotional intelligence, are likely to lead their teams to success. This is via their contribution of technical expertise and importantly their ability to recognise team issues, empathise with others and dealing appropriately with relationship issues in managing the team and the expectations of stakeholders.

Figure 11. The technical capability / emotional intelligence relationship for project manager performance



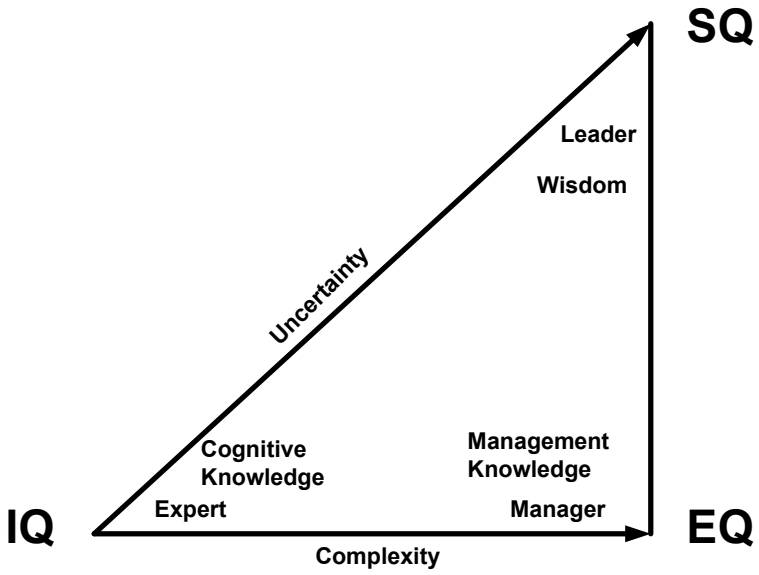
Source: Quinn and Wilemon (2009:1270)

Mengel (2005:3) mentions that while the use of IQ and EQ assists the project manager in managing relationships and expectations it fails to incorporate the human ability and need to strive for higher meaning. Throughout their lives people seek values and meaning despite being amidst uncertainty and complexity. Spiritual intelligence or SQ incorporates this search for meaning. Zohar and Marshall (2001:3) define spiritual intelligence as "the intelligence with which we address and solve problems of meaning and value, the intelligence with which we can place our actions and our lives in a wider, richer, meaning-giving context, the intelligence with which we can assess that one course of action or one life-path is more meaningful than another". Spiritual intelligence integrates all of our intelligences and Zohar and Marshall (2001:4) term it the "ultimate intelligence".

Mengel (2005:5) stresses that project managers need more than just an analytical intelligence and knowledge base to survive in a world of complexity and uncertainty. They need to be flexible and creative when responding to the "wicked" rather than "rational/analytic" problems that they will encounter in today's environment.

Thomas and Mengel (2008:309) incorporate the concepts of intelligence already discussed into a three dimensional model of project management knowledge (see Figure 12). The model shows how increasing complexity and uncertainty call for a more comprehensive inclusion of management and leadership. Projects within a controllable environment of limited complexity and low uncertainty can be managed with cognitive intelligence and expert knowledge. When dealing with increasingly complex project environments, emotional intelligence and management knowledge is required from the project manager. To be able to lead very complex projects in highly uncertain environments, project managers need to draw on their spiritual intelligence, leadership skills and wisdom. Thomas and Mengel (2008:313) refer to a project manager who has the emotional and spiritual skills and capabilities to succeed in such a complex, unknown and uncertain environment as a "master project manager".

Figure 12. Three-dimensional model of project management knowledge



Source: Adapted from Thomas and Mengel (2008:309) and Mengel (2005:6)

In a white paper exploring the role of emotional intelligence in project management in the following five years published in 2010, Alexander *et al.* (2010) suggest that the following emotional skills will be the most vital for project managers:

- **Communicating with impact** – conveying your messages to other people clearly and unmistakeably but also receiving information from others without distortion.

- **Persuasive leadership** – a leader's ability to move people from their current position to a position that they don't currently hold.
- **Conflict management** – involves positive conflict management behaviours that are integrating, compromising and obliging or negative conflict management behaviours that are dominating and avoiding.
- **Change management** – every project overtly or covertly introduces organisational changes in order to achieve a desired future state – a project manager is a change agent.
- **Adaptive personality** – a project manager must selectively employ adaptive leadership techniques to effectively lead change.

3.6 BEHAVIOURAL COMPETENCIES

Mirabile (1997:74) describes behaviour as "the observable demonstration of some competency, skill, ability or characteristic". He states that behaviour comprises a set of actions which can be observed, taught, learned and measured. Behaviour is thus a very useful definitive expression of competency (Mirabile, 1997:74).

The APM (2006:114) describes behavioural characteristics as the elements that separate and explain a person's preferred way of acting, interacting and reacting in different situations.

Goff (2006:3) posits that the behavioural attributes of a project manager are the basis for project success. A research study completed by Bedingfield and Thal (2008) supports this indicating that project manager personality is a predictor of success. Behavioural attributes reflect your personality – your essential self, and are affected by your value system. These are social competencies including thinking, behaviour and leadership styles. Behavioural attributes are very difficult to measure.

As mentioned briefly in 3.2, behavioural competencies are addressed in most PMBOKs to some extent. For the literature study the three PMBOKs considered most widely used in the industry were studied regarding behavioural competencies and soft skills, namely: the IPMA's ICB 3.0, the PMI's PMBOK and the APM's BOK.

In the ICB 3.0, the IPMA categorises project manager competencies into a technical range (20 competencies), a behavioural range (15 competencies) and a contextual range (11 competencies). The IPMA points out that these ranges are interrelated and they cannot be seen in isolation. The IPMA's Eye of Competence integrates all the elements as seen through the eyes of the project manager when evaluating and responding to a particular situation. The competence baseline is used to assess and certify professionals working on projects, and those managing programmes and portfolios of projects. In addition, the ICB 3.0 is used as a guide in the preparation of training materials, conducting research and for general information regarding applied project management. A brief description of each of the competence ranges is given below (IPMA, 2006:6,9):

- **Technical** competence elements (20) deal with the project management matter on which the professionals are working. These are the solid elements which cover project management content.
- **Behavioural** competence elements (15) deal with the personal relationships between the individuals and groups managed in projects, programmes and portfolios. This range covers attitudes and skills.
- **Contextual** competence elements (11) deal with the interaction of the project team within the context of the project and with the permanent organisation. This range covers the project manager's competence in managing relations with the line management organisation and the ability to function in a project focussed organisation.

The PMI (2008) refers to the interpersonal skills needed by project managers specifically in the chapters addressing the knowledge management areas of project human resource management (see PMI, 2008:215) and project communications management (see PMI, 2008:243). A project manager utilises interpersonal skills in human resource management to develop and manage the project team. Interpersonal skills are utilised in project communications management to manage the expectations of stakeholders. Eight key interpersonal skills underlying project management are described briefly at quite a high level in an appendix (see PMI, 2008:417). Generally speaking, the PMI classifies interpersonal skills as part of the tools and techniques leveraged by project manages to achieve project outcomes.

The APM BOK identifies 52 knowledge areas for project management clustered into the following seven sections: project management in context, planning the strategy, executing the strategy, techniques, business and commercial, organisation and governance and finally people and the profession (APM, 2006). Project management soft skills and behaviours are mainly addressed in the section on people and the profession. The APM BOK warns against using any of the sections in isolation and that the knowledge topics are always interrelated and project managers need to integrate according to the situation presented (APM, 2006:ix). As such a body of knowledge intends to provide guiding principles only, not fixed rules and practices.

A comparison of behavioural (or personal) competencies from the respective standards is summarised in Table 1.

Table 1. Comparison of behavioural competencies from respective standards

IPMA ICB 3.0 (2006) **Behavioural Competencies (15)**	**PMI PMBOK (2008)** **Interpersonal Skills (8)**	**APM BOK (2006)** **People & the Profession (9)**
Leadership	**Leadership**	Communication
Engagement & motivation	Team building	Teamwork
Self-control	Motivation	**Leadership**
Assertiveness	Communication	Conflict management
Relaxation	Influencing	**Negotiation**
Openness	Decision making	Human resource management
Creativity	Political & cultural awareness	Behavioural characteristics
Results orientation	**Negotiation**	Learning & development
Efficiency		Professionalism & ethics
Consultation		
Negotiation		
Conflict & crisis		
Reliability		
Values appreciation		
Ethics		

Source: Adapted from IPMA (2006), PMI (2008) & APM (2006)

The 15 behavioural competencies addressed in the IPMA ICB 3.0 compare very favourably with the 25 competencies described by Goleman (1998) in his emotional competence framework. See Table 1 in Goleman (1998:26-27). It is interesting to note that the IPMA do not see communication as a behavioural competence, categorising it under technical competencies.

3.7 IPMA BEHAVIOURAL COMPETENCIES

Each of the 15 behavioural competencies from the IPMA ICB 3.0 are discussed below with support from the literature.

3.7.1 LEADERSHIP

In the project environment where change and uncertainty is a given, strong leadership by the project manager is essential. Leadership is creating the vision and direction for the project. It requires influencing the project team to be aligned towards a common purpose. It is about inspiring people, empowering them to achieve success. Within the project team leadership can come from team members, each with expertise in their functional area. This is shared leadership. A leader inspires trust, confidence and commitment. The project manager as leader protects his team and the interests of the project.

According to Petty (2009:7) most times projects fail it is due to people-related issues and in particular because the project manager failed as a leader.

According to the IPMA (2006:86) leadership is a vital competence for any project manager throughout the project. In fulfilling the project objectives the project manager must provide direction and motivate others in their role. Leadership is essential when a project is faced with problems, when there is change or when there is uncertainty. Importantly, leadership is the mechanism for the project manager to apply all of his competences to the project and the team. The project manager must not only be considered a leader by the project team but also by senior management and other interested parties when representing the project. To be a competent leader the project manager must be knowledgeable in the various leadership styles and be able to apply them proficiently according to the situation and context (IPMA, 2006:86). Such situational leadership comprises patterns of behaviour, methods of communication, attitude regarding conflicts and criticisms, ways of controlling the behaviours of team members, taking decisions, and delegating (IPMA, 2006:86).

One cannot become an effective leader simply by attending a training course or reading a book. Leadership is learned experientially by trial and error although books and training courses do provide a good basis. Leadership requires self-confidence, courage and

persistence; these personal traits are developed through a process of self-discovery (Bisoux, 2005:42). Leadership requires practise!

According to Flannes (2004:6) a project manager needs to adapt his leadership style as the project progresses through the stages of execution. His leadership style is also dependent on the abilities and sophistication of the people in his team. An effective project manager is able to apply one or more leadership roles as demanded by the situation. Four distinct leadership roles are applicable when managing a project (Flannes, 2004:6-7):

- **Leader role** – getting the team to understand the vision; what needs to be done and why. Requires displaying a personal passion and excitement for the project's vision but also the psychological capability to process anger and disappointment preventing such feelings from creating cynicism with regard to the vision.
- **Manager role** – establishment of the project administrative infrastructure and the monitoring of quality, costs and schedule. Requires comfort with structure, monitoring, and tracking but in addition resilience, the ability to comfortably confront others and to accept not pleasing everyone in the team.
- **Facilitator role** – obtaining the resources needed by the team to complete project tasks and solve problems. Requires persistent assertiveness even in the face of conflict.
- **Mentoring role** – provision of developmental assistance to the project team members usually via subtle guiding, teaching, encouraging, and developing of team members. Requires the ability and comfort to given to others on an interpersonal level within a developmental framework.

Dulewicz and Higgs (2003:1) indicate that exercising leadership relies to a large degree on the personality of the leader. Based on an extensive review of the literature, they identify three leadership profiles goal oriented, involving and engaging which are appropriate depending on the level of change to be achieved in the organisation (Dulewicz & Higgs 2003:5):

- **Engaging Leadership** – style based on a high level of empowerment and involvement in a highly transformational context. Useful to effect radical change through engagement and commitment.

- **Involving Leadership** – style based on a transitional organisation that faces significant but not radical change.
- **Goal-oriented Leadership** – style based on delivering clearly defined results within a stable context.

Similarly in the project environment, project managers need to utilise a leadership style or a combination of styles as is appropriate not only to the project but also according to the project team and context.

Dulewicz and Higgs (2005:115) suggest 15 leadership dimensions which can be clustered under the competencies intellectual (IQ), emotional (EQ) and managerial (MQ). These are summarised in Table 2 where high, medium and low refers to the extent that the competency needs to be applied.

Table 2. Fifteen leadership competencies and three styles of leadership

Group	Competency	Goal-oriented	Involving	Engaging
Intellectual (IQ) (3 competencies)	1. Critical analysis and judgement	High	Medium	Medium
	2. Vision and imagination	High	High	Medium
	3. Strategic perspective	High	Medium	Medium
Managerial (MQ) (5 competencies)	4. Engaging communication	Medium	Medium	High
	5. Managing resources	High	Medium	Low
	6. Empowering	Low	Medium	High
	7. Developing	Medium	Medium	High
	8. Achieving	High	Medium	Medium
Emotional (EQ) (7 competencies)	9. Self-awareness	Medium	High	High
	10. Emotional resilience	High	High	High
	11. Motivation	High	High	High
	12. Sensitivity	Medium	Medium	High
	13. Influence	Medium	High	High
	14. Intuitiveness	Medium	Medium	High
	15. Conscientiousness	High	High	High

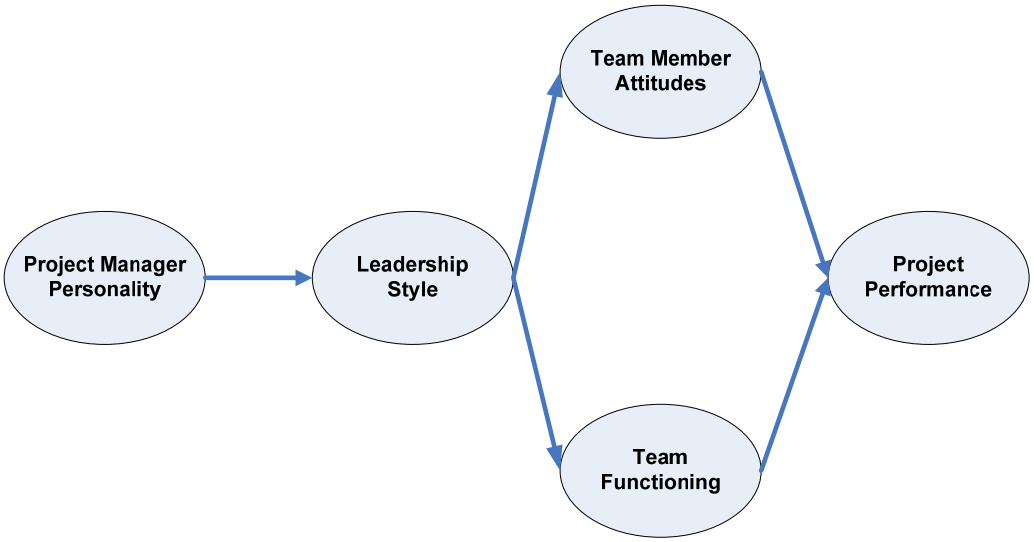
Source: Dulewicz and Higgs (2005:115)

Thus Table 2 provides insight of the competencies needed by a project manager when adopting the respective leadership styles. In a study of the leadership competency profiles of successful project managers in all types of projects, Muller and Turner (2010:444) found high expressions for the following leadership dimensions: critical analysis and judgement (IQ), influence (EQ), motivation (EQ) and conscientiousness (EQ). They conclude that the

leadership styles of successful project managers resemble the Engaging style as per Dulewicz and Higgs (2005). This is in support of the discussion above regarding the emotional intelligence required of modern project managers.

A study performed by Lin, Wei and Fei (2007:5247) found that there is a positive correlation between project manager leadership and project performance. See Figure 13.

Figure 13. How project manager leadership affects project performance



Source: Adapted from Lin *et al.* (2007:5247)

Barber and Warn (2005:1032) mention that project managers must be firelighters rather than firefighters. They need to lead proactively, focussing on outcomes by seeing the big picture, anticipating events and preventing problems. As a firelighter, the project manager evokes passion in the team, energising them and making visible the achievable project objective. To be a firelighter, Barber and Warn (2005:1032) assert requires transformational leadership by the project manager. There are times during the project that the project manager may need to be more transactional reacting to problems. Project success however will rely on the project manager's firelighting capability. The firelighter project manager is able to maintain dedication to the shared outcomes and coaches team members to achieve challenging objectives.

Much scholarly effort has been expended over the years in an attempt to establish the definitive styles of great leaders. These studies have not produced a clear-cut answer and fortunately so since individuals would endeavour to mimic such behaviour and not be themselves. People would easily see through them leading to distrust. In recent years the concept of authentic leadership has come to the fore. According to George, Sims, McLean and Mayer (2007:130) an individual does not have to be born a leader and that the journey to authentic leadership begins with understanding your life story. Many authentic leaders have overcome difficulties which have then given meaning to their life. Authentic leadership requires leaders to maintain a sense of self even under the most difficult circumstances. George *et al.* (2007:130) propose that authentic leaders do so with their hearts demonstrating a passion for their purpose whilst practising their values consistently. Thus authentic leadership requires a high degree of self-awareness. Authentic leaders are able to build extraordinary support teams. George *et al.* (2007:130) postulate that authentic leadership is the only way to create sustainable long-term results. This view is reinforced by Toor and Ofori (2008:621) who argue that authentic project managers not only manage projects well but they are good leaders of people and visionaries of the future. They contend that authentic leaders are the new breed of successful future project managers. Authentic leaders can utilise a variety of leadership styles (for example transactional, transformational, directive or participative) and still be authentic. Toor and Ofori (2008:621) suggest that authentic project managers are well suited to operate in fast changing environments where there is pressure to do more with less resources. They are aligned with George *et al.* (2007:130) by stating that authentic project leaders create a sustainable competitive advantage for any organisation. Importantly, authentic project managers are not superhuman. They do make mistakes but take full responsibility for them. They accept their weaknesses using feedback to develop. Toor and Ofori (2008:624) put forward the following characteristics of authentic project leaders:

- Confident.
- Hopeful.
- Optimistic.
- Resilient.
- Transparent.
- Moral / ethical.
- Future oriented.
- Associate building.

Similarly, Lloyd-Walker and Walker (2011:393) in their capability maturity model of authentic leadership highlight the following characteristics of authentic project managers:

- Value driven.
- Authentic.
- Aware (emotional intelligence).
- Resilient.
- Relationship-centred.
- Fair and unbiased (ethical).
- Realistic and confident.
- Positive and optimistic.
- Consistent.

Project leadership, the people-side of project management, is thus vital for the successful delivery of desired results.

3.7.2 ENGAGEMENT AND MOTIVATION

Project teams are bound by a common sense of purpose but are made up of individual members with diverse backgrounds, expectations and objectives. By appropriate leadership the project manager must build and grow the team to work effectively as interdependent individuals. Different leadership styles will be required as the team goes through Tuckman's distinct stages of forming, storming, norming and performing. In supporting the team the project manager assumes a number of roles: motivator, coach, cheerleader, peacemaker and conflict resolver (Pinto & Kharbanda, 1995:46). According to Heerkens (2002:88) the project manager needs to provide leadership both to the team and to individuals. Although similar, each has unique considerations. Fretty (2006:41) reminds us that the project manager must be able to deal effectively with individuals trained in different disciplines. The project manager needs to consider all aspects that could disrupt team harmony including geographic, cultural and knowledge barriers (APM, 2006:104). According to the APM (2006:105) a positive and effective team is one that encourages involvement, flexibility, efficiency, innovation and productivity to achieve project success. The PMI (2008:418) submits that an effective team is one that has mutual trust, high quality of information exchange, better decision making and effective project control. Over time the project team

accumulates shared experiences, language and culture enabling a supportive and collaborative environment which if nurtured may lead to high performance (APM, 2006:104). Successful project managers not only develop and grow their teams but promote positive social exchanges by building strong relationships with and between team members (Lloyd-Walker & Walker, 20011:386). Sense and Fernando (2010:504) suggest that projects have a spiritual identity and that project participants "develop a deep connection with the project, its purpose and with others, and become inspired into action". They argue that projects provide a challenging site for self-growth, projects promote connectedness and that projects provide a sense of worthiness to team members.

A project manager achieves engagement when he has the personal buy-in from the project team and stakeholders (IPMA, 2006:90). When engaged, people not only believe in the project, but they want to be a part of it. As the point of departure the project manager must be engaged with the project. Engagement is necessary to energise people behind a common goal in bringing the project vision to life (IPMA, 2006:90).

In creating a motivational climate within the project team, the project manager needs to be familiar with each team member. The project manager must be aware of each person's experience, their set of skills, their personal attitudes and circumstances, and most importantly what motivates them intrinsically (IPMA, 2006:90). To bring the team together and get the best performance, the project manager needs to draw on strong interpersonal skills (Ireland, 2007:2).

If engagement and motivation of the project team is achieved the result is good working relationships and increased productivity at the individual and team levels (IPMA, 2006:90). This process must be carried out with authenticity or else the team will soon see through the deception and disengage (IPMA, 2006:90). When operating in a matrix reporting structure, engagement and motivation of the team is critical since the project manager has no formal authority over team members. He needs to rely on his tact and influencing ability.

Each person in project team shares the responsibility to liberate energy in the group. Veil and Turner (2002:137) warn of energy loss that can drain the socio-emotional creativity of project managers and their teams. They cluster causes of energy loss into four groups that must be managed by the project manager (Veil & Turner 2002:137):

- Energy loss through killing ideas.
- Energy loss through the project group being pushed to the limit.
- Energy loss through the static perception of team roles.
- Energy loss through power play.

Thamhain (2004:538) found that the project environment has an influence on team performance. Of significance were factors that contributed to fulfil professional esteem (Thamhain 2004:538):

- Professionally stimulating and challenging work environments.
- Opportunity for accomplishment and recognition.
- The ability to resolve conflict and problems.
- Clearly defined organisational objectives relevant to the project.
- Job skills and expertise of the team members appropriate for the project work.

Similarly, Dwivedula and Bredillet (2010:164) found that in the project context the following significantly explain work motivation:

- Initiatives directed towards empowering the individual.
- Providing a motivating work environment.
- Challenging and interesting nature of work.
- Formal and informal communication.
- Job security.

Project managers must ensure that they control the project environment as far as possible addressing these factors to stimulate motivation levels and thus team performance.

Pinto and Kharbanda (1995:46) assert that the healthier the team atmosphere the greater the likelihood that the team will perform effectively. According to the PMI (2008:418), the overall success of any project depends on the extent of the project team's commitment which in turn is directly related to their level of motivation. Research performed by Yang, Huang and Wu (2011) supports this. They found that teamwork is positively related to project performance. Pinto and Kharbanda (1995:46) capture the role of the project manager opposite the team succinctly: "the project manager's job is to do whatever is necessary to build and maintain the health (cohesion) of the team".

3.7.3 SELF-CONTROL

Self-control or self-management is basically one's approach to coping with life (IPMA, 2006:92). Self-control is called for when dealing with stressful situations or changing requirements for example. The project manager needs to set the example in the project team and remain controlled in the most testing of situations. It is important that the project manager be constantly aware of stress levels within the team such that he can pre-empt situations where individuals are likely to lose control and take appropriate action. When dealing with individuals who have lost self-control the project manager must ensure that he retains his own self-control. By effective management of resources the competent project manager is able to maintain a healthy balance between work, family and leisure time for the entire project team (IPMA, 2006:92). This balance assists in managing stress levels (IPMA, 2006:92).

Ireland (2007:2) contends that self-control is one of the behavioural traits most essential to leadership. A project manager with self-control behaves appropriately. In their empirical research Bedingfield and Thal (2008:1307) found that the emotional stability of the project manager is a predictor of project success. They describe emotional stability as being calm, even-tempered and relaxed in spite of stressful situations without becoming angered and losing control. Barry (2010:2) provides that leaders with a tenacious attitude take problems in their stride. When faced with a stressful event, a leader sees it as an opportunity where they can influence the outcome.

According to Zielinski (2005:22) projects are inherently stressful environments. The work and stress does not abate. Project managers thus must be able to manage stress levels; for their teams and for themselves. Flannes (2004:14-15) highlights that studies into stress have shown that individuals suffer temporary decreases in intellectual and cognitive functioning when exposed to prolonged periods of stress. While many are aware of the obvious ways to manage stress, doing so is often difficult. In most organisations the project manager is left to manage stress on his own. George *et al.* (2007:130) reinforce this view that leading is high-stress work. Due to the uncertainties in the project environment, there is no way to avoid stress. It is more a question of how one can control it to maintain a sense of equilibrium.

3.7.4 ASSERTIVENESS

The IPMA (2006:94) defines assertiveness as the ability to state your views persuasively and authoritatively. Assertiveness is critical to the project manager throughout the life of the project. The project manager needs to protect the interests of the project which requires interfacing with stakeholders especially when recommending courses of action and taking decisions (IPMA, 2006:94). The project manager cannot allow himself to be misled or manipulated. Often the project manager needs to persuade others either to undertake a course of action in the interest of the project or to get agreement in the implementation of worthy ideas of benefit to achieving project objectives (IPMA, 2006:94). Persuasiveness is the ability to attain consensus through debate or argument (IPMA, 2006:94).

Racine (2008:101) contends that project managers are in the business of influencing. They orchestrate by influencing others to achieve project outcomes. He suggests that influencing distils down to directing people, persuading them or negotiating with them. The project manager needs to apply all three techniques during project execution depending on the situation. Directing people relies on positional authority however most times a project manager does not enjoy positional authority and must look to persuasion or negotiation. Racine (2008:101) points out that persuasion is to a large extent a monologue whilst negotiation requires dialogue.

McKay (2008:2) states that politics will surface whenever two or more people work together. In project management there will always be politics to some degree. Politics requires understanding multiple agendas and meeting them to be successful. The project team, their management and the client have needs that are different. It is up to the project manager to successfully manage and leverage politics in achieving project outcomes. Pinto (1995:42) regards the understanding of the organisational politics to be absolutely essential to the project manager, whether to obtain extra resources or simply to grease the wheels of the project machine. Thomas and Mengel (2008:308) reiterate the importance of a project manager's skills in organisational politics for project success. They indicate that political savvy project managers are able to freely move across a variety of boundaries in the organisation to achieve the outcomes required for project success.

3.7.5 RELAXATION

Relaxation is the ability to de-escalate tension in difficult situations to maintain cooperation between the parties involved (IPMA, 2006:96). Stressful situations often arise as differences or irritations between individuals which can easily threaten the project outcomes. A skilful project manager is proactive, anticipating such situations and taking action to minimise their impact on the project (IPMA, 2006:96). The project manager needs to be able to re-energise himself and the team after stressful events or situations which are inevitable in projects (IPMA, 2006:96). Relaxation and re-energising may be realised by team building and social events for the whole team (IPMA, 2006:96).

3.7.6 OPENNESS

Project managers need the ability to make team members feel comfortable to express themselves. Openness in the project team has the benefit of valuable input from individuals. Importantly the project manager should create the climate where issues, concerns and suggestions may be tabled and addressed in an environment of mutual respect, trust and reliability (IPMA, 2006:98). Since project team members provide professional expertise that often the project manager does not have, a climate of openness allows the project manager to leverage the knowledge and experience of others (IPMA, 2006:98). Openness requires that the project manager be sensitive to issues of diversity. Diversity must be embraced; it is unacceptable to discriminate on the grounds of age, gender, sexual orientation, religion, cultural differences or disability (IPMA, 2006:98).

Busch (2008:1421) indicates project managers must learn patience and the ability to defer judgement while learning about a project problem. This requires that the project manager listen without interruption or attempting to solve the problem. Once the problem has been defined and understood should the project manager proceed to engage with questions, alternatives and recommendations. According to Bucero (2004:22) it is key that project managers solicit input, feedback and opinions from the project team; doing so helps define reality more completely.

From their study of the literature, Bedingfield and Thal (2008:1306) conclude that openness relates to an individual's mental and experiential life in terms of breadth, depth, originality, and complexity. Openness refers to aspects such as independence of judgement,

intellectual curiosity and active imagination. In their research, Bedingfield and Thal (2008) found that openness is a positive predictor of successful project managers.

Pinto and Kharbanda (1995:46) stress that a project manager cannot possess all the information, knowledge or expertise necessary in executing the project. A project manager, acting as facilitator, needs to know where to seek help and how to ask the correct questions. The project manager needs to encourage team members to provide input after considering all the angles and options. Flannes (2004:3) and Bisoux (2005:44) agree recommending that asking open-ended questions and actively listening is very powerful to obtain input from the team. Great leaders do their best when they stop talking and start listening.

Modern project managers are not only required to be emotionally intelligent, but they must do so across cultures (Bowles, 2011:60). As a starting point, the project manager must have an understanding of the cultural backgrounds of team members. This entails a study of the typical gestures, personality traits and emotional tendencies of the respective culture. Ballow (2004:1) summarises culture as consisting of patterned ways of thinking, feeling and reacting acquired over time and usually deeply rooted in tradition. Bowles (2011:60) says that it is important for the project manager to encourage all team members to learn about the idiosyncrasies of their peer's cultures. Cultural sensitivity is essential to get team members to feel comfortable and open up. Ballow (2004:1) asserts that the ingrained and systematic cultural behaviour patterns can be so subtle that they jeopardise meaningful communications.

Jiang and Pretorius (2010:2455) suggest that the ability to control and mitigate the negative effects of cultural differences is becoming increasingly important for project managers. This is because projects are more and more being executed in the global arena with resources drawn from the global village. In addition, project managers are challenged with bridging the communication gap across cultures.

Dzenowagis (2010:4) contends that project managers need to have cultural intelligence (CQ). She regards CQ as a strategic capability and a source or competitive advantage both for individuals and organisations. Cultural intelligence refers to the ability to function effectively across national, ethnic and organisational cultures (Dzenowagis, 2010:1). CQ helps project managers to communicate at a deeper level assisting with creating inspiration, influencing and even innovation.

Cultural differences, if ignored can have serious implications for project outcomes. Hongmin (2009:172) calls for more integration of cultural aspects and competencies into the project management BOKs and standards. He mentions that they are seriously lacking in intercultural aspects that typically would be encountered on most modern projects.

When working towards unifying culturally diverse project teams, the project manager needs to focus on and emphasise the common values and goals rather than the differences (Asgary & Thamhain, 2008:1349).

In summary, project managers need to embrace diversity, being highly receptive to new ideas and team members who are different.

3.7.7 CREATIVITY

The project manager needs to take advantage of creativity to the benefit of the project. Creativity, the ability to think and act in original, imaginative ways, comes from individual team members, the team itself and from the organisation (IPMA, 2006:100). The project manager fosters team processes to stimulate and act on creative ideas generated in the team (IPMA, 2006:100). Before ideas gain acceptance they must first be sold to the team by the originator. Creativity assists the project manager overcome problems and is a prime competence for project success. The project manager must be able to facilitate using a creative approach to solve problems when appropriate (IPMA, 2006:100). This involves looking at the issue from different perspectives, combining tools, knowledge, common sense, intuition and experience and then applying them (IPMA, 2006:100). Care should be exerted by the project manager that use of creative problem solving does not divert from the project focus (IPMA, 2006:100).

An important aspect of creativity is using the right side of the brain. Bucero (2004:22) notes that most project management training does not develop right-brain features. Creativity links in project management as “art” as well as science. It is recommended that project managers look for creative ways to manage the project especially in brainstorming possibilities, problem solving and leading the team.

Optimism is another aspect required for creativity. In their exploratory research, Dolfi and Andrews (2007:681) found that optimism in project managers is an important attribute. They suggest that optimism can be learned as their results show that project managers with more experience are generally more optimistic even in unfavourable work environments.

3.7.8 RESULTS ORIENTATION

The project manager must ensure that the project results satisfy all stakeholders by focusing the attention of the team on key objectives (IPMA, 2006:104). Results include project results, customer results, people results and results applicable to interested parties (IPMA, 2006:104). In achieving results the project manager must not lose sight of any ethical, legal or environmental issues that might affect the project (IPMA, 2006:104). The project manager is paid to achieve results; this is therefore an extremely important competence of all project managers. To achieve the results desired by respective stakeholders, it is important that the project manager understand exactly what is expected by each stakeholder (IPMA, 2006:104). The project manager has to skilfully manage deployment of the available resources. Outcomes are rewarded not effort (IPMA, 2006:104).

In delivering outcomes, the project manager must create an environment that supports learning and development leading to the continual improvement of competencies in the organisation (APM, 2006:116). Such development creates capacity in the organisation to undertake current and future projects.

3.7.9 EFFICIENCY

Efficiency is the ability to manage time and resources in an effective manner in achieving the promised project outcomes (IPMA, 2006:108). As such efficiency is a basic component of project management embracing methods, systems and procedures as effectively as possible (IPMA, 2006:108). Efficiency must be integral to the competencies of the project manager and he must be able to make it part of the culture of the team (IPMA, 2006:108). It is advantageous if efficiency is part of the organisation's culture however it can be improved by training and coaching (IPMA, 2006:108).

Project managers need to use the precious commodity of time efficiently. In the words of Pinto and Kharbanda (1995:47) – "use time carefully or it will use you". Entertaining "time

killers" will soon put the entire project team under pressure. It is all above proactively planning activities and in some instances learning to say "no".

The APM (2006:116) stresses that everyone working on the project is responsible to create knowledge. Importantly, any knowledge created must be formalised in the organisation as far as possible. Put differently, knowledge must be shared to be able to realise future benefits. Share knowledge helps prevent relearning lessons already learnt on previous projects; a learning organisation is needed. Capturing and transfer of tacit knowledge is the most difficult but can be achieved by coaching, mentoring and job shadowing for example. Mathur, Jugdev and Fung (2007:471) conclude that it is such intangible assets generated within a project that contribute as a source of competitive advantage for an organisation. Project managers are ethically obligated to build on the project management body of knowledge regarding best practices and standards.

3.7.10 CONSULTATION

Consultation involves the exchange of opinions and the IPMA (2006:110) defines consultation as "the competence to reason, to present solid arguments, to listen to the other point of view, to negotiate and to find solutions". By consulting the project manager is able to highlight differences of opinion, deal with them, and ultimately take decisions that are mutually accepted by stakeholders concerned (IPMA, 2006:110). Consultation allows respective parties to challenge each other's opinions and perceptions in an appropriate, respectful manner (IPMA, 2006:110). By careful consultation a project manager is in a better position to manage expectations of stakeholders leading to more predictable and manageable results (IPMA, 2006:110).

Bucero (2004:22) suggests that by listening to people to obtain different opinions, input and receiving feedback, the project manager not only gains commitment but an element of freedom. It is less likely that stakeholders will resist a process or a decision if the project manager has their commitment.

3.7.11 NEGOTIATION

Negotiation is the means used by the project manager to avoid real conflicts that could arise from disagreements concerned with the project by arriving at a solution that satisfies all affected parties (IPMA, 2006:112). Having regard for each party's position and interests, the project manager should conduct negotiations seeking win-win solutions (IPMA, 2006:112). Project managers are expected to be capable negotiators even in highly political or commercial settings (IPMA, 2006:112). In establishing and maintaining good relations during the negotiation process, project managers must have the ability to reach a compromise without jeopardising the project (IPMA, 2006:112). It is essential that good working relationships are maintained with all project stakeholders (IPMA, 2006:112).

According to the APM (2006:110), negotiation is "a search for agreement, seeking acceptance, consensus and alignment of views". Negotiation can take place informally (e.g. with stakeholders) or formally (e.g. procurement) during the project life cycle. The project manager must be able to decide on the appropriate strategy for negotiation – from adversarial through alliances to partnering. In the interest of preserving relationships during the negotiation process, the project manager needs to be mindful of both fairness and ethics. Negotiation requires that a project manager understand the underlying motivation, needs and wants of parties involved.

3.7.12 CONFLICT AND CRISIS

The project manager is expected to attend to the multitude of conflicts and crises that can arise on a project (IPMA, 2006:114-115). Conflicts and crises arise despite processes and guidelines put in place to prevent them. They occur at all levels between different individuals and involved parties, each having their own expectations and agendas. Project managers need to gain agreement up-front in the project how conflict and crises will be addressed (IPMA, 2006:114-115). Conflicts left unmanaged quickly affect project objectives as destructive elements go to work. Pinto and Kharbanda (1995:44) agree stating that one of the worst mistakes a project manager can make is to suppress the conflict. Left unaddressed conflict will fester, erupting later with stronger effects than if it was handled earlier.

Conflict often arises from people, who do not know each other well enough, working together under pressure on the project. Conflict originates from incompatible personalities or opposing interests between two or more individuals and/or parties. Pinto and Kharbanda (1995:44) assert that interpersonal tensions are to be expected when individuals with diverse backgrounds are put together in a project team. It is part of the forming, norming, storming and performance process of team development. Project objectives are quickly threatened when the good working environment is eroded with negativity. The project manager needs to lead with transparency and integrity, assisting to resolve the conflict by finding amicable solutions. When acting as a dispassionate intermediary, the project manager must be seen as seeking solutions; not choosing sides. Project managers can use collaboration, compromise, prevention or use or power as tools to resolve conflicts. It is key that the conflict-handling approach selected is not a knee-jerk reaction to suppress the conflict; rather it should be based on the nature of the conflict situation. Often the knee-jerk reaction arises when project managers panic at the onset of the conflict (Pinto & Kharbanda, 1995:44). Addressing facts objectively is the easy part of conflict management; however a project manager must treat feelings and emotions with sensitivity and empathy. Busch (2008:1421) captures the approach nicely: “hard on the problem, and soft on the people”. Hudson, Grishom, Srinivasan and Mousa (2005:3) state that the project manager must manage conflict in a constructive way that brings people closer together. If conflicts cannot be resolved at project level, the project manager must escalate them to a higher level of management which often requires the appointment of a non-partisan individual to arbitrate or mediate. Importantly, the project manager must communicate the outcome of the conflict resolution process to all relevant stakeholders, irrespective of the methodology used to resolve.

A crisis has a more acute effect on the project thus requiring immediate and urgent attention from the project manager. The project manager needs to leverage the knowledge, judgement and experience of the team to assess the crisis and propose scenarios for resolution of the crisis. Project outcomes need to be secured. The project manager must demonstrate leadership in communicating the nature of the crisis to stakeholders as appropriate and where necessary to escalate the issue higher in the organisation.

Dealing with conflict and crisis is an art requiring assessment, information seeking and skilful decision making given the identified risks. The project manager needs to exercise balance judgement, remaining calm often when others are angry or in panic mode, and importantly

coordinate the team in seeking solutions. According to Flannes (2004:12) people in most cultures find dealing with conflict a source of anxiety. He contends that managing conflict is not an easy skill to learn and many project managers say that conflict resolution is the toughest of the soft skills to master.

Conflict can also be positive allowing positive working relationships to evolve (APM, 2006: 108-109). This occurs by raising viewpoints into the open to clear up misunderstandings and uncertainty (APM, 2006: 108-109). Rather, it is unresolved conflict which is dangerous. If not addressed, uncertainty remains damaging morale (APM, 2006: 108-109). Hudson *et al.* (2005:3-4) agree pointing out that conflict in some instances encourages the exploration of ideas and creativity. The project manager must be able to recognise the difference between positive conflict and deleterious conflict and have the capability to manage it.

Geraldi, Lee-Kelley and Kutsch (2010:556) assert that projects are invariably confronted with unexpected events despite the best risk management processes. Unexpected events happen and project managers should acknowledge, accept and be prepared to respond appropriately. The crux of any successful response to unexpected events lies with people assets. Project managers need to call upon their competence in stakeholder engagement, negotiation and leadership when dealing with such events. Unexpected events put the project manager under significant pressure and stress which must be managed. Geraldi *et al.* (2010:556) found that successful responses to unexpected events are built on the three pillars of responsive and functioning structures, good interpersonal relationships, and importantly, competent people.

3.7.13 RELIABILITY

In projects, reliability means delivery of project outcomes according to the time, quality and costs agreed as part of the project specifications (IPMA, 2006:118). Being reliable builds trust. Reliability is a characteristic of project managers that is highly valued (IPMA, 2006:118). A reliable project manager motivates all the people and groups involved with the project encouraging self-control and self-confidence (IPMA, 2006:118).

Kloppenborg and Petrick (1999:12) warn that project managers and their teams cannot allow substandard performance. It is very undesirable to have a reputation of weak team character. Such dysfunctional behaviour includes substandard performance, insensitivity to

project problems, defensive shirking of responsibility, not completing tasks on time, people arriving late and leaving early and the gradual erosion of team collaboration. Project managers must build a reputation of solid performance and delivery of project outcomes.

3.7.14 VALUES APPRECIATION

With mutual respect as the central basis, values appreciation involves perceiving the intrinsic qualities of people and seeking to understand their point of view (IPMA, 2006:120). It encompasses the ability to communicate with people (IPMA, 2006:120). Values appreciation is essential to a project manager during project execution. He needs to understand and appreciate the different opinions, value judgements and ethical standards of all involved with the project, not only the project team (IPMA, 2006:120). In addition, project managers need a good understanding of the organisational and society wide values (IPMA, 2006:120).

Lloyd-Walker and Walker (2011:392) assert that trust, shared values and effective commitment form a strong basis for authentic leadership. Shared values also include those agreed values and behaviours for the project team.

3.7.15 ETHICS

Ethics relates to the morally accepted conduct of individuals forming the basis of all social systems allowing a certain degree of freedom but with limits (IPMA, 2006:122). Individual differences in ethics can arise from social or cultural differences (IPMA, 2006:122). Project managers must comply with legal regulations and requirements at all times. Furthermore, project managers should conduct themselves in accordance with accepted professional codes of conduct. If cases of moral conflict arise, the project manager must be capable of dealing with them appropriately (IPMA, 2006:122). Project managers should not allow themselves to be pressured to act unethically (IPMA, 2006:122).

Helgadottir (2008:743) criticises that the ethical dimension of project management has not received much attention. Although ethics is a highly philosophical and complex discipline, it is crucial that the modern project manager has the skills to distinguish and debate ethical issues. Helgadottir (2008:743) contends that outstanding project management abilities are grounded in the skills area where creativity, logical thinking and ethical awareness meet and

interrelate. Project managers must have the ability to manage the ethics of a situation. Despite increased consideration of ethical issues recently in the PMBOKs, it is still at a relatively high and superficial level. The PMI's PMBOK (2008), one of the most widely used bodies of knowledge, is the most lacking and does not provide for the ethical competencies required of a project manager. The PMI does however have a Code of Ethics and Professional Conduct that applies to all PMI members based on the four values of responsibility, respect, fairness and honesty (Bouley, 2007:5).

According to the APM (2006:118), both professionalism and ethics distil down to proper conduct. They define professionalism as "demonstrable awareness and application of qualities and competencies covering knowledge, appropriate skills and behaviours" (APM, 2006:118). Ethics is described as conduct and moral principles recognised by the project management profession as appropriate. Importantly a project manager must maintain high standards to the extent that he is an advocate for the profession. Furthermore a project manager must gain the trust and respect of all stakeholders he works for, including the project team.

Project managers rely much on their reputation however when executing projects in the most efficient and effective way they cannot afford to let moral standards and ethics slip. Bouley (2007:5) is quick to point out that countries around the world have different positions regarding what is ethical or not. In the context of globalisation project managers need to be well versed in what is ethically appropriate in the country in which they operate.

Lee (2009:459) argues that leadership and ethics are inseparable – both build relationships based on trust. Project managers thus have the moral responsibility to lead by example behaving ethically at all times. Ethical leadership behaviour in the context of virtual project teams is becoming more important as organisations move increasingly to virtual teams. Without face-to-face interaction, it is easier to deviate from appropriate ethical behaviour. Ethical issues for virtual team management as opposed to traditional project team management is an area that needs further study (Lee, 2009:462).

Helgadottir (2008:747-748) recommends that project management associations need to publish a code of conduct and that both organisations and educational institutions should give more attention to ethics in the context of projects. With ethics there is no one-size-fits-all. Often it is about balancing the ideal with the practical. Project managers must be

equipped with appropriate knowledge and tools and hold themselves accountable for their actions. Ethical management skills ensure that project managers deal appropriately with the rapid change and uncertainty experienced in projects (Lee, 2009:460).

Lecomber and Asumadu (2005:1) highlight that ethical behaviour of project managers extends to the environment and to project outcomes that are sustainable. They point out a lack of identified competencies and best practices in this regard. Project delivery must be sustainable in terms of societal impact but also in the use of natural resources. Project managers must be equipped with competencies to enable this agenda.

3.8 CONCLUSION

Project management is as much art as it is science. Scholars and practitioners of project management tend to agree that while the technical aspects of project management are important, it is the behavioural competencies, or soft skills, of project managers that are required for success – now and in the future. Soft skills can be learnt. The onus is on project managers and organisations to focus on the development of these skills. There is still much debate regarding which soft skills are the most critical for a project manager to be successful. Literature points to leadership and emotional intelligence as being common to most schools of thought. In particular, the concept of authentic leadership stands out in which leaders do not try to adopt a leadership persona but rather be themselves taking a values driven approach. There is general agreement that project management bodies of knowledge touch only lightly on the behavioural competencies of project managers. More research, debate and development are required in this area to better understand the soft skills that make a great project manager.

CHAPTER 4: EMPIRICAL STUDY

4.1 INTRODUCTION

This chapter details the empirical research study conducted within a South African project management organisation to explore the behavioural competencies of the future project manager. The main objective was to research the expected evolution of project manager behavioural skills and competencies over the next decade. Secondary objectives were to establish if perceptions differ amongst the respective demographic groups, the importance of leadership skills and how identified future behavioural competencies are addressed in current job profiles for project managers.

Using the literature study of Chapter 3 and the IMPA's ICB 3.0 (IMPA, 2006) as the basis, a new questionnaire was developed by the author with 16 behavioural competencies determined *a priori* as constructs to test the perceptions of respondents regarding the expected change in importance given to these behavioural competencies by project managers.

In addition to the questionnaire survey, structured interviews were conducted with purposively selected members of the project management organisation to obtain further insight into the future challenges facing project managers as highlighted in the literature study in Chapter 2 and as alternative means to validate the survey results. Project manager job profiles from within the project management organisation and from some global players in the construction industry were audited by the author to gain an appreciation of the extent to which the identified future behavioural competencies of project managers are required and valued by employers currently. Since the research study is exploratory in nature, the interviews and audits conducted add some perspective to the main research conducted via the questionnaire.

4.2 THE PROCEDURE AND SCOPE OF THE QUANTITIVE RESEARCH

The empirical study, to research the evolution of project manager behavioural skills and competencies over the next decade, set out to explore the perceptions of project

management professionals together with others in the project management organisation closely associated with the execution of projects.

4.2.1 SAMPLE GROUP AND SIZE

A South African project management organisation that executes construction projects of varying sizes (often greater than R1 billion) in South Africa and abroad was selected for the study. The target population selected within the PMO includes all of those individuals responsible for or associated with projects and the execution thereof. Thus the target population comprises of programme managers, functional managers, project managers, engineering managers, project team members and support staff such as those tasked with governance, training and so forth. The total **target population** is **839**. A breakdown of the target population according to functional department is given in Table 3 below:

Table 3. Target population details

Function	Number
Commercial and Legal	10
Engineering Management	61
Project Management and Control	294
Process Design	196
Environmental and Risk	36
Control Engineering	69
Electrical Engineering	46
Mechanical Engineering	98
Civil Engineering	9
Sustainability	20
Grand Total	**839**

4.2.2 SURVEY INSTRUMENT

Two main approaches are adopted by researchers, namely quantitative and qualitative. The quantitative approach involves evaluation of objective data (numbers) whilst the qualitative approach involves the interpretation of subjective data (usually language) obtained from human beings. Quantitative research utilises analysis based on complex structured methods in an attempt to gain an outsider's perspective. Qualitative research requires more flexible and explorative methods allowing the researcher to gain a deeper understanding

(insider's view) of the topic. In conducting quantitative research, surveys and questionnaires are popular tools used by the researcher to obtain data in a cost and time efficient manner. (Welman, Kruger & Mitchell, 2005:8-9).

To meet the research objectives a **quantitative approach** was selected. In order to maximise the number of responses in the available time frame **non-probability purposive sampling** was utilised to identify and select those specific functions in the PMO of interest to this particular research study.

A questionnaire was used as the survey instrument as it allows a quick response from the sample in the short time available allowing more individuals to be part of the research. Based on the literature study performed in Chapter 3 a new questionnaire was developed to assess respondent's perceptions of the importance of behaviours exhibited by project managers as **presently observed** (in 2011), compared with the respondent's **realistic expectation** of the importance in the future (*circa* 2020). The questionnaire consisted of 57 selection type questions in which respondents were required to assess the perceived importance given by project managers to stated behaviours as presently observed by the respondents compared with the importance of those realistically expected by respondents for project managers to be successful in the future (i.e. ten years from now).

The questionnaire was structured into two sections namely Section One – Demographics and Section Two – Project Management Behaviours. A four-point Likert scale was utilised to assess perceived importance: Not Important (1), Slightly Important (2), Quite Important (3) and Very Important (4).

Section One – Demographics

- D1 Functional area
- D2 Gender
- D3 Age
- D4 Highest qualification
- D5 Years in the project environment
- D6 Monetary value of projects (average)
- D7 Role

Section Two – Project Management Behaviours

- Q1 to Q57 (four-point Likert scale for importance now and in future)

Refer to Appendix A for the questionnaire developed for the research survey.

The questionnaire was purposefully designed by the author to test the 15 behavioural competences of the ICB 3.0 (2006) as **constructs**. Due to the importance of communication highlighted during the literature study, an additional construct for communication was included in the questionnaire. A construct, intentionally created, is an abstract concept used to represent a divergent collection of behaviours (Welman *et al*, 2005:21). Refer to Appendix C for the details of the 16 constructs and associated questions. Table 4 below highlights the constructs and the question numbers seeking to test the respective construct.

Table 4. Constructs and associated questions

Constructs	Questions	Associated Question Nos.
Leadership	4	Q25, Q44, Q53, Q56
Engagement and Motivation	4	Q5, Q7, Q24, Q47
Self-control	2	Q11, Q54
Assertiveness	4	Q12, Q15, Q31, Q55
Relaxation	2	Q16, Q26
Openness	4	Q10, Q14, Q18, Q23
Creativity	2	Q20, Q29
Results-orientation	3	Q2, Q9, Q21
Efficiency	4	Q6, Q17, Q27, Q49
Consultation	5	Q28, Q30, Q33, Q48, Q52
Negotiation	4	Q3, Q13, Q35, Q45
Conflict and Crisis	4	Q36, Q39, Q46, Q57
Reliability	4	Q19, Q38, Q40, Q42
Values Appreciation	3	Q32, Q41, Q43
Ethics	3	Q4, Q37, Q51
Communication	5	Q1, Q8, Q22, Q34, Q50

Structured follow-up interviews with selected respondents were conducted to provide clarification and further insight to aspects investigated via the questionnaire. The selection process for the interviews centred on targeting respondents with experience and considered knowledgeable in the field of project management.

In addition, audits were conducted on project manager job profiles to compare the current make-up required of project managers. Job profiles for project managers were obtained from within the project management organisation utilised for the research study and from a number of local and global organisations involved in projects in the construction industry.

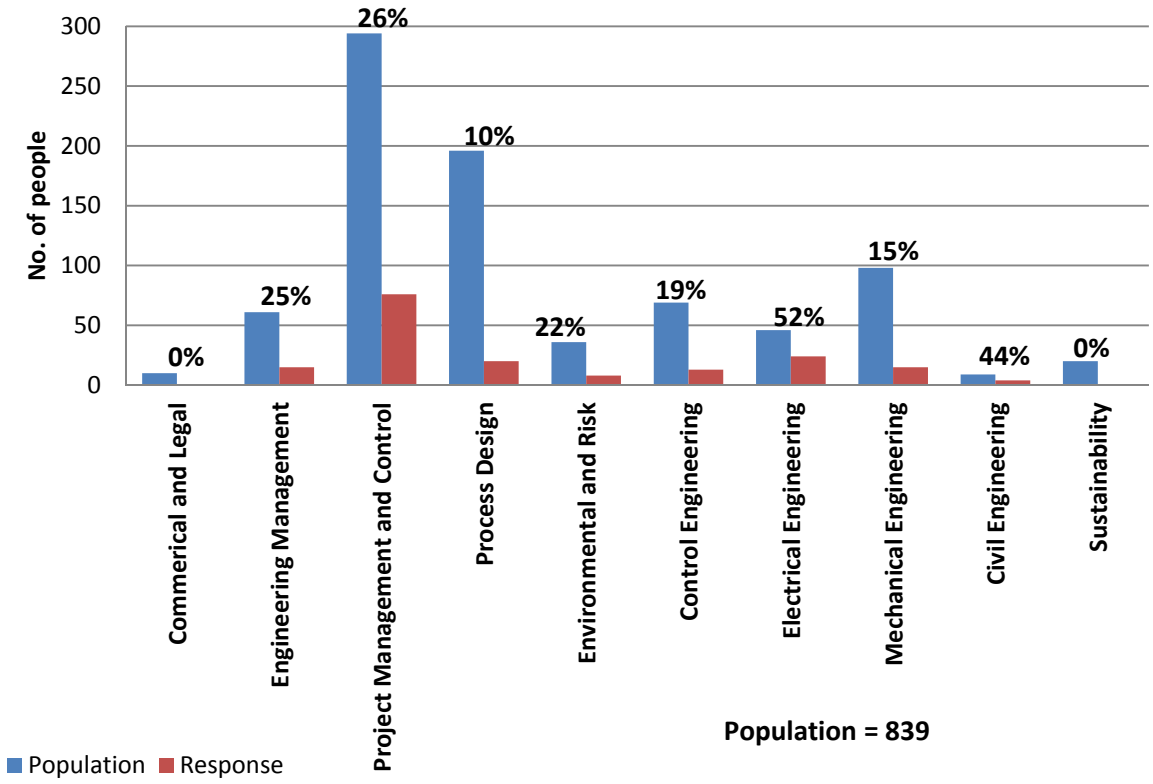
4.2.3 DATA COLLECTION

The questionnaire was electronically deployed to all members of the target population via an email sent from the author containing the background behind the study and a hyper-link to the survey created in the organisational electronic survey tool. Population members were assured that all responses would be treated anonymously by the electronic survey tool which was configured not to store any personal information of the respective respondent. An invitation was extended for population members to request the outcome of the research study by simply responding to the original email. The survey remained active for a period of two weeks. An email reminder was sent to population members two days prior to the closing of the survey.

A total of 208 responses to the electronic survey were accounted for. Only the responses that contained an opinion to at least one of the questions were retained for analysis purposes – 175 responses were retained and analysed.

Figure 14 summarises the response rate per functional area with an overall response rate of 20.86%.

Figure 14. Survey response rate per functional area



With the exception of the Commercial and Legal and Sustainability functions which had no respondents, the other functional areas were adequately represented with response rates varying between 10% (Process Design) and 52% (Electrical Engineering).

Table 5 to Table 11 below show the demographic information for the respondents.

Table 5. Demographic D1: Functional area

D1	Functional Area	Frequency	Percent
1	Commercial and Legal	0	0%
2	Engineering Management	15	9%
3	Project Management and Control	76	43%
4	Process Design	20	11%
5	Environmental and Risk	8	5%
6	Control Engineering	13	7%
7	Electrical Engineering	24	14%
8	Mechanical Engineering	15	9%
9	Civil Engineering	4	2%
10	Sustainability	0	0%
		175	**100%**

Table 6. Demographic D2: Gender

D2	Gender	Frequency	Percent
1	Male	139	79%
2	Female	36	21%
		175	**100%**

Table 7. Demographic D3: Age

D3	Age	Frequency	Percent
1	20 to 29	35	20%
2	30 to 39	49	28%
3	40 to 49	44	25%
4	50 to 59	41	23%
5	60 and above	6	3%
		175	**100%**

Table 8. Demographic D4: Highest qualification

D4	Highest Qualification	Frequency	Percent
1	Matric certificate	10	6%
2	Diploma	26	15%
3	Bachelor's degree	75	43%
4	Master's degree	55	31%
5	Doctorate	9	5%
		175	**100%**

Table 9. Demographic D5: Years in project environment

D5	Years in project environment	Frequency	Percent
1	Less than 5 years	42	24%
2	5 to 10 years	42	24%
3	11 to 15 years	27	15%
4	16 to 20 years	21	12%
5	More than 20 years	43	25%
		175	**100%**

Table 10. Demographic D6: Average monetary value of projects worked on

D6	Monetary value of projects	Frequency	Percent
1	Less than R1 million	10	6%
2	R1 million to R9.99 million	10	6%
3	R10 million to R99 million	23	13%
4	R100 million to R1 billion	58	33%
5	Over R1 billion	74	42%
		175	**100%**

Table 11. Demographic D7: Role

D7	Role	Frequency	Percent
1	Programme Manager / Portfolio Manager	10	6%
2	Project Manager	23	13%
3	Functional Manager	12	7%
4	Engineering Manager	17	10%
5	Project team member	89	51%
6	Member of project management organisation	24	14%
		175	**100%**

Table 5 shows a good spread of information gathering from the respective functional areas. Although no responses were received from the Commercial and Legal or Sustainability functions, the effect on the overall results should be minimal considering the relative small sizes of each area compared with the total population; 1.2% and 2.4% respectively. These departments are also not actively involved in the softer issues of project management. The lower response by female respondents (21%) is aligned with the target population that is by far male majority. The respondents are spread almost evenly over the age groups of interest except those over 60 years of age which are very low when compared with the others but are still aligned with the target population. Respondent's years of experience in the project environment is split with 25% having more than 20 years' experience, 27% having between 11 and 20 years and the remaining 48% distributed evenly over the 5 to 10 years and less

than 5 years categories. This indicates a wealth of experience in projects. The role of respondents regarding projects is aligned with the target population with the majority being project team members. As is evident in Table 10 most respondents (42%) are associated with projects exceeding R1 billion and 70% of all respondents associated with projects exceeding R100 million. Lastly, the majority of respondents have a Bachelor's degree as their highest qualification which is well aligned with the population consisting mostly of graduate engineers and scientists.

From the above discussion it is apparent that the respondents align well with and are representative of the target population.

4.3 FREQUENCY ANALYSIS AND DESCRIPTIVE STATISTICS

To facilitate the statistical analysis the responses to the questions were coded as detailed in Appendix B. The four-point Likert was coded as: Not Important = 1, Slightly Important = 2, Quite Important = 3 and Very Important = 4.

Responses assessing the perceived importance given by project managers to stated behaviours as **presently observed** by the respondents were analysed in the dataset **Observed**. Responses assessing of the importance of behaviours **realistically expected** by respondents for project managers to be successful in the future were analysed in the dataset **Expected**.

Using SAS (2005), a frequency analysis and descriptive statistics were performed on the Observed and Expected response datasets by Statistical Consultation Services of North West University. Refer to Appendix D for the summary of the frequency analysis and descriptive statistics.

4.3.1 ANALYSIS OF MEAN VALUES FOR OBSERVED QUESTIONS

For the Observed dataset the following questions yielded the **highest** mean values ($\bar{X}$) for the respondent's perception of the importance given by project managers to the stated behaviours as observed now:

- **Q1** Communicates effectively with stakeholders ($\bar{X}$ = 3.25, S = 0.78, C = *Communication*)
- **Q37** Respects ethical values in times of conflict or crisis ($\bar{X}$ = 3.08, S = 0.84, C = *Ethics*)
- **Q38** Delivers on what was agreed to the required quality, on time and within budget ($\bar{X}$ = 2.99, S = 0.83, C = *Reliability*)
- **Q45** Has the ability to negotiate through to a successful conclusion ($\bar{X}$ = 2.97, S = 0.76, C = *Negotiation*)

(S refers to the standard deviation, C refers to construct)

For the Observed dataset the following questions yielded the **lowest** mean values ($\bar{X}$) for the respondent's perception of the importance given by project managers to the stated behaviours as observed now:

- **Q15** Creates enthusiasm ($\bar{X}$ = 2.44, S = 0.91, C = *Assertiveness*)
- **Q20** Finds solutions by applying new concepts, tools and common sense in new areas ($\bar{X}$ = 2.50, S = 0.86, C = *Creativity*)
- **Q21** Continually challenges the status quo for improvements ($\bar{X}$ = 2.44, S = 0.91, C = Results-*orientation*)
- **Q27** Stimulates people to find improvements all the time ($\bar{X}$ = 2.50, S = 0.83, C = *Efficiency*)

4.3.2 ANALYSIS OF MEAN VALUES FOR EXPECTED QUESTIONS

For the Expected dataset the following question yielded the **highest** mean value ($\bar{X}$) for the respondent's perception of the importance given by project managers to the stated behaviours as expected in the future:

- **Q1** Communicates effectively with stakeholders ($\bar{X}$ = 3.82, S = 0.40, C = *Communication*)

For the Expected dataset the following questions yielded the **lowest** mean values ($\bar{X}$) for the respondent's perception of the importance given by project managers to the stated behaviours as expected in the future:

- **Q41** Adequately balances his own interests and those of others ($\bar{X}$ = 3.31, S = 0.55, C = *Values Appreciation*)
- **Q49** Is open to criticism ($\bar{X}$ = 3.31, S = 0.64, C = *Efficiency*)

4.4 ASSESSMENT OF THE CONSTRUCTS MEASURED IN THE STUDY

4.4.1 ARITHMETIC MEAN AND STANDARD DEVIATION

For any sample the arithmetic mean (or simply the mean), denoted $\bar{X}$, is the most commonly used measure of central tendency indicating the balance point in a set of data (Levine, Stephan, Krehbiel & Berenson , 2008:97). It is the average of the set of data. The standard deviation (S) of a sample is a measure of the extent of variation in a frequency distribution and it gives an indication of how close the data is to the mean – a higher standard deviation indicates a larger spread of data around the mean (Field, 2009:38). According to the empirical rule for bell-shaped distributions, 95% of the values in the sample data will fall within a distance of ± two standard deviations of the mean (Levine *et al*, 2008:120).

The arithmetic mean and standard deviation calculated for each of the 16 constructs observed now **(Observed)** and realistically expected in future **(Expected)** are given in Table 12.

Table 12. Arithmetic mean and standard deviation of constructs

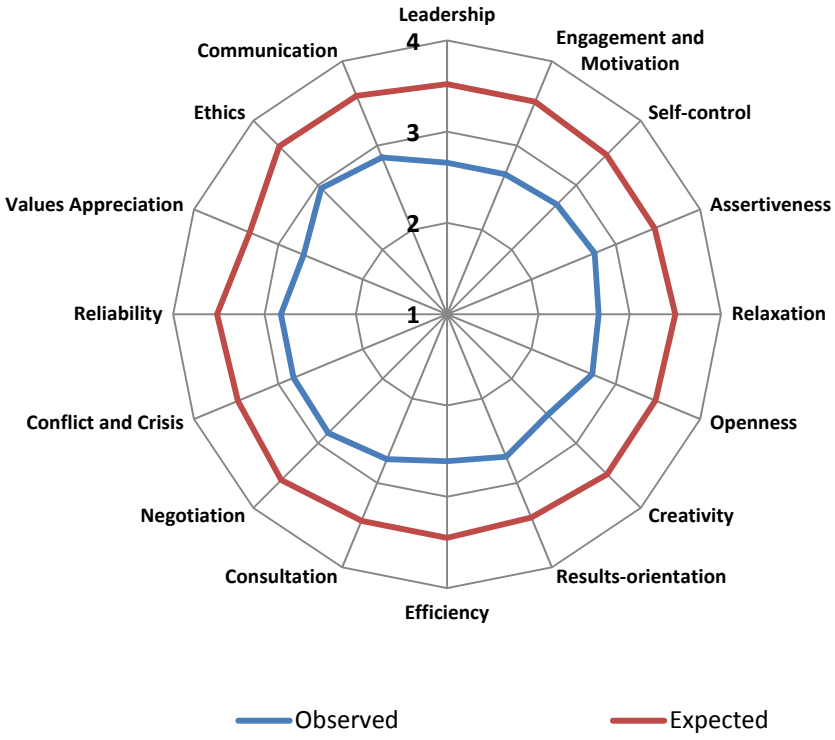
Constructs	n	Mean Observed	Std. Dev. Observed	Mean Expected	Std. Dev. Expected
Leadership	159	2.66	0.75	3.52	0.40
Engagement and Motivation	169	2.66	0.75	3.52	0.40
Self-control	168	2.70	0.72	3.47	0.49
Assertiveness	168	2.75	0.65	3.46	0.41
Relaxation	167	2.66	0.74	3.50	0.48
Openness	168	2.72	0.65	3.47	0.40
Creativity	164	2.56	0.77	3.48	0.51
Results-orientation	175	2.69	0.62	3.41	0.45
Efficiency	169	2.61	0.67	3.45	0.40
Consultation	159	2.72	0.67	3.45	0.39
Negotiation	175	2.84	0.67	3.57	0.36
Conflict and Crisis	156	2.82	0.66	3.48	0.36
Reliability	164	2.82	0.71	3.52	0.40
Values Appreciation	157	2.70	0.62	3.34	0.47
Ethics	175	2.95	0.70	3.60	0.41
Communication	175	2.86	0.69	3.59	0.32

For the Observed data, the construct ***Ethics*** ($\bar{X}$ = 2.95, S = 0.70) yielded the highest mean value whilst the construct ***Creativity*** ($\bar{X}$ = 2.56, S = 0.77) yielded the lowest mean value.

For the Expected data, the construct ***Ethics*** ($\bar{X}$ = 3.60, S = 0.40) yielded the highest mean value. Relatively high means were also obtained for the constructs ***Communication*** ($\bar{X}$ = 3.59, S = 0.32) and ***Negotiation*** ($\bar{X}$ = 3.57, S = 0.36). The construct ***Values Appreciation*** ($\bar{X}$ = 3.34, S = 0.47) yielded the lowest mean value.

Table 12 and Figure 15 show that on average respondents expect that in future project managers will need to elevate the importance they give to the complete range of constructs tested in the research study to be successful.

Figure 15. Comparison of construct means for Observed and Expected



4.4.2 RELIABILITY AND VALIDITY

Before analysing the results obtained via the questionnaire it is essential to test the reliability and validity of the newly developed questionnaire.

A questionnaire that is reliable is expected to provide results that are both accurate and consistent (Field, 2009:673). Thus reliability refers to the degree of consistency of a questionnaire and the extent to which the same results are obtained when employing the instrument repeatedly to the same groups or individuals (Ravid, 2011:192).

Various methods may be utilised to test the reliability of a questionnaire however the internal consistency methods offer the advantage to estimate reliability utilising scores from a single testing session rather than by repeating the test (Ravid, 2011:194-195). For this research study Cronbach's alpha coefficient was the internal consistency method utilised to estimate reliability.

Validity of a test refers to the degree to which the instrument actually measures what it was designed to measure (Ravid, 2011:204). Validity is particularly important if the test results are used to infer other aspects (Field, 2009:11). To measure the validity of the questionnaire used for the research study construct validity was utilised. Construct (or content) validity assesses the degree to which individual items in the questionnaire represent the construct being measured and that they cover the full range of the construct (Field, 2009:12). It is important to note that validity is a necessary but not sufficient condition – to be valid the instrument must first be reliable (Field, 2009:12).

Construct validity can be evaluated empirically using confirmatory factor analysis (CFA). Suhr (2006:1) describes CFA as a statistical technique applied to test the hypothesis that a relationship exists between the observed variables (items) and their underlying latent constructs. CFA is a confirmatory technique based on the researcher's hypothesised model from the literature study with constructs determined *a priori* (Schreiber, Nora, Stage, Barlow & King, 2006:323). The goal of CFA is to simplify the measurement model by using the underlying constructs to reduce complexity (Ullman, 2006:37). Huck (2012:480) simplifies the basic logic of factor analysis: "If two of the initial variables are highly related with each other but largely unrelated to any of the other variables, then those two variables should be merged together, with a new variable created so a single score can represent a person's standing on the two combined variables" – a small number of factors can adequately represent a larger number of original variables. CFA was performed in SAS (2005) using the Observed dataset taking into account Kaiser's measure of sampling adequacy, percentage variation explained and the variation of communalities.

4.4.2.1 CRONBACH'S ALPHA COEFFICIENT

In 1951 Lee Cronbach proposed calculating the alpha coefficient as a means to determine the internal consistency (reliability) of test (Cronbach, 1951:297-334). Calculating Cronbach's alpha to measure the internal consistency of a test is a common practice where multiple-item measures of a construct are applied (Tavakol & Dennick, 2011:53). Using Cronbach's alpha as a test for reliability is well suited to questionnaires that use a Likert scale (Ravid, 2011:196). Field (2009:674) explains Cronbach's alpha coefficient as a measure which splits the data in two in all ways possible and calculating the correlation coefficient for each split. Cronbach's alpha coefficient is then the average of these values. The calculation for Cronbach's alpha coefficient is given in Equation 1.

Equation 1. Cronbach's alpha coefficient

$$\alpha = \frac{k}{k-1}\left[1 - \frac{\sum_1^k S_i^2}{S_T^2}\right]$$

Where:

α = Cronbach's alpha coefficient

k = number of items in the analysis

S_i = item standard deviation

S_T= total standard deviation of all items in the construct

Source: Cronbach & Shavelson (2004:396)

Cronbach's alpha coefficient is stated as a number between 0 and 1 describing the extent to which items which measure the same construct, i.e. the inter-relatedness of the items (Tavokol & Dennick, 2011:53). Field (2009:675) refers to a generally acceptable value of Cronbach's alpha of greater than 0.8 for cognitive tests (e.g. intelligence tests) whilst lower values of greater than 0.7 are suitable for ability tests. According to Field (2009:675), when testing psychological constructs even lower values can be realistically accepted due to the diversity of constructs being measured. It is important to note that Cronbach's alpha is influenced by the length of the test; shorter tests will produce lower values for alpha (Tavakol & Dennick, 2011:53). Thus, where fewer items are used to test a construct, lower values of Cronbach's alpha can be expected relative to where more items are used.

Cronbach's alpha coefficient was calculated using SAS (2005) for each of the 16 constructs and the results are given in Table 13. Items used to test constructs range in number from two (*Self-Control*) to five (*Consultation* and *Communication*).

Table 13. Cronbach's Alpha Coefficient

Constructs	No. of items	Cronbach's Alpha Coefficient (α)
Leadership	4	0.86
Engagement and Motivation	4	0.81
Self-control	2	0.49
Assertiveness	4	0.82
Relaxation	2	0.68
Openness	4	0.77
Creativity	2	0.74
Results-orientation	3	0.68
Efficiency	4	0.76
Consultation	5	0.86
Negotiation	4	0.81
Conflict and Crisis	4	0.84
Reliability	4	0.83
Values Appreciation	3	0.72
Ethics	3	0.65
Communication	5	0.84

Three constructs yielded a Cronbach's alpha of less than 0.7:

- *Self-control* (2 items) ($\alpha = 0.49$)
- *Results-orientation* (3 items) ($\alpha = 0.68$)
- *Ethics* (3 items) ($\alpha = 0.65$)

Since attitudes are being measured rather than ability all constructs with Cronbach's alpha of 0.5 and above were used. The majority (50%) of the Cronbach's alpha coefficients calculated were found to be greater than 0.8 which indicates a high degree of internal consistency for the questionnaire used. The questionnaire used to test the 16 constructs can therefore be regarded as reliable.

Thus, based on the above, the mean response count for each of the 16 constructs in Table 13 can be used in analysis to draw conclusions regarding the behaviours of project managers in the population. Separate analysis of responses received for each of the 57 questions in the questionnaire is not necessary.

4.4.2.2 KAISER'S MEASURE OF SAMPLE ADEQUACY

The measure of sampling adequacy (MSA) is a test developed by Kaiser, Meyer and Olkin that gives an indication of the inter-correlations between variables (Field, 2009:647). The degree to which variables are related is essential in evaluating whether a factor analysis is appropriate (Field, 2009:647). The MSA statistic varies between 0 and 1 and the closer the value to 1 the more it is likely that a factor analysis should yield distinct and reliable factors (Field, 2009:647).

Field (2009:647) reports the following guidelines for the interpretation of the MSA statistic:

- 0.00 to 0.49 unacceptable
- 0.50 to 0.59 miserable
- 0.60 to 0.69 mediocre
- 0.70 to 0.79 middling
- 0.80 to 0.89 meritorious
- 0.90 to 1.00 marvellous

A cut-off value for MSA of 0.50 is suggested whilst values of 0.80 or higher are desirable (Field, 2009:647).
Using SAS (2005) the MSA values for the 16 constructs were calculated and are given in Table 14.

Table 14. Kaiser's measure of sample adequacy

Constructs	No. of items	Overall MSA
Leadership	4	0.81
Engagement and Motivation	4	0.78
Self-control	2	0.50
Assertiveness	4	0.81
Relaxation	2	0.50
Openness	4	0.76
Creativity	2	0.50
Results-orientation	3	0.67
Efficiency	4	0.74
Consultation	5	0.82
Negotiation	4	0.76
Conflict and Crisis	4	0.80
Reliability	4	0.80
Values Appreciation	3	0.65
Ethics	3	0.58
Communication	5	0.85

Two constructs, ***Self-control*** and ***Creativity*** yielded low values of 0.50 in the miserable range. Six constructs were found to have MSA values above 0.80 in the meritorious range. The remainder were in the mediocre to middling range. With all MSA values being equal to or greater than the suggested cut-off value of 0.5, it can be concluded that performing a factor analysis to confirm the model of 16 constructs is appropriate.

4.4.2.3 FACTOR VARIATION

The eigenvalues of the correlation matrix of the items associated with each of the 16 constructs were calculated using SAS (2005). The eigenvalues associated with each construct represent the amount of variance that may be explained by that particular linear component (Field, 2009:660). Applying Kaiser's eigenvalue-greater-than-one (MINEIGEN) criterion in SAS (2005) allows factors with eigenvalues of greater than 1 to be extracted – an eigenvalue of greater than 1 is equivalent to the variance of 1 item. This methodology is one of the most popular used by researchers to determine the number of factors needed to explain correlations among variables (Field, 2009:660). From the SAS (2005) results only 1 factor was retained by the MINEIGEN criterion for each of the constructs. Table 15 shows

the percentage variation that is explained by each of the constructs as calculated in SAS (2005).

Table 15. Factor variation

Constructs	Factors	Percentage Variation Explained
Leadership	1	71.18%
Engagement and Motivation	1	64.63%
Self-control	1	66.43%
Assertiveness	1	64.59%
Relaxation	1	75.64%
Openness	1	59.82%
Creativity	1	79.54%
Results-orientation	1	66.59%
Efficiency	1	58.08%
Consultation	1	64.03%
Negotiation	1	63.83%
Conflict and Crisis	1	67.20%
Reliability	1	65.96%
Values Appreciation	1	64.88%
Ethics	1	57.85%
Communication	1	60.76%

From Table 15 it is evident that the percentage variation explained by the respective constructs lies between a low of **57.85%** for the construct ***Ethics*** and **79.54%** for the construct ***Creativity***. Three of the constructs yielded values of percentage variation explained of greater than 70% namely ***Leadership*** **(71.18%)**, ***Relaxation*** **(75.64%)** and ***Creativity*** **(79.54%)**.

The calculations performed show that all items displayed substantial loading on their target factors (constructs). Convergent and discriminant validity was established in the process. Convergent reliability is shown when high factor loadings are obtained for a given latent variable's indicator variables and discriminant validity is shown when small factor loadings for other indicator variables are obtained for that latent variable (Huck, 2012:499).

From the above discussion it is clear that an appropriate level of information is retained using only the constructs as factors in the model.

4.4.2.4 VARIATION OF COMMUNALITIES

Field (2009:637) highlights that communality is the proportion of common variance present in a variable that is explained by the extracted factors (retained components). Using SAS (2005) communalities were calculated representing the multiple correlation between each variable and the extracted factors. A variable that has no specific variance would have a communality of 1 and a variable that shares none of its variance with another variable would have a communality of 0 (Field, 2009:637). Thus variables with a high communality weigh heavily on at least one of the retained components and those with low communality suggest that they do not share much in common with the extracted components.

Table 16 shows the range of communalities calculated for the questions associated with each of the constructs.

Table 16. Communality variation

Constructs	Lowest	Highest
Leadership	0.66	0.74
Engagement and Motivation	0.49	0.76
Self-control	0.66	0.66
Assertiveness	0.61	0.68
Relaxation	0.76	0.76
Openness	0.53	0.66
Creativity	0.80	0.80
Results-orientation	0.59	0.64
Efficiency	0.51	0.62
Consultation	0.61	0.66
Negotiation	0.60	0.74
Conflict and Crisis	0.66	0.69
Reliability	0.61	0.75
Values Appreciation	0.52	0.72
Ethics	0.33	0.73
Communication	0.47	0.73

The question from the questionnaire with the lowest contribution to a construct falls within the construct ***Ethics*** (0.33) whilst the question with the highest contribution falls within the construct ***Creativity*** (0.80).

Based on the above it can be concluded that the range of communalities calculated are high enough for the model, using the 16 retained constructs, to be acceptable for analysis.

4.4.2.5 CONCLUSION REGARDING RELIABILITY AND VALIDITY

The reliability of the newly developed questionnaire was found to be acceptable with Cronbach's alpha coefficients calculated to be above 0.5 and a majority exceeding 0.8.

With the aid of the confirmatory factor analysis performed in SAS (2005) it was found that the validity of the questionnaire is acceptable and that the constructs determined *a priori* by the researcher allow an appropriate level of information to be retained when only analysing the constructs.

4.5 COMPARISON OF OBSERVED AND EXPECTED BEHAVIOURS

Since it is almost never practical to deal with an entire population when conducting research, random samples are drawn from the population and tested for statistical significance allowing conclusions to be reached about the population from which the sample was drawn (Steyn, 2002:10). Researchers calculate the *p*-value as a criterion to determine if the results obtained are statistically significant. The *p*-value gives the probability that the obtained result could be achieved applying the assumption that the null hypothesis is true, that there is no difference between the population means (Ellis & Steyn, 2003:51). Levine *et al* (2008:337) referring to the *p*-value as the observed level of significance, indicate that it provides the probability of obtaining a test statistic equal to or more extreme than the sample result given the null hypothesis to be true. Generally a 95% confidence, or *p*-value smaller than 0.05, is used by researchers as sufficient evidence that a result is statistically significant (Field, 2009:51). Ellis and Steyn (2003:51) point out that while a small *p*-value indicates statistical significance, practically the result may not be important. This is because as the size of data sets increases, *p*-value tests tend to yield smaller values.

Although non-probability purposive sampling was used for this study, for the sake of completeness, p-values will be reported as if probability sampling was done. Ellis and Steyn (2003:51) highlight that data obtained via convenience sampling is often analysed erroneously as if it were obtained via probability sampling. They suggest that in such cases

data should be considered as small populations for which statistical inference and p-values is not relevant.

To interpret results for practical significance, effect sizes need to be calculated from the descriptive statistics in order to establish the importance of a relationship that has been found to be statistically important (Ellis & Steyn, 2003:51; Steyn, 2002:10). Ellis (2010:7) states that effect sizes can be divided into two families: differences between groups (known as the *d* family) and measures of association between groups (known as the *r* family).

Field (2009:317) identifies analysing the differences between two means as an appropriate methodology when comparing two groups. Effect sizes lend themselves to making judgements regarding the differences in the means as they are "standardised" measures which do not depend on the respective sample sizes (Steyn, 2000:1). Field (2009:56) describes an effect size as an objective and standardised measure of the magnitude of an observed effect.

Many measures of effect size have been proposed in the literature however one of the most commonly used for the effect sizes of differences is Cohen's *d* (Field, 2009:57; Steyn, 2002:10; Ellis, 2010:10). Cohen's *d* for samples from populations can be estimated from the sample means using Equation 2.

Equation 2. Calculation of Cohen's *d*

$$d = \frac{\bar{X}_1 - \bar{X}_2}{S}$$

Where:

$\bar{X}_1$ = mean of sample 1 (**Observed** dataset in this study)

$\bar{X}_2$ = mean of sample 2 (**Expected** dataset in this study)

$S = \sqrt{\frac{S_1^2 + S_2^2}{2}}$ (estimate of pooled standard deviation)

S_1 = standard deviation of sample 1

S_2 = standard deviation of sample 2

Source: Steyn (2000:2)

Cohen (1988:40) provides the following guidelines for the interpretation of the effect size given the value of *d*:

- *d* = 0.2 small effect
- *d* = 0.5 medium effect (noticeable with the naked eye)
- *d* ≥ 0.8 large effect (practically significant and therefore of practical importance)

Therefore when *d* is calculated to be greater than 0.8, the effect size is large and considered to be practically significant and thus of practical importance.

4.5.1 DIFFERENCES BETWEEN MEANS – OBSERVED AND EXPECTED

Using the analysis of variance (ANOVA) methodology in SAS (2005) the difference of means calculated for each of the 16 constructs for the Observed and Expected datasets were analysed for statistical significance. *Post hoc* pairwise comparisons (t-tests) were performed in SAS (2005) to compare the differences in means (Observed – Expected) for each of the constructs. The effect size between the means for the Observed and Expected datasets was manually calculated using Equation 2 for Cohen's *d* where X_1, S_1 represent the **Observed** dataset and X_2, S_2 represent the **Expected** dataset. The results of the tests are summarised in Table 17 below.

Table 17. *Post hoc* paired t-tests and effect sizes for Observed – Expected construct pairs

Constructs	n	Mean Difference (Observed – Expected)	Std. Dev. Difference	*p*-values [(a)] (in case of probability sampling)	Cohen's *d* Effect Size
Leadership	159	- 0.86	0.77	0.00 *	1.42 ▲
Engagement and Motivation	169	- 0.84	0.70	0.00 *	1.39 ▲
Self-control	168	- 0.77	0.70	0.00 *	1.25 ▲
Assertiveness	168	- 0.70	0.63	0.00 *	1.30 ▲
Relaxation	167	- 0.84	0.74	0.00 *	1.35 ▲
Openness	168	- 0.75	0.65	0.00 *	1.39 ▲
Creativity	164	- 0.92	0.77	0.00 *	1.41 ▲
Results-orientation	175	- 0.72	0.68	0.00 *	1.33 ▲
Efficiency	169	- 0.84	0.64	0.00 *	1.46 ▲
Consultation	159	- 0.73	0.65	0.00 *	1.34 ▲
Negotiation	175	- 0.73	0.63	0.00 *	1.35 ▲
Conflict and Crisis	156	- 0.66	0.60	0.00 *	1.24 ▲
Reliability	164	- 0.71	0.72	0.00 *	1.23 ▲
Values Appreciation	157	- 0.64	0.64	0.00 *	1.17 ▲
Ethics	175	- 0.65	0.67	0.00 *	1.14 ▲
Communication	175	- 0.73	0.68	0.00 *	1.36 ▲

[(a)] *p*-value yielded by paired t-test for dependent groups in the case of probability sampling

* Statistically significant on a 0.05 level

▲ Practically significant ($d \geq 0.80$)

Table 17 shows that the results of the t-tests for the difference in construct means are statistically significant for all constructs with very low p-values calculated (< 0.001). Negative values for the differences in means (Observed – Expected) for all constructs can be explained since respondents on average expect that in future project managers will need to elevate the importance they give to the complete range of constructs tested in the research study to be successful. The calculations performed for effect size (Cohen's *d*) show that the differences between the Observed and Expected for all constructs can be regarded as large ($d > 0.80$) and thus of practical significance. Effect sizes were found to vary between a high of 1.46 **(*Efficiency*)** and a low of 1.14 **(*Ethics*)** – a spread of 29%. Table 18 gives the ranking order of the respective constructs from the largest effect size to the lowest.

Table 18. Ranking of constructs according to Cohen's *d* effect sizes

Ranking	Constructs	Cohen's *d* Effect Size
1	Efficiency	1.46
2	Leadership	1.42
3	Creativity	1.41
4	Openness	1.39
5	Engagement and Motivation	1.39
6	Communication	1.36
7	Relaxation	1.35
8	Negotiation	1.35
9	Consultation	1.34
10	Results-orientation	1.33
11	Assertiveness	1.30
12	Self-control	1.25
13	Conflict and Crisis	1.24
14	Reliability	1.23
15	Values Appreciation	1.17
16	Ethics	1.14

The ranking of the respective constructs in descending order of effect size shows how respondents perceive the growth in importance of each of the constructs (behaviours of project managers). Inspection of Table 18 highlights that some of the constructs have equal effect sizes: *Openness* and *Engagement and Motivation* with d = 1.39; *Relaxation* and *Negotiation* with d = 1.35. Additionally, it is clear that some constructs differ only slightly in the effect size between Observed and Expected. Steyn (2000:1) warns that it is sometimes "difficult to get a feeling for the scale" when interpreting Cohen's *d* effect sizes. However, due to the exploratory nature of this research study, being able to obtain a ranking of constructs according to the expectations of respondents is adequate rather than trying to analyse the differences in effect sizes between constructs.

4.5.2 DIFFERENCES BETWEEN MEANS FOR DEMOGRAPHICS – OBSERVED AND EXPECTED

Exploring the expectations of the various items making up the respective demographics can provide important information that can form a basis for future talent development for project managers. Using the approach followed above in Section 4.5.1, the differences between the means of each of the constructs were tested for the Observed and Expected datasets for

each of the items (e.g. male and female) making up the respective demographic group (e.g. gender) to compare the expectations regarding the importance of project manager behaviours in the future. In the sections below spider diagrams are utilised to perform the comparison of the Cohen's *d* effect sizes for the various items. Since the difference in effect sizes (i.e. small, medium or large difference) is difficult to quantify as per Steyn (2000:1), only interesting observations are highlighted in the discussion.

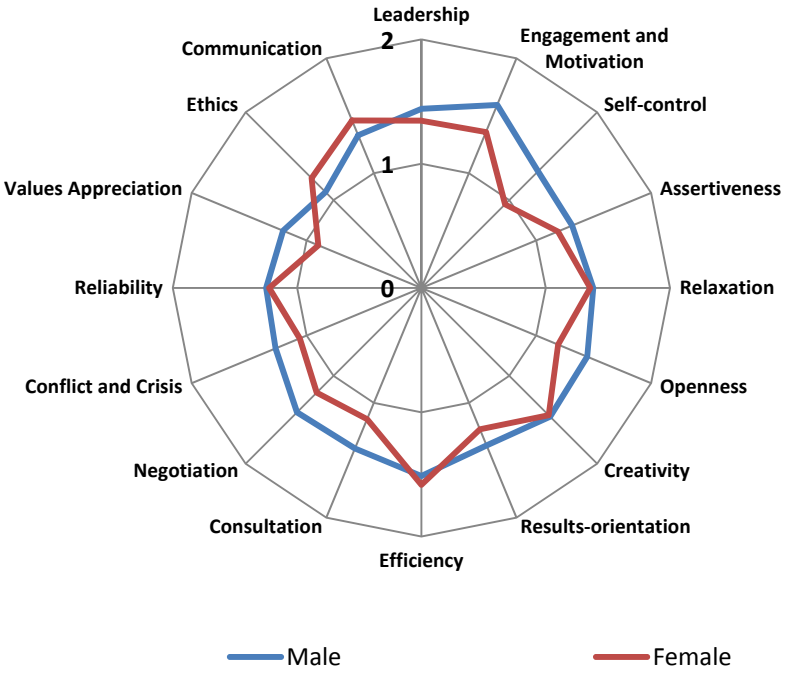
Refer to Appendix E for the detailed tabulated results for each of the respective demographics.

In all of the paired tests the differences in the means, Observed – Expected, were calculated to be negative values. As highlighted previously, negative values for the differences in means (Observed – Expected) for all constructs can be explained since respondents on average expect that in future project managers, to be successful, will need to elevate the importance they give to the complete range of constructs tested in the research study.

4.5.2.1 GENDER

Figure 16 gives the comparison in Cohen's *d* effect sizes for the respective gender.

Figure 16. Comparison of Cohen's *d* effect size for male and female gender for Observed - Expected



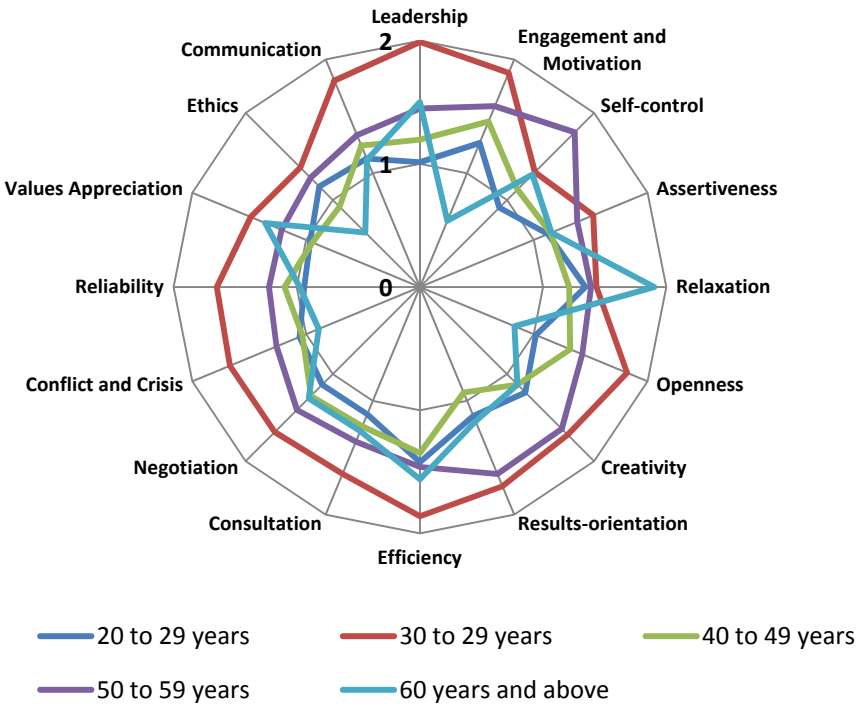
The differences in the means for the items making up the demographic group **Gender** were found to be statistically significant (*p*-values < 0.05) and practically significant (*d* > 0.8).

Of the respondents the male gender was found to have generally larger effect sizes for all the constructs except for *Efficiency*, *Ethics* and *Communication* where female respondents had larger effect sizes. The widest gap in the effect sizes between male and female respondents was found for the construct *Self-control* (Males *d* = 1.33, Females *d* = 0.95). Respondents from both genders have similar expectations regarding the constructs *Relaxation*, *Creativity* and *Reliability* where the effect sizes were close together.

4.5.2.2 AGE

Figure 17 gives the comparison in Cohen's *d* effect sizes for the respective age groups of respondents.

Figure 17. Comparison of Cohen's *d* effect size for age groups for Observed - Expected



The differences in the means for the items making up the demographic group **Age** were found to be statistically significant (*p*-values < 0.05) and practically significant (*d* > 0.8) except for the age group **60 years and above**. This is due to the small number of respondents (*n* = 6) in the group.

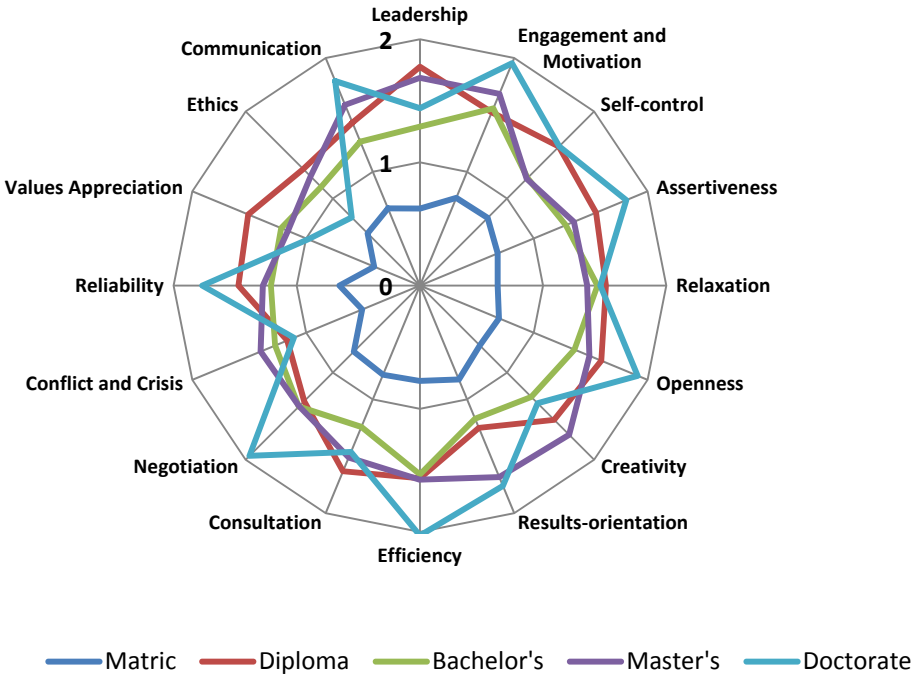
The differences in the means for the following constructs in the **60 years and above** age group were found not to be statistically significant: *Engagement and Motivation* (*p* = 0.16), *Openness* (*p* = 0.08), *Results-orientation* (*p* = 0.11), *Reliability* (*p* = 0.07) and *Communication* (*p* =0.07). In the same age group, the differences in the means for the constructs *Engagement and Motivation* (*d* = 0.58) and *Ethics* (*d* = 0.63) were found not to be practically significant.

With the exception of the 30 to 39 years age group, generally speaking the other age groups have similar effect sizes. The 30 to 39 years age group perceives a larger delta between what they observe now of the importance given by project managers to behaviours and that required to be successful ten years from now. This grouping see the greatest gap being with the construct *Leadership* (*d* = 1.99). Respondents in the 60 years and above age group perceive that a large gap exists in the construct *Relaxation* (*d* = 1.90) in comparison with the other age groups.

4.5.2.3 HIGHEST QUALIFICATION

Figure 18 gives the comparison in Cohen's *d* effect sizes for the highest qualification obtained by respondents.

Figure 18. Comparison of Cohen's *d* effect size for highest qualification obtained for Observed - Expected



The differences in the means for the items making up the demographic group **Highest Qualification** were found to be statistically significant (*p*-values < 0.05) and practically significant (*d* > 0.8) except for the small groups with **Matric Certificate** (*n* = 10) and **Doctorate** (*n* = 9).

For the group with **Matric Certificates** none of the results for the differences in the means were found to be statistically significant.

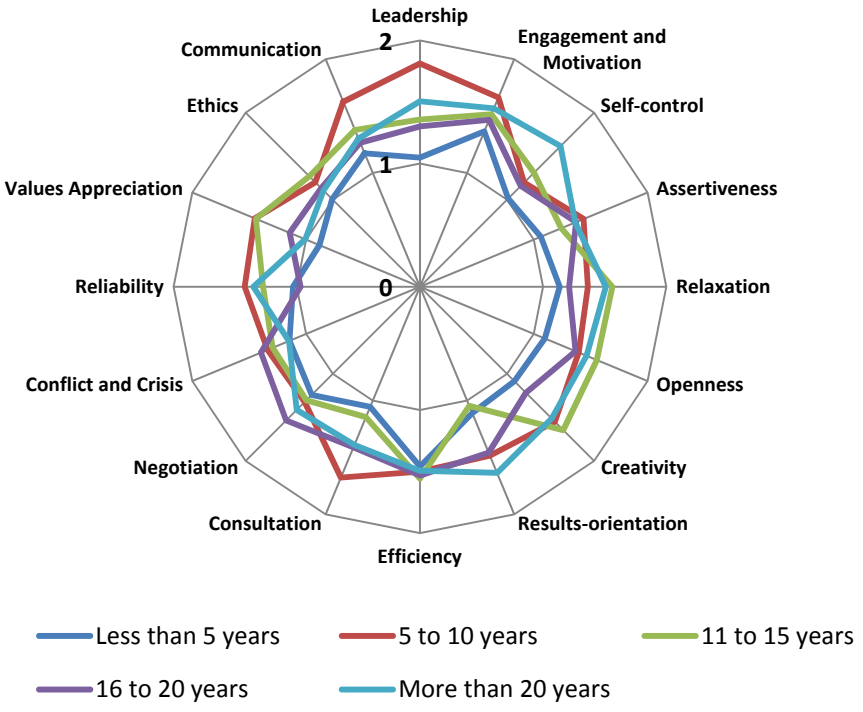
For the group **Doctorate**, the differences in the means for the constructs *Values Appreciation* (p = 0.07) and *Ethics* (p = 0.07) were found to not be statistically significant.

Figure 18 shows that apart from some minor exceptions, all groups other than those with a Matric Certificate or Doctorate as highest qualification, have similar expectations regarding the delta between now and future for the importance of project manager's behaviours. The largest effect sizes were found for the group of respondents with Doctorates (max d = 2.03 for *Efficiency*). Conclusions cannot be drawn from those with Matric Certificates since all effect sizes were found to not be statistically significant.

4.5.2.4 YEARS IN PROJECT ENVIRONMENT

Figure 19 gives the comparison in Cohen's d effect sizes for the number of years that respondents have been in the project environment.

Figure 19. Comparison of Cohen's d effect size for years in the project environment for Observed - Expected



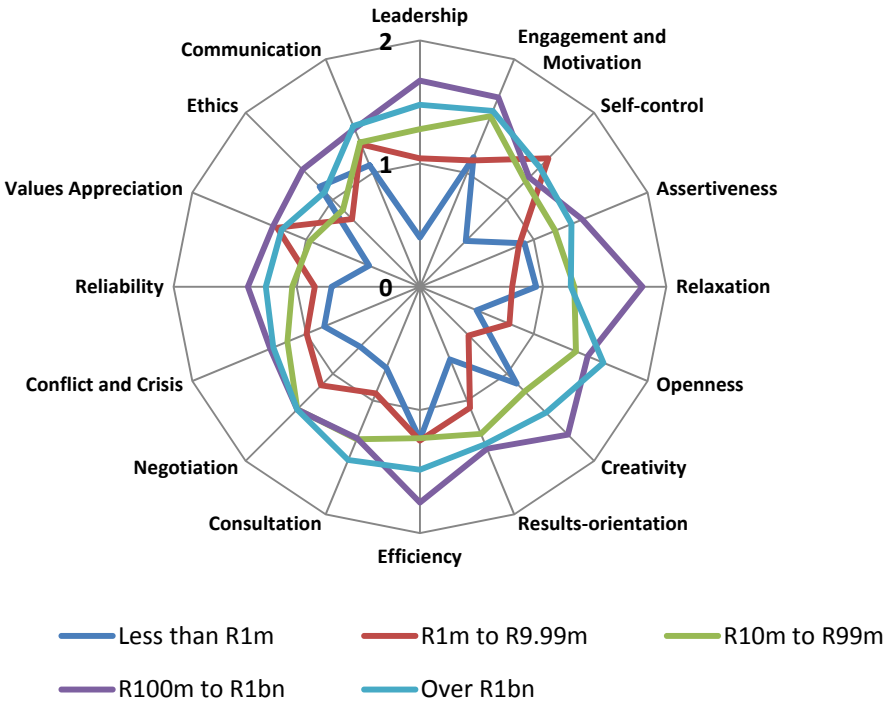
The differences in the means for the items making up the demographic group **Years in Project Environment** were found to be statistically significant (*p*-values < 0.05) and practically significant (*d* > 0.8).

Figure 19 shows a relatively similar trend in expectations of respondents based on their number of years spent in the project environment. Those with less experience tend to indicate lower effect sizes for the importance of project manager's behaviours observed now and realistically expected in the future. What is noticeable is the larger effect sizes for the respondents with 5 to 10 years' experience in the project environment for the constructs *Leadership* (*d* = 1.81), *Consultation* (*d* = 1.68) and *Communication* (*d* = 1.63) when compared with other respondents. Respondents with over 20 years' experience have a larger effect size than the others for the construct *Self-control* (*d* = 1.61).

4.5.2.5 MONETARY VALUE OF PROJECTS

Figure 20 gives the comparison in Cohen's *d* effect sizes for the monetary value of projects in which respondents were involved.

Figure 20. Comparison of Cohen's *d* effect size for monetary value of projects for Observed - Expected



The differences in the means for the items making up the demographic group **Monetary Value of Projects** were found to be statistically significant (p-values < 0.05) and practically significant (d > 0.8) except for the small groups **Less than R1 million** (n = 10) and **R1 million to R9.99 million** (n = 10).

For the group **Less than R1 million** the differences in the means for the following constructs were found to not be statistically significant: *Leadership* (p = 0.13), *Self-control* (p = 0.07), *Reliability* (p = 0.12) and *Values Appreciation* (p = 0.20). The differences in the means for a number of constructs in this group were found to not be practically significant: *Leadership* (d = 0.4), *Self-control* (d = 0.53), *Openness* (d = 0.50), *Results-orientation* (d= 0.64), *Consultation* (d = 0.71), *Negotiation* (d = 0.69), *Reliability* (d = 0.72) and *Values Appreciation* (d = 0.45).

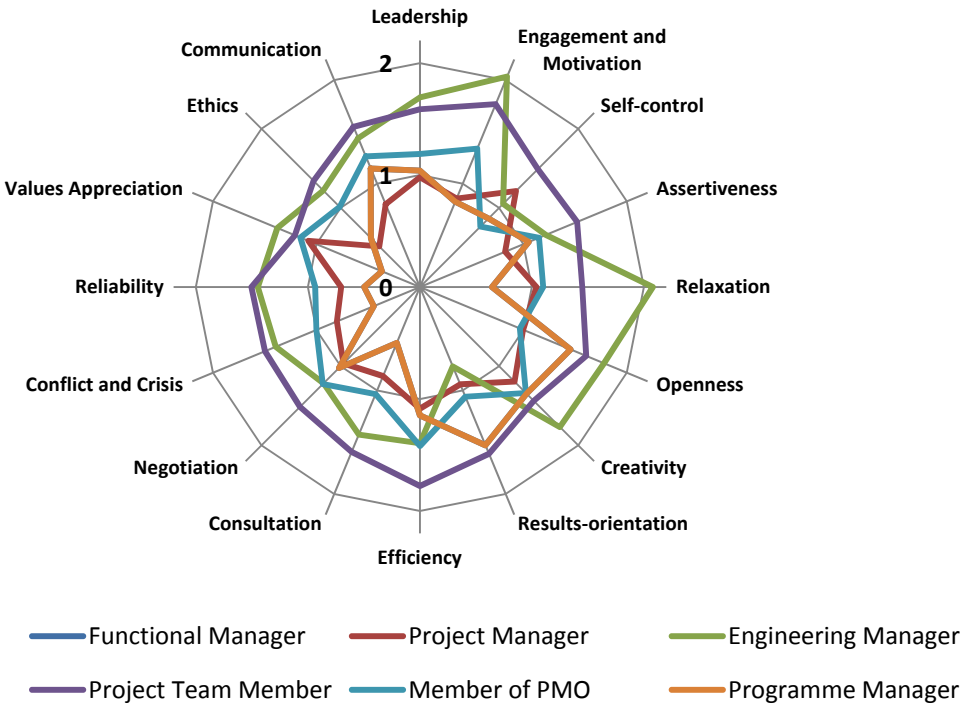
For the group **R1 million to R9.99 million** the differences in the means for the following constructs were found to not be statistically significant: *Leadership* (p = 0.06) and *Creativity* (p = 0.17). The differences in means for constructs in this group found to not be practically significant include: *Relaxation* (d = 0.75), *Openness* (d = 0.79), *Creativity* (d = 0.56) and *Ethics* (d = 0.78).

Figure 20 indicates that respondents involved with bigger projects (greater than R100 million) have greater expectations for the importance of project manager's behaviours for most of the constructs. In particular, larger effect sizes were found for *Leadership*, *Relaxation*, *Creativity*, *Efficiency* and *Ethics* for those working on projects exceeding R100 million than the other respondents.

4.5.2.6 ROLE

Figure 21 gives the comparison in Cohen's *d* effect sizes for the respective roles of respondents during project execution.

Figure 21. Comparison of Cohen's *d* effect size for role in projects for Observed - Expected



The differences in the means for the items making up the demographic group **Role** were found to be statistically significant (*p*-values < 0.05) and practically significant (*d* > 0.8) except for the small groups **Programme Manager / Portfolio Manager** (*n* = 10) and **Project Manager** (*n* = 23).

For the group **Programme Manager / Project Manager** the differences in the means for the following constructs were found to not be statistically significant: *Self-control* (*p* = 0.06), *Relaxation* (*p* = 0.24), *Consultation* (*p* = 0.15), *Conflict and Crisis* (*p*= 0.14), *Reliability* (*p* = 0.19), *Values Appreciation* (*p* = 0.35) and *Ethics* (*p* = 0.15). The differences in the means for a number of constructs in this group were found not to be practically significant namely: *Relaxation* (*d* = 0.64), *Conflict and Crisis* (*d* = 0.44), *Reliability* (*d* = 0.50), *Values Appreciation* (*d* = 0.37) and *Ethics* (*d* = 0.62).

For the group **Project Manager** the differences in the means for the constructs *Reliability* (*d* = 0.70) and *Ethics* (*d* = 0.51) were found to <u>not</u> be practically significant.

Figure 21 shows a diverse set of expectations of respondents fulfilling respective roles on projects. Respondents closest to the project (Engineering Managers and Project Team Members) were found to have the largest effect sizes in general for the majority of the constructs for the importance (Observed – Expected) of project manager's behaviours. There is also some alignment amongst those closest to the project regarding the constructs where they perceive the greatest gaps (*d* > 1.50) namely: *Leadership*, *Engagement and Motivation* and *Openness*. Engineering managers indicated comparatively high effect sizes than other respondents for the constructs *Engagement and Motivation* (*d* = 2.03), *Relaxation* (*d* = 2.08), *Openness* (*d* = 1.78) and *Creativity* (*d* = 1.77). Project team members perceive the greatest effect size to be for the construct *Efficiency* (*d* = 1.78).

Figure 22 compares Cohen's *d* effect sizes for project managers with the grouping of all others associated with projects (rest of team).

Figure 22. Comparison of Cohen's *d* effect size for role in projects for Observed – Expected: project managers vs. all others

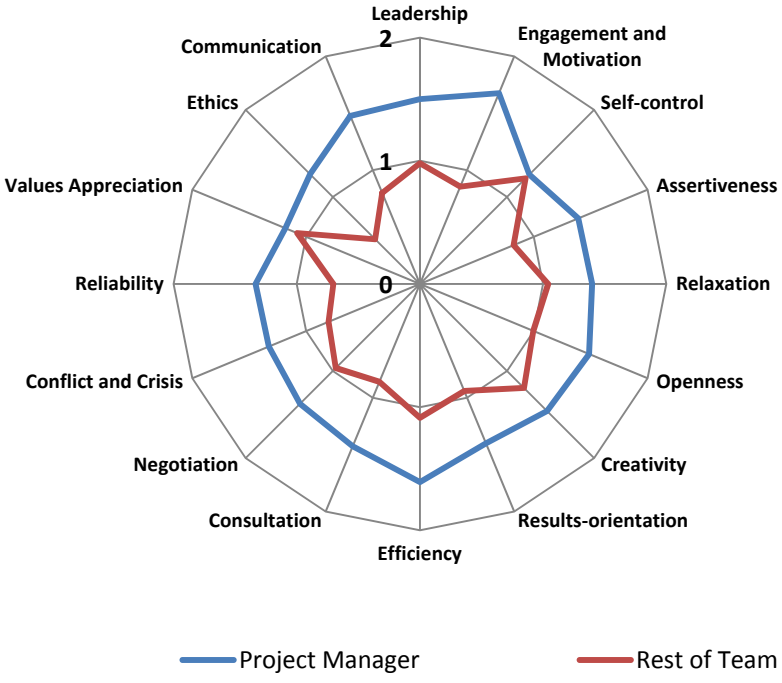


Figure 22 highlights that the project managers and the rest of the team are only aligned on two constructs, *Self-control* and *Values Appreciation*, where the effect sizes are similar. It is clear from the comparison that project managers do not perceive themselves as needing to elevate the importance of the respective behaviours to the extent that the rest of the respondents expect. The largest differences in effect sizes between the groups was found in the constructs *Engagement and Motivation* (Δ d = 0.82), *Ethics* (Δ d = 0.75), *Communication* (Δ d = 0.68) and *Reliability* (Δ d = 0.63). Project managers in their response did not indicate that any substantial increase in the importance of *Reliability* (d = 0.70) and *Ethics* (d = 0.51) was necessary where the effect sizes were found to be not practically significant.

4.5.3 STRUCTURED INTERVIEWS

Prior to analysis of the questionnaire results, structured interviews were conducted with selected members of the project management organisation considered to be well experienced and knowledgeable in the field of project management. The intent of the interviews was to provide clarification and further insight to the aspects explored via the questionnaire. In addition, interviewees were asked their opinion of the future project management landscape (literature study of Chapter 2) and how project managers might strategize to close competency gaps to ensure future success.

In total six interviews were conducted. Five of the interviewees had in excess of 20 years' experience in the project environment. The interview questions were purposefully limited in number to allow for a short interview period. Interviews typically were 30 minutes in duration. Appendix G contains the transcript of questions asked and answers given by interviewees.

4.5.3.1 FUTURE LANDSCAPE

In Chapter 2 the literature study painted the future global landscape and challenges for project management. During the interviews many of the themes identified in Chapter 2 were touched upon. The majority of interviewees expect that projects will become increasingly complex requiring project managers to deal with and to be able to simplify the complexity to be successful. Being able to get more from limited resources, including people, will be a key skill. Thus people skills, including being able to influence stakeholders, will be imperative for project managers. A critical soft skill that was raised is that of being able to harness diversity

in the project team especially in a working environment that is becoming increasingly virtual. Being comfortable and competent with using technology will be fundamental for all project team members – not only for project managers. Interviewees stressed that project managers would need to build their experience base steadily and not expect to be managing large, complex projects before time.

Interviewees pointed out that in the South African context skills shortage can be expected to continue although these manifest largely in craft labour. Project management is expected to be affected by the retirement of many experienced resources and the "brain-drain" of resources looking to exploit the many favourable opportunities in the global arena. Productivity is a key area to be addressed locally.

4.5.3.2 TOP BEHAVIOURAL COMPETENCIES

Interviewees were provided with a list with definitions of the 16 behavioural constructs of interest in this research study. They were required to rank the top five behavioural competencies they perceive to be the most important for a project manager to be successful ten years from now. Of the 16 constructs the following were highlighted as being the most important: ***Leadership***, ***Values Appreciation***, ***Consultation***, ***Assertiveness*** and ***Reliability***. Five of the six interviewees listed Leadership as the most important competency. The following constructs were not highlighted at all by any of the interviewees: ***Relaxation***, ***Openness***, ***Creativity*** and ***Negotiation***. As a comparison the top five constructs highlighted (shown in green) plus those not listed (shown in purple) by the six interviewees are indicated in Table 19 which contains the construct ranking according to the sample surveyed with the aid of the questionnaire.

Table 19. Comparison of top five constructs highlighted by interviewees

Ranking	Constructs	Cohen's *d* Effect Size
1	Efficiency	1.46
2	Leadership	1.42
3	Creativity	1.41
4	Openness	1.39
5	Engagement and Motivation	1.39
6	Communication	1.36
7	Relaxation	1.35
8	Negotiation	1.35
9	Consultation	1.34
10	Results-orientation	1.33
11	Assertiveness	1.30
12	Self-control	1.25
13	Conflict and Crisis	1.24
14	Reliability	1.23
15	Values Appreciation	1.17
16	Ethics	1.14

Colour legend:

Included in the top five highlighted by interviewees
Not listed at all by interviewees

Inspection of Table 19 shows, with the exception of the construct *Leadership*, there is no significant correlation between the population sample and the six interviewees regarding the importance of the behavioural competencies. It is clear however that *Leadership* is perceived by all as being very important for the success of future project managers.

4.5.4 JOB PROFILES

Audits were conducted on project manager job profiles (from the project management organisation and others) to compare the current make-up required of project managers by the industry. The audit focussed primarily on the soft skills and behavioural competencies required of a typical project manager.

4.5.4.1 PROJECT MANAGEMENT ORGANISATION

The job profile for Project Manager in the project management organisation was reviewed. Competencies are categorised into Functional Competencies, Leadership Competencies, Knowledge, Personal Attributes and General Skills. Functional Competencies comprise mainly of the Contextual and Technical Competencies categorised in the ICB 3.0 (IPMA, 2006). The Knowledge category addressed largely organisational aspects relating to the Functional Competencies although managing others is included. The competencies related to this study are spread across the other three categories, Leadership Competencies, Personal Attributes and General Skills. Competencies required of a Project Manager include leadership, emotional intelligence, teamwork, reliability, ability to work under pressure, ability to work within a diverse culture, ability to work within a changing and ambiguous environment, good interpersonal skills, good communication and presentation skills, ability to motivate and lead direct reports and project teams, stakeholder management and to be proactive. Problem solving, negotiation, and facilitation are included as Functional Competencies.

Some important aspects such as *Ethics* and *Values Appreciation* are not directly addressed although it is possible that they could be implied in terms of legal compliance (and governance) and being able to work within a diverse culture. Aspects such as *Creativity*, *Efficiency* and *Conflict and Crisis* were not observed within the job profile. *Efficiency* and *Creativity* were found to be in the top five in effect size highlighted by the questionnaire results in need of attention by project managers to be successful in the future.

Critically, the job profile reviewed lacks substantial detail regarding the proficiency required in the respective competencies. Proficiency levels are described using the following: “proven”, “good”, “robust”, “ability to …”, “competent in …” and so forth. These proficiency levels are extremely subjective and accurate assessment is difficult. The IPMA utilise a four-point scale (Level D – lowest to Level A – highest) to categorise proficiency levels of effective behavioural competence (IPMA, 2006:84). Lack of detail in assessing competence proficiency levels was highlighted during the structured interviews as a concern and shortcoming which requires attention. These observations are aligned with Pellegrinelli and Garagna (2010:1-2) who contend that many few organisations have competence frameworks based on rigorous research that may be utilised when making appointments or decisions on career progression.

The job profile has limited alignment with the recognised PMBOKs in terms of behavioural competencies. Use of the same or similar descriptions of competencies would allow a common language of benefit to organisations, incumbents and project managers already in the positions.

4.5.4.2 OTHERS

Twenty job profiles for Project Managers in the local and global construction industry were reviewed. Generally speaking, aspects such as communication, teamwork, negotiation, stakeholder relationships, interpersonal skills, leadership, people management, and conflict management are listed in most of the job profiles. Many of the behavioural competencies listed in Table 18 above are not expressly mentioned, e.g. *Creativity*, *Values Appreciation*, *Ethics* and *Relaxation* to name a few. There are numerous examples where competencies are referred to at a very high level, for example “proven leadership”. Again, proficiency levels for behavioural competencies are not detailed making for subjective assessment. Very few job profiles were found to be logically structured to clearly spell out the required competencies. In the majority of cases reliance was made on “a proven track record in….” for functional, technical and behavioural competencies.

It can be concluded that although many job profiles in the industry do address some behavioural competencies for project managers, they are still lacking in many of the areas described in Chapter 3 and need to include a proficiency level for each competency that is based on a logical assessment criteria preferably aligned with one of the PMBOKs such as the IPMA’s ICB 3.0 (2006). Clearly, companies that employ project managers need to elevate the importance given to proficiency in the behavioural aspects required for successful project execution.

4.6 CONCLUSION

The empirical research conducted had as the main objective exploration of the evolution of the behavioural competencies of the future project manager required to be successful in project execution. Based on the literature study performed, a new questionnaire was developed to test the expectations of respondents regarding the evolving importance given by project managers to 16 behavioural competencies determined *a priori* as constructs underlying the research questionnaire. A purposive sampling approach was adopted via electronic deployment of the questionnaire to all members of the population in the project management organisation. It was found that the responses received were representative (in numbers) of the various functions making up the project management organisation and it that meaningful conclusions could be drawn from the data.

The survey results were analysed using SAS (2005) by Statistical Consultation Services of the North West University. Analysis of the Cronbach Alpha values for each of the 16 behavioural competency constructs showed the questionnaire to be reliable. Applying confirmatory factor analysis, the validity of the questionnaire was found to be acceptable and that the constructs determined *a priori* allow an appropriate level of information to be retained when only analysing the constructs.

Using the differences in the means for the **Observed** and **Expected** datasets Cohen's *d* effect sizes were calculated to determine the gap (Observed – Expected) for each of the respective behavioural competence constructs. All effect sizes calculated yielded negative values indicating that in all cases respondents expected greater importance to given to the behavioural competencies in the future by project managers. Rather than trying to interpret the absolute difference in effect sizes between the 16 constructs, a ranking of the constructs according to effect sizes was performed to provide an indication of those respondents perceived to be more important. The constructs which respondents expect to grow in importance for project managers of the future to be successful are ***Efficiency*** (*d* = 1.46), ***Leadership*** (*d* = 1.42), ***Creativity*** (*d* = 1.41), ***Openness*** (*d* = 1.39) and ***Engagement and Motivation*** (*d* = 1.39). The spread between the largest and smallest effect size was found to be 29%. The constructs which respondents expect to be less important in future are ***Ethics*** (*d*= 1.14), ***Values Appreciation*** (*d* = 1.17), ***Reliability*** (*d* = 1.23), ***Conflict and Crisis*** (*d* = 1.24) and ***Self-control*** (*d* = 1.25).

Although the comparison of the perceptions of the various demographic groups highlighted some interesting differences in expectations, perhaps the most notable is the varied perceptions according to the role performed by respondents on projects. Engineering managers indicated comparatively high effect sizes than other respondents for the constructs *Engagement and Motivation*, *Relaxation*, *Openness* and *Creativity*. Project managers were found to perceive themselves as needing to close a smaller gap in the behavioural competencies than that indicated by the grouping of the rest of the respondents. Project managers were aligned with the grouping of all other respondents on the constructs *Self-control* and *Values Appreciation* where similar effect sizes were observed.

Structured interviews with six members of the project management organisation (mostly with project experience exceeding 20 years) yielded results that did not correlate closely with the questionnaire results in terms of the ranking of the importance of the top five behavioural competency constructs. There was consensus regarding the current and future importance of *Leadership* which was indicated as the most important construct by five of the six interviewees. The interviews highlighted that interviewees expected similar challenges for project management as those found in the literature study of Chapter 2, with complexity, doing more with less, harnessing diversity and leveraging technology being the most elevated.

Audits of a number of project manager job profiles yielded that much is still needed to address the behavioural competencies required of project managers to be successful. Many of the competencies are referred to at a high level without necessary detail. The major short coming of the job profiles reviewed is the level of proficiency in the respective competency expected of the project manager.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

The primary objective of this study was to research the expected evolution of project manager behavioural skills and competencies over the next decade. A literature study was performed in Chapter 2 into the future challenges expected for project management setting the context for the literature study in Chapter 3 into the behavioural competencies of project managers. Chapter 4 details the empirical study performed quantitatively using a new questionnaire designed using the behavioural competencies listed in the IPMA ICB 3.0 (2006) as a basis. In Chapter 4 the results of the survey are given. In an attempt to further validate the perceptions of respondents obtained via the questionnaire, a number of structured interviews were conducted. These interviews were discussed in Chapter 4. Additionally, audits were conducted on project manager job profiles from the project management organisation and others in the construction industry. Chapter 4 addresses the audit findings.

This final chapter aims to draw conclusions from the results presented in Chapter 4. Following on from the conclusions, recommendations are offered regarding insights from this research study for organisations and project management professionals. The success of the study is critically evaluated against the primary and secondary objectives that were established in Chapter 1. Recommendations are made for further research endeavours related to the topic of project manager behavioural competencies.

5.2 CONCLUSIONS

The empirical study of Chapter 4 aimed to ***explore*** the perceptions of respondents from a South African project management organisation of how the importance of project manager's behaviours is expected to evolve over the next decade. Conclusions will be drawn for the overall collection of respondents comprising of individuals from various departments and functions throughout the project management organisation who fulfil the requisite roles in project execution. Thereafter, conclusions will be given for the respective demographics making up the sample of respondents.

5.2.1 IMPORTANCE OF BEHAVIOURAL COMPETENCIES

From the empirical study the following behavioural constructs were expected by respondents to grow most in importance in the future (10 years from now) when compared with their observations now: ***Efficiency*** (*d* = 1.46), ***Leadership*** (*d* = 1.42), ***Creativity*** (*d* = 1.41), ***Openness*** (*d* = 1.39) and ***Engagement and Motivation*** (*d* = 1.39).

The behavioural constructs which respondents expect to grow least in importance in the future are: ***Ethics*** (*d* = 1.14), ***Values Appreciation*** (*d* = 1.17), ***Reliability*** (*d* = 1.23), ***Conflict and Crisis*** (*d* = 1.24) and ***Self-control*** (*d* = 1.25).

It is not surprising that respondents expected all of the behavioural constructs to grow in importance in the future. For these "positive" behavioural aspects respondents will expect more when looking forward to the future as opposed to "negative" behavioural aspects where one would expect respondents to indicate differently. The behavioural constructs were based on the behavioural competencies listed in the IPMA's ICB 3.0 (2006) which does not include any "negative" or "limiting" competencies.

With the exception of *Values Appreciation*, the behavioural constructs expected to grow least in importance, are probably considered well-entrenched in the project management organisation by respondents and they expect that it will continue to be so in the future. *Ethics* in particular has received much attention recently both at an organisational and national level. *Reliability*, *Self-control* and *Conflict and Crisis* can also be seen as base behavioural competencies that project managers must have as a minimum. The project management organisation in the research study initiated a values driven leadership program about four years ago which is still on-going. This could explain the expectation that *Values Appreciation* will not grow significantly in importance in future but will remain a focus area.

In general, the behavioural constructs expected by respondents to grow most in importance in future, tend to align well with those highlighted by the literature study into the future challenges for project management (Chapter 2) and the behavioural competencies of project managers (Chapter 3).

The IPMA (2006:108) views *Efficiency* as the most basic component of project management embracing methods, systems and procedures as effectively as possible. Heerkens (2002:26-27) includes efficiency as one of four aspects that should be assessed when determining the success of any project. This relates to how well a project was managed. *Efficiency* will be fundamentally important for project managers (and project teams) to manage resources effectively so that more can be achieved with less. Given the rapidly changing, dynamic and complex environment in which projects are executed, project managers will not have the luxury to refine processes and methodologies from project to project. They will need to determine the most efficient for each project. As is indicated by many authors in the literature *Efficiency* includes many aspects such as project teams, diversity of resources (generations, culture, etc.), virtual working environments, knowledge management, embracing technology and recruiting the right skills.

The IPMA (2006:86) describes *Leadership* as the single mechanism for the project manager to apply all of his competencies to the project and the team. *Leadership* is essential when the project is faced with problems and when there is change or uncertainty. Bisoux (2005:42) reminds us that leadership requires practise. Leadership is learned experientially by trial and error not only in the classroom or by reading. This was reiterated during the structured interviews in that project managers require coaching and mentoring in addition to opportunities with increasing responsibility to develop as leaders.

Bucero (2004:22) highlights that project management traditionally is mostly a left-brain activity and that project managers should embrace creativity to the advantage of the project. Given the expectations of respondents regarding *Creativity*, they expect of project managers to leverage *Creativity* during projects not only in terms of opportunities but also in problem solving and leading the team. Respondents may also be observing a lack of optimism in project managers. Dolfi and Andrews (2007:681) found that optimism, an aspect required for creativity, is an important attribute for all project managers.

As pointed out by the IPMA (2006:98), *Openness* distils down to the ability of the project manager to make team members comfortable to express themselves. Respondents expect *Openness* to grow in importance in the future indicating that generally there is some reluctance to totally open expression. Dzenowagis (2010:4) indicates that project managers of the future will need to have cultural intelligence (CQ) to enable communication with team members at a deeper level assisting with creating inspiration, influencing and innovation.

Thus respondents expect of project managers in future to give higher importance to embracing diversity, being more receptive to new ideas and team members who are different.

Linking in with *Efficiency*, respondents raised the expectation that more importance needs to be afforded in future by project managers to *Engagement and Motivation*. The IPMA (2006:90) states that good working relationships and increased productivity at all levels result when engagement and motivation of the project team is achieved. Respondents expect project managers to do more in future such that project participants achieve the "deep connection with the project…and become inspired into action" as put forward by Sense and Fernando (2010:504).

5.2.2 COMPARISON OF DEMOGRAPHIC VARIABLES

Exploring the respective demographic variables, to establish if the demographics of respondents influences their perception of the future behavioural skills and competencies required of project managers, was identified as one of the secondary objectives of the research study. This was achieved by comparing the effect sizes for the differences in the means for the Observed and Expected datasets for each of the 16 behavioural constructs across the following demographics: **Gender**, **Age**, **Highest Qualification**, **Years in Project Environment**, **Monetary Value of Projects** and **Role**.

Taking heed of Steyn's (2001:1) warning that one should proceed with caution regarding the extent of the differences in effect sizes unless one has a feeling for the scale used, some of the more interesting differences in perceptions of the future are discussed.

In an organisation of predominantly male employees, female respondents differed by perceiving greater importance needed to be given by project managers to *Efficiency*, *Ethics* and *Communication*.

When comparing the expectations for the **Age** demographic, respondents in the **30 to 29 years** group indicated noticeably larger expectations of the importance of all the behavioural constructs with the exception of *Self-control* (largest = **50 to 59 years**) and *Relaxation* (largest = **60 years and above**). This could possibly be explained by the competitive nature of those in the **30 to 39 years** age category who, in the prime of their career, still have high

expectations and are very critical regarding the performance of others. They indicate that the largest gap exists in the *Leadership* construct. Those above 50 years of age are expecting more *Self-control* of project managers and *Relaxation* which makes a lot of sense given where they find themselves in their careers.

No significant conclusions could be drawn from the comparison of groups according to their **Highest Qualification** achieved. Two of the groups, **Matric Certificate** and **Doctorate**, were small in size yielding some results that were not statistically significant.

Similarly, when analysing the **years of experience in the project environment** of respondents, effect sizes tended to be similar. Those with **5 or less years** in the project environment generally yielded smaller effect sizes than the others. This could be that they have not yet had sufficient exposure to formulate an informed decision – perhaps they are working on their first or second project only. The respective groups showed very close alignment in their expectations regarding the following constructs where effect sizes differed minimally between groups: *Engagement and Motivation*, *Efficiency*, *Negotiation*, *Conflict and Crisi*s and *Communication*. Of these, *Efficiency* was the most aligned between the groups.

Regarding the size of projects worked on in terms of monetary value, the five respective demographic groups tended towards a grouping of two: **projects less than and greater than R100 million**. This could possibly be explained by the level of project manager assigned to the respective groupings of projects. For projects greater than R100 million in value, project managers tend to be more experienced and skilled in the behavioural competencies of interest to this research study. Respondents associated with projects of R100 million or more in value indicated higher effect sizes in general for all the behavioural constructs. Of these, *Leadership*, *Creativity*, *Efficiency* and *Ethics* were found to have large effect sizes.

Of all the comparisons of the respective demographics, that of the **Role** fulfilled on projects was the most remarkable. When **project managers** were compared against a grouping of all the other respondents, **project managers** perceived less of a gap in the importance needed to be afforded in future to all of the behavioural competencies. One could argue that this is to be expected however project managers should take note of the perceptions of the larger group. There was alignment regarding the constructs *Self-control* and *Values Appreciation* where similar effect sizes were observed. The largest differences in effect

sizes between the groups were for the constructs *Engagement and Motivation* (Δ *d* = 0.82), *Ethics* (Δ *d* = 0.75), *Communication* (Δ *d* = 0.68) and *Reliability* (Δ *d* = 0.63). For the group of project managers, the effect sizes of *Reliability* (*d* = 0.70) and *Ethics* (*d* = 0.51) were found to be not practically significant. This means that project managers do not expect any significantly greater importance needed to be given to *Reliability* or *Ethics* in future than is given now. Project managers possibly take the view that these two constructs are really fundamental and a given for the project management professional without which one cannot continue to operate and the system will soon eliminate such individuals. **Engineering managers** were found to have high effect sizes for the constructs *Engagement and Motivation* (*d* = 2.03), *Relaxation* (*d* = 2.08), *Openness* (*d* = 1.78) and *Creativity* (*d* = 1.77). The role of the engineering manager in complementing the project manager to lead project team members needs to be studied further. Although the project manager is accountable overall for project delivery, the engineering manager plays a major role opposite the engineering team which comprises a significant portion of the project team in construction projects.

Knowledge of the differing expectations amongst the demographic variables of the importance of the behavioural competencies of project managers allows for organisational initiatives to be customised and directed towards specific demographic groups.

5.2.3 AUDIT OF PROJECT MANAGER JOB PROFILES

In Chapter 4 an audit was conducted on the job profile for Project Manager in the project management organisation. Thereafter a number of project manager job profiles from the construction industry across the globe were reviewed. While there is evidence that organisations have started to include the behavioural competencies and skills required of project managers, there is still much work to be done in this regard.

The job profile for Project Manager reviewed from the project management organisation, although the most comprehensive of all reviewed, still is lacking in requiring of project managers the behavioural competencies as listed in the IPMA ICB 3.0 (2006). In addition, proficiency levels required are subjective with terms such as “good”, “robust” and “sound” being used to describe competency levels. Knowing which behavioural competences are required and to what degree (i.e. proficiency) is essential for organisations when appointing project managers. Spencer and Spencer (1993:11) point out that ultimately an organisation

should select for behavioural competencies rather than to develop them which is time consuming and often difficult. In most cases, organisations expect of project managers to be able to perform the work from the start without an extensive training period. Organisations should also be able to differentiate between knowledge and skill. When recruiting project managers it is more important to be able to assess the behavioural skills of the individual rather than the knowledge the incumbent has of the topic. Goff (2006:1) asserts that knowledge only becomes a skill through appropriate experience. Crawford (2005:8-9) highlights that in addition to assessing the skills of a project manager, it is important to determine and assess the core personality traits of the individual. The core personality traits are those underlying a person's capability to perform a specific job. Bedingfield and Thal (2008:1303) stress that the behavioural attributes of people are very difficult to measure. It is likely for this reason that organisations utilise subjective proficiency requirements in the project manager job profiles and rely extensively on feedback from others (e.g. intensive interviews, references, demonstrated completion of projects by the incumbent) in making an assessment of the makeup and capability of the person. Organisations often try to overcome this risk by "growing their own timber" and developing people from within the organisation rather than recruiting from outside.

There is some misalignment regarding the terminology used by organisations to describe the required project manager behavioural competencies. Terms such as Leadership are used which can still have a generalised meaning. Pellegrinelli and Garagna (2010:1-2) advise that organisations adopt competence frameworks based on rigorous research which may be drawn upon when making appointments or decisions on career progression. Alignment with recognised competence frameworks from research studies or from PMBOKs allows a common language and a basis for assessment that is less likely to be subjective.

5.3 RECOMMENDATIONS

Based on the conclusions discussed in the sections above the following recommendations are offered:

a) Those associated with projects, especially those responsible for the training and development of project managers, should take on-board the expectations of respondents regarding the growing importance of the behavioural competencies ***Efficiency***, ***Leadership***, ***Creativity***, ***Openness*** and ***Engagement and Motivation***.

Project managers need to become more proficient in these competencies however without neglecting the others. To be successful in the art and science of projects, a complete spectrum of proficiency is required in all behavioural competencies. Formal education and development activities for project managers must include behavioural competencies.

b) Organisations need to review their current job profiles and career paths for project managers. Job profiles should include behavioural competency frameworks that are based on rigorous research that forms the basis for assessment of proficiency in the respective competence elements. Some alignment with the respective PMBOKs is recommended especially with the IPMA ICB 3.0 (2006) which currently addresses behavioural competencies most completely when compared with the other PMBOKs.
c) Many behavioural competencies are learned experientially. Thus organisations need to assign the appropriate project to individual project managers such that they are continually developing throughout their careers. Ideally, assessment of proficiency across the entire spectrum of project management competencies, not only behavioural competencies, should be performed at the completion of every project or at least after a defined time period and built into the project manager's development plan for the future.
d) Minimal research has been conducted into the future behavioural competencies required of project managers to execute projects successfully. It is recommended that further research is continued as this dynamic topic will drive efficiency of project execution.

5.4 EVALUATION OF THE STUDY

The determination of the success of the study depends on a critical evaluation of the achievement of the primary and secondary objectives as detailed in Section 1.4 of Chapter 1.

5.4.1 PRIMARY OBJECTIVE

The main objective of the study was to research the evolution of project manager behavioural skills and competencies over the next decade and to answer the following questions:

- What project manager behavioural skills and competencies will be required for successful project execution?
- How will project manager skills and competencies change from the current basis published by the IPMA (in version 3 of the International Competence Baseline)? Which will grow in importance and which will diminish?

To gain an appreciation of the project manager behavioural skills and competencies required for successful project execution a literature study was conducted, firstly regarding the future challenges expected for project management (Chapter 2) and, secondly into the behavioural competencies applicable to project managers (Chapter 3). Exploring how the project manager behavioural skills and competencies will change, as listed in version 3 of the IPMA's International Competence Baseline, was achieved by means of the empirical study with the findings being discussed in detail in Chapter 4.

5.4.2 SECONDARY OBJECTIVES

The secondary objectives of the study were:

- To establish if the demographics (for example age, experience) of responding project management professionals influences their perception of the future behavioural skills and competencies of project managers.
- To evaluate the importance of leadership skills required for successful project execution.
- To compare the required future behavioural skills and competencies of project managers against current job profiles for project management professionals in the construction industry in South Africa.

The secondary objective of establishing if the demographics of responding project management professionals influences their perception of the future behavioural skills and competencies of project managers was achieved as part of the empirical study performed and detailed in Chapter 4.

The evaluation of the importance of leadership skills required for successful project execution was completed by way of the literature study performed in Chapter 3 and the empirical study, including structured interviews, contained in Chapter 4.

Using the results and analysis of the empirical study, the secondary objective to compare the required future behavioural skills and competencies of project managers against current construction industry job profiles was achieved.

Thus all of the secondary objectives for the research study were achieved as intended.

5.5 LIMITATIONS OF THE STUDY

The research study, given the scope and time allowed for a mini-dissertation, was limited to the perceptions of project management professionals in a single South African project management organisation in the construction industry regarding the behavioural skills and competencies of project managers in the future.

5.6 SUGGESTIONS FOR FURTHER RESEARCH

Using this research study as a basis, the following suggestions for further work are suggested:

- While possibly beyond the scope of a mini-dissertation, extending the research beyond a single project management organisation, first on a national level and then on a global level, would be of interest to the project management fraternity and those involved with education of project management professionals. Other extensions of scope might include industries other than the construction industry, inclusion of functional competencies in addition to the behavioural competencies and scenario planning.
- Although this study focussed on the perceptions regarding the behavioural skills and competencies required in the future of project managers to be successful, there are clearly gaps currently in these competencies that have been highlighted. Further work could investigate these current behavioural competency gaps in more detail and

formulate a strategy for both individuals and project management organisations to close the gaps.

- Research is lacking in terms of which project manager behavioural competencies (including the level of proficiency) are predictors of project success. This insight would be invaluable when recruiting project managers.
- As an extension to the bullet above, research is needed to gain a holistic view of competencies (and proficiency levels), technical, behavioural and contextual, that are the makeup of a successful project manager for varying categories of projects (small to giga projects).
- The work done by Toor and Ofori (2008) regarding the success of authentic project leaders when managing projects can be further developed. Project leadership is a topic likely to receive much attention by scholars in the coming years.
- Research is needed into the contribution and impact of the engineering manager in terms of behavioural competencies when utilised on construction industry projects. Working in conjunction with the project manager in a leadership role, the engineering manager has a significant role to play in affecting project outcomes.

5.7 OVERALL CONCLUSION

As the primary objective, this study set out to *explore* the evolution of the behavioural competencies and skills expected of project managers over the next decade to be successful in directing project teams to deliver required outcomes. The results of the quantitative study highlighted that the following behavioural constructs are expected by respondents to be given more importance by project managers in future than they are now: ***Efficiency***, ***Leadership***, ***Creativity***, ***Openness*** and ***Engagement and Motivation***. Those behavioural constructs expected by respondents to grow least in importance are: *Ethics*, *Values Appreciation*, *Reliability*, Conflict and Crisis and *Self-control*. Analysis of the expectations of the respective demographic variables highlighted a number of interesting differences which were discussed in this chapter. Conclusions regarding the audits conducted on Project Manager job profiles were given. Importantly, organisations need to give attention to how behavioural competencies are addressed and how proficiency is measured.

Recommendations, based on the study findings, were offered for organisations looking to further develop project manager behavioural competencies.

The research study was critically evaluated against the primary and secondary objectives set in Chapter 1. The study was found to be successful with both the primary and secondary objectives being achieved.

In the interest of further research work relating to the topic of project manager behavioural competencies and how they are expected to evolve in the future, a number of recommendations were made.

REFERENCES

ALAM, M., GALE, A., BROWN, M. & KIDD, C. 2008. The development and delivery of an industry led project management professional development programme: A case study in project management education and success management. *International Journal of Project Management*, 26(2008):223-237, Dec. Available ScienceDirect.

ALEXANDER, T., CALDWELL, J., GONZALEZ, M., HARVEY, D., NYE, B., RODGERS, C. & WASHER, A. 2010. The role of emotional intelligence (EI) in project management over the next five years. A white paper – February 2010. 14 p. Available from www.organizationacceleration.com/EI_White_Paper.pdf Date of access: 1 May 2011.

APM (Association for Project Management). 2006. APM body of knowledge. 5th ed. Buckinghamshire: Association for Project Management. 179 p.

ASGARY, N. & THAMHAIN, H.J. 2008. Effective leadership for culturally diverse technology projects. (*In* PICMET 2008 Proceedings: Papers read at PICMET held in Cape Town, South Africa from 27 to 31 July 2008. p 1345-1349.)

BALLOW, D.G. 2004. Globalization and cross-cultural issues in project management. *Project Management Knowledge Transfer*. 5 p. Available from www.asapm.org/asapmag/articles/GlobalizPM.pdf Date of access: 15 May 2011.

BARBER, E. & WARN, J. 2005. Leadership in project management: from firefighter to firelighter. *Management Decision*, 43(7/8):1032-1039, Jul. Available Emerald.

BARNES, M. 2002. A long term view of project management – its past and likely future. (*In* Proceedings of IPMA 16th World Congress on Project Management held in Berlin, Germany on 5 June 2002.) Available from www.pmforum.org/library/papers/2002/longtermpm_barnes.pdf Date of access: 24 April 2011.

BARROW, R. 1987. Skill talk. *Journal of the Philosophy of Education*, 21:187-201.

BARRY, T.R. 2010. Top 10 qualities of a project manager. *Project Smart*. 3 p. Available from www.projectsmart.co.uk/top-10-qualities-project-manager.html Date of access: 1 May 2011.

BEARD, S. 2005. Soft skills for the global project manager. Paper read at AIPM National Conference held in Melbourne, Australia from 9 to11 October 2005. 9 p. Available from http://cms.3rdgen.info/3rdgen_sites/107/resource/Beard-AIPMconf05.pdf Date of access:1 May 2011.

BEDINGFIELD, J.D. & THAL, A.E. Jr. 2008. Project manager personality as a factor of success. (*In* PICMET 2008 Proceedings: Papers read at PICMET held in Cape Town, South Africa from 27 to 31 July 2008. p 1303-1314.)

BELZER, K. 2001. Project management: still more art than science – a paper. 6 p. Available from www.pmforum.org/library/papers/2001/ArtthanScience.pdf Date of access 25 April 2011.

BISOUX, T. 2005. What makes leaders great. *Biz Ed Magazine*. September/October. p 40-45. Available from www.aacsb.edu/publications/archives/sepoct05/p40-45.pdf Date of access: 26 April 2011.

BLOOM, M.R. & KITAGAWA, K. 1999. Understanding employability skills. 257-99 Report, The Conference Board of Canada, Ottawa, Ontario, Canada. 24 p. Available from www.accc.ca/ftp/es-ce/257_99.pdf Date of access: 11 December 2010.

BOULEY, J. 2007. Standing on principle: PMI unveils a revised code of conduct to meet the needs of a global profession. *Modern Ethics – A supplement to PM Network*, 21(1):2-7, Jan.

BOURNE, L. 2005. The accidental project manager – the getting of wisdom. Paper read at the Project Management Institute New Zealand Annual Conference 2005, held in Auckland, New Zealand from 13 to 14 October 2005. 12 p. Available from www.mosaicprojects.com.au/PDF_Papers/P036_The%20Accidental%20PM.pdf Date of access: 8 May 2011.

BOWLES, M. 2011. Caution: cultures crossing – emotional intelligence meet cultural awareness. *PM Network*, 25(1):58-63, Jan.

BOYATZIS, R.E. 1982. The competent manager: A model of effective performance. New York: John Wiley and Sons. 311 p.

BRILL, J.M., BISHOP, M.J. & WALKER, A.E. 2006. The competencies and characteristics of an effective project manager: a web-based Delphi study. *Educational Technology Research and Development*, 54(2):115-140.

BUSCH, J.S. 2008. Project delivery problems: Why can't we make them go away? (*In* PICMET 2008 Proceedings: Papers read at PICMET held in Cape Town, South Africa from 27 to 31 July 2008. p 1410-1422.)

BUCERO, A. 2004. Smart emotions. *PM Network*, 18(11):22, Nov.

COHEN, J. 1988. Statistical power analysis for the behavioural sciences. 2nd ed. Hillsdale, New Jersey: Lawrence Erlbaum Associates. 567 p.

CRAWFORD, L. 2005. Senior management perceptions of project management competence. *International Journal of Project Management*, 23(2005):7-16, Jan. Available ScienceDirect.

CRONBACH, L.J. 1951. Coefficient alpha and the internal structure of tests. *Psychometrika*, 16(3):297-334.

CRONBACH, L.J. & SHAVELSON, R.J. 2004. My current thoughts on coefficient alpha and successor procedures. *Educational and Psychological Measurement*, 64(3):391-418, Jun.

DAVIS, A. & BLASS, E. 2007. The future workplace: views from the floor. *Futures*, 39(1):38-52. Available from https://uhra.herts.ac.uk/dspace/bitstream/2299/5144/1/901032.pdf Date of access: 20 April 2011.

DOLFI, J. & ANDREWS, E.J. 2007. The subliminal characteristics of project managers: an exploratory study of optimism overcoming challenge in the project management work environment. *International Journal of Project Management*, 25(7):674-682, Oct. Available ScienceDirect.

DOMBKINS, D. 2009. Redefining our profession Part 2: The history and future of project management. *PM World Today*. February 2009. Vol XI, Issue II. 21 p. Available from www.pmworldtoday.net Date of access: 23 April 2011.

DUGGAL, J. 2001. Building a next generation PMO. (*In* Proceedings of the Project Management Institute Annual Seminars & Symposium 2001: Papers read at the PMI Annual Seminars and Symposium held in Nashville, Tennessee, USA from 1 to 10 November 2001.). 4 p. Available from http://search.pmi.org/Default.aspx?q=%22Project%20Management%20(PM)--Forecasting.%22 Date of access: 2 April 2011.

DULEWICZ, V. & HIGGS, M. 2003. A new approach to assessing leadership dimensions, styles context. *Competency and Emotional Intelligence Quarterly*, 11(2):224-232.

DULEWICZ, V. & HIGGS, M. 2005. Assessing leadership styles and organisational context. *Journal of Managerial Psychology*, 20(2):105-123, Feb. Available Emerald.

DWIVEDULA, R. & BREDILLET, C.N. 2010. Profiling work motivation of project managers. *International Journal of Project Management*, 28(2):158-165, Feb. Available ScienceDirect.

DZENOWAGIS, A. 2010. Leverage your cultural intelligence (CQ) in project performance. (*In* PMIZ National Conference 2010 Proceedings: Papers read at the PMIZ National Conference held in Wellington, New Zealand from 24 to 26 August 2010.). 4 p. Available from www.pminzconference.com/assets/papers/ADzenowagis_Cultural_Intelligence.pdf Date of access: 1 May 2011.

ELLIS, P.D. 2010. The essential guide to effect sizes – Statistical power, meta-analysis and the interpretation of research results. New York: Cambridge University Press. 173 p.

ELLIS, S.M & STEYN, H.S. 2003. Practical significance (effect sizes) versus or in combination with statistical significance (p-values). *Management Dynamics*, 12(4):51-53.

EL-SABAA, S. 2001. The skills and career path of an effective project manager. *International Journal or Project Management*, 19(1):1-7, Jan. Available Elsevier.

ENSWORTH, P. 2003. The accidental project manager: QA to the rescue. Paper read at the American Society for Quality 13th International Conference on Software Quality held in Dallas, Texas in October 2003. Available from www.harborlightmanagement.com/Presentations/ICSQ%20APM%20-%20QA%20to%20the%20Rescue.pdf Date of access: 1 May 2011.

FERRARO, J.P. 2005. Three personal competencies you need to get more out of your PMP. 36 p. Available from www.myprojectadvisor.com Date of access: 25 April 2011.

FIELD, A. 2009. Discovering statistics using SPSS. 3rd ed. London: Sage Publications. 821 p.

FISTER GALE, S. 2008. Pay attention. *PM Network*, 22(6):36-39, Jun,

FLANNES, S. 2004. Effective people skills for the project manager: a requirement for project success and career advancement. (*In* Proceedings of the Twenty-Ninth Annual SAS Users Group International Conference: Papers read at the Twenty-Ninth Annual SAS Users Group International Conference held in Montreal, Canada on 12 May 2004. Paper 131-29.), 20 p.

FRETTY, P. 2006. Project management 2.0. *PM Network*, 20(7):38-44, Jul.

FRANKLIN, C.R., JABNOUN, N. & DHARWADKAR, S.R. 2009. Project Management in the Arabian Gulf Region, circa 2025. (*In* Cleland, D. & Bidanda, B., eds. 2009. Project management circa 2025. Pennsylvania: Project Management Institute. p 101-115.)

GERALDI, J.G., LEE-KELLEY, L. & KUTSCH, E. 2010. The Titanic sunk, so what? Project manager response to unexpected events. *International Journal of Project Management*, 28(6):547-558, Aug. Available ScienceDirect.

GEORGE, B. SIMS, P., McLEAN, A.N. & MAYER, D. 2007. Discovering your authentic leadership. *Harvard Business Review*, 85(2):129-138, Feb.

GILLARD, S. 2009. Soft skills and technical expertise of effective project managers. *Issues in Informing Science and Information Technology*, 6(2009):723-729, Jan.

GOFF, S. 2006. Distinguishing PM competence in training and development, organizational assessment and certification. 7 p. Available from www.asapm.org/asapmag/articles/PMCompetence.pdf Date of access: 25 April 2011.

GOFF, S. 2008. Finding, developing and managing project talent: In today's top enterprises, everyone's a talent scout. 5 p. Available from www.asapm.org/asapmag/articles/DevelopingTalent.pdf Date of access: 25 April 2011.

GOH, S., COAKER, W. & BULLEN, F. 2008. Management education for the 21st century Engineering Manager: An Australian perspective. (*In* Proceedings of the 38th ASEE/IEEE Frontiers in Education Conference: Papers read at the 38th ASEE/IEEE Frontiers in Education Conference held in Saratoga Springs, N.Y., USA from 22 to 25 October 2008. S2E1-5.)

GOULD, M. & FREEMAN, R. 2003. The art of project management: A competency model for project managers. Boston University: Corporate Education Centre. 11 p. Available from www.logixsource.com/Weblinks/ProjectManagement.pdf Date of access: 30 April 2011.

GOLEMAN, D. 1998. Working with emotional intelligence. New York: Bantam. 400 p.

GRATTON, L. 2010. The future of work. *Business Strategy Review*, 21(3):16-24, Sep.

HARGROVES, K. & SMITH, M.H., eds. 2005. The natural advantage of nations: Business opportunities, innovation and governance in the 21st century. London: Earthscan. 527 p.

HARTMAN, F. 2008. Preparing the mind for dynamic management. *International Journal of Project Management*, 26(2008):258-267, Apr. Available ScienceDirect.

HEERKENS, G.R. 2002. Project Management. New York: McGraw-Hill. 250 p.

HELGADOTTIR, H. 2008. The ethical dimensions of project management. *International Journal of Project Management*, 26(7):743-748, Oct.

HOGAN, R. & KAISER, R.B. 2005. What we know about leadership. *Review of General Psychology 2005*, 9(2):169-180, Jun.

HONGMIN, L. 2009. Project management team strategy in a global environment. (*In* Proceedings of the International Colloquium on Computing, Communication, Control and Management Proceedings: Papers read at the International Colloquium on Computing, Communication, Control and Management held in Sanya, China from 8 to 9 August 2009. p 169-172.). Available IEEE.

HOWE, J. 2006. The rise of crowdsourcing. *Wired*. Available from www.wired.com/wired/archive/14.06/crowds_pr.html Date of access 25 April 2011.

HUCK, S.W. 2012. Reading statistics and research. 6th ed. Boston, M.A.: Pearson Education. 566 p.

HUDSON, K., GRISHAM, T., SRINIVASAN, P. & MOUSA, N. 2005. Conflict management, negotiation, and effective communication: essential skills for project managers. (*In* Proceedings of the Australian Institute of Project Management National Conference: Papers read at the Australian Institute of Project Management National Conference held in Melbourne, Australia from 9 to 11 October 2005.). 12 p. Available from http://thomasgrisham.com/attachments/File/Conflict_Management_AIPM_Australia.pdf Date of access: 8 May 2011.

IPMA (International Project Management Association). 2006. International Competence Baseline Version 3.0. Nijkerk: International Project Management Association. 200 p.

IRELAND, L. 2007. Technical performance and interpersonal skills in the project's staff. PrezSez 04-2007. 3 p. Available from http://www.asapm.org/asapmag/articles/PrezSez04-07.pdf Date of access 26 April 2011.

IRELAND, L. 2008. Future trends in project management. PrezSez 08-2008. 4 p. Available from www.asapm.org/asapmag/articles/PrezSez08-08.pdf Date of access: 24 April 2011.

JIANG, D. & PRETORIUS, L. 2010. Communication behaviour in international engineering projects: an empirical and comparative study between South Africa and China. (*In* PICMET 2010 Proceedings: Papers read at PICMET 2010 held in Phuket, Thailand from 18 to 22 July 2010. p 2449-2456.). Available IEEE.

JUGDEV, K., MULLER, R. & HUTCHISON, M. 2009. Future trends in project management: a macro-environmental analysis. (*In* Cleland, D. & Bidanda, B., eds. 2009. Project management circa 2025. Pennsylvania: Project Management Institute. p 229-252.)

KINOSHITA, S. & PLAISTOWE, F. 2009. Generations in the workplace. Information Processing Management Association 2009 Executive Seminar, 30 September 2009. Available from www.ipma-wa.com/exec_sem/2009/Generations.pdf Date of access 26 April 2011.

KLOPPENBORG, T.J. & PETRICK, J.A. 1999. Leadership in project life cycle and team character development. *Project Management Journal*, 30(2):8-13, Jun.

LECOMBER, A.J. & ASUMADU, K. 2005. Future dilemmas: Do we need socially and ecologically responsible project management competencies? Paper read at the AIPM National Conference held in Melbourne, Australia from 9 to11 October 2005. Melbourne, Australia. 9 p. Available from www.aipm.com.au/resource/Lecomber-AIPMconf05.pdf Date of access: 26 April 2011.

LEE, M.R. 2009. E-ethical leadership for virtual project teams. *International Journal of Project Management*, 27(5):456-463, Jul. Available ScienceDirect.

LEVINE, D.M., STEPHAN, D.F., KREHBIEL, T.C. & BERENSON, M.L. 2008. Statistics for managers using Microsoft Excel. New Jersey: Pearson Prentice Hall. 858 p.

LIN, L., WEI, Y. & FEI, C. 2007. Relation of the project manager leadership and performance. (*In* Proceedings of the International Conference on Wireless Communications, Networking and Mobile Computing: Papers read at the International Conference on Wireless

Communications, Networking and Mobile Computing held in Shanghai, China from 21 to25 September 2007. p 5244-5247.). Available IEEE.

LLOYD-WALKER, B. & WALKER, D. 2011. Authentic leadership for 21st century project delivery. *International Journal of Project Management*, 29(4):383-395, May. Available ScienceDirect.

MARR, B., SCHIUMA, G. & NEELY, A. 2004. Intellectual capital – defining key performance indicators for organisational knowledge assets. *Business Process Management Journal*, 10(5):551-569.

MATHUR, G., JUGDEV, K. & FUNG, T.S. 2007. Intangible project management assets as determinants of competitive advantage. *Management Research News*, 30(7):460-475, Jul. Available Emerald.

MCKAY, K. 2008. PM politics 101: The secret of getting things done. Presentation to PMI Society Greater Toronto on 18 September 2008. 47 p. Available from www.gtislig.org/DinnerEvent200809/PM_Politics_101.pdf Date of access: 2 May 2011.

MIRABILE, R. 1997. Everything you wanted to know about competency modelling. *Training and Development*, 51(8):73-99, Aug.

MENGEL, T. 2005. Wisdom and knowledge – leadership in balance. *Integral Consulting*. 8 p. Available from www.meaning.ca/archives/archive/pdfs/mengel_wisdom.pdf Date of access: 2 May 2011.

MERRIAM-WEBSTER DICTIONARY. 2011. Crowdsourcing. Available from www.merriam-webster.com/dictionary/crowdsourcing Date of access: 25 April 2011.

MULLER, R. & TURNER, R. 2010. Leadership competency profiles of successful project managers. *International Journal of Project Management*, 28(5):437-448, Jul. Available ScienceDirect.

MURRAY-WEBSTER, R. HILLSON, D. 2002. Scaling the PEAKS of project management competency. Paper read at PMI Europe 2002, The Project Management Festival held in

Cannes, France from 19 to 20 June 2002. 8 p. Available from http://test.risk-doctor.com/pdf-files/pks0602.pdf Date of access: 10 May 2011.

OED (OXFORD ENGLISH DICTIONARY). 2010. Skill. Available from www.oxforddictionaries.com/definition/skill?view=uk Date of access: 11 December 2010.

PANT, I. & BAROUDI, B. 2008. Project management education: the human skills imperative. *International Journal of Project Management*, 26(2008):124-128, Feb. Available ScienceDirect.

PELLEGRINELLI, S. & GARAGNA, L. 2010. Facilitating selection and development: The case of the "Accidental Professionals" – project and programme managers. (*In* Proceedings of the IPMA World Congress: Papers read at the IPMA World Congress held in Istanbul, Turkey from 1 to 3 November 2010.) Available from www.intoconsulting.it/upload/download/foto/Pellegrinelli_Garagna_2010_IPMA.pdf Date of access: 1 May 2011.

PENG, G., JUNWEN, F. & HUATING, W. 2007. Development and comparative analysis of the project management bodies of knowledge. *Management Science and Engineering*, 1(1):106-111, Sept.

PENNYPACKER, J.S. 2009. Project portfolio management circa 2025. (*In* Cleland, D. & Bidanda, B., eds. 2009. Project management circa 2025. Pennsylvania: Project Management Institute. p 215-226.)

PETERS, T. 2004. Nix the spreadsheet. *PM Network*, 18(1):19, Jan.

PETTY, A. 2009. Leadership and the project manager. *Management Excellence*. 33p. Available from http://artpetty.com/wp-content/uploads/2009/05/ldrshipandprojmgrfinal.pdf Date of access: 25 April 2011.

PINKOWSKA, M. & LENT, B. 2011. Evaluation of scientific and practice approaches to soft skills requirements in the ICT project management. *IBIMA Business Review Journal 2011*. 12 p. Available from www.ibimapublishing.com/journals/IBIMABR/2011/318867/318867.pdf Date of access: 10 May 2011.

PINTO, J.K. & KHARBANDA, O.M. 1995. Lessons for an accidental profession. *Business Horizons* (March/April). p 41-50.

PMI (PROJECT MANAGEMENT INSTITUTE). 2008. A guide to project management body of knowledge. 4th ed. Newtown Square, P.A.: Project Management Institute. 467 p.

POLLACK, J. 2007. The changing paradigms of project management. *International Journal of Project Management*, 25(2007):266-274, Apr. Available ScienceDirect.

POURDEHNAD, J. 2007. Synthetic (integrative) project management: an idea whose time has come. *Business Strategy Series*, 8(6):426-434. Available Emerald.

QUINN, J.F. & WILEMON, D. 2009. Emotional intelligence as a facilitator of project leader effectiveness. (*In* Proceedings of Portland International Conference on Management of Engineering & Technology: Papers read at PICMET 2009 held in Portland, Oregon from 2 to 6 August 2009. p 1267-1275.)

RACINE, J. 2008. Behavioural competence elements and influencing. (*In* IPMA Expert Seminar 2008 Proceedings: Papers read at IPMA Expert Seminar 2008 held in Zurich, Switzerland from 14 to 16 February 2008. p 101-107.)

RASMUS, D.W. 2007. The next-generation workforce and project management. *ASK Magazine (NASA)*. p 30-33. Available from http://askmagazine.nasa.gov/issues/28/28i_next_generation.html Date of access: 25 April 2011.

RAVID, R. 2011. Practical statistics for educators. 4th ed. Plymouth: Rowman and Littlefield Publishers Inc. 256 p.

SAS Institute Inc. 2005. SAS/STAT, Release 9.1, Cary, N.C.: SAS Institute.

SCASE, R. 2006. The West needs to find a new HR compass. *Employee Benefits*, December 2006. p 16, Available from www.richardscase.com/articles?art=69 Date of access: 25 April 2011.

SCHREIBER, J.B., NORA, A., STAGE, F.K., BARLOW, E.A. & KING, J. 2006. Reporting structural equation modelling and confirmatory factor analysis results: a review. *The Journal of Educational Research*, 99(6):323-337, Jul.

SENSE, A. & FERNANDO, M. 2010. The spiritual identity of projects. *International Journal of Project Management*, 29(5):504-513, Jul. Available ScienceDirect.

SILVIUS, A.J.G. 2008. Project Management 2027: The future of project management. (*In* Proceedings of 22nd IPMA World Congress: Papers read at 22nd IPMA World Congress held in Rome, Italy from 9 to 11 November 2008.) 6 p. Available from www.gilbertsilvius.nl/Paper%20IPMA%202008%20PM.pdf Date of access: 11 April 2011.

SPENCER, L.M. & SPENCER, S.M. 1993. Competence at work. New York: John Wiley and Sons, 388 p.

STEFANOVIC, J. & SHENHAR, A. 2006. Toward a new project management maturity model. (*In* Proceedings of PICMET 2006: Papers read at PICMET 2006 held in Istanbul, Turkey from 9 to13 July 2006. p 2156-2180.)

STEVENSON, D.H. & STARKWEATHER, J.A. 2009. PM critical competency index: IT execs prefer soft skills. *International Journal of Project Management*, 28(2010):663-671, Nov.

STEYN, H.S. (JR). 2000. Practical significance of the difference in means. *Journal of Industrial Psychology*, 26(3):1-3.

STEYN, H.S. (JR). 2002. Practically significant relationships between two variables. *South African Journal of Industrial Psychology*, 28(3):10-15.

STRATEGIC DIRECTION. 2007. Spotlight on Richard Scase. *Strategic Direction*, 23(8):28-31. Available from www.richardscase.com Date of access: 25 April 2011.

SUHR, D.D. 2006. Exploratory or confirmatory factor analysis? SAS Institute. Paper 200-31. 17 p. Available from ww2.sas.com/proceedings/sugi31/200-31.pdf Date of access 30 September 2011.

TAVAKOL, M. & DENNICK, R. 2011. Making sense of Cronbach's alpha. *International Journal of Medical Education*, 2(2011):53-55, Jun.

THAMHAIN, H.J. 2004. Linkages of project environment to performance: lessons for team leadership. *International Journal of Project Management*, 22(7):533-544, Jul. Available ScienceDirect.

THAMHAIN, H.J. 2007. Leadership lessons from managing technology-intensive teams. (*In* Proceedings of PICMET 2007: Papers read at PICMET 2007 held in Oregon, USA from 5 to 9 August 2007. p 2057-2063.)

THAMHAIN, H.J. 2009. The future of team leadership in complex project environments. (*In* Cleland, D. & Bidanda, B., eds. 2009. Project management circa 2025. Pennsylvania: Project Management Institute. p 365-381.)

THOMAS, J. & MENGEL, T. 2008. Preparing project managers to deal with complexity – advanced project management education. *International Journal of Project Management*, 26(2008):304-315, Jan. Available ScienceDirect.

THOMAS, J.L., KRAHN, J. & GEORGE, S. 2009. Shaping the future of project management research. (*In* Cleland, D. & Bidanda, B., eds. 2009. Project management circa 2025. Pennsylvania: Project Management Institute. p 129-152.)

THOMAS, S.R., JASELSKIS, E.J. & McDERMOTT, C. 2009. The likely future of project management in the construction industry circa 2025. (*In* Cleland, D. & Bidanda, B., eds. 2009. Project management circa 2025. Pennsylvania: Project Management Institute. p 289-305.)

TOOR, S.R. & OFORI, G. 2008. Leadership for future construction industry: agenda for authentic leadership. *International Journal of Project Management*, 26(6):620-630, Aug. Available ScienceDirect.

TOWNLEY, B. 2010. Managing multiple generations. 10 p. Available from www.motivationalmanagementgroup.com/documents/ManagingMultGen.pdf Date of access: 25 April 2011.

TULGAN, B. 2007. Executive summary: managing the generation mix 2007. 31 p. Available from www.rainmakerthinking.com/pdf%20files/mix2007.pdf Date of access: 25 April 2011.

ULLMAN, J.B. 2006. Structural equation modelling: reviewing the basics and moving forward. *Journal of Personality Assessment*, 87(1), 35-50, Apr.

UN (UNITED NATIONS). 2011. Press release 3 May 2011. Available from http://esa.un.org/unpd/wpp/Other-Information/Press_Release_WPP2010.pdf Date of access: 8 May 2011.

VEIL. C. & TURNER, J.R. 2002. Group efficiency improvement: how to liberate energy in project groups. *International Journal of Project Management*, 20(2):137-142, Feb. Available ScienceDirect.

VOELLER, J.G. 2009. Diminishing natural resources: recognizing limitations, responding to challenges. National Academy of Science's Government-University-Industry Research Roundtable, October 2009. 51 p. Available from http://sites.nationalacademies.org/PGA/guirr/PGA_054088 Date of access: 25 April 2011.

WEAVER, P. 2007. Trends in modern project management, past, present and future. Paper read at PMOZ held in Queensland, Australia from 28 to 31 August 2007. 10 p. Available from www.mosaicprojects.com.au/Resources_Papers_061.html Date of access: 25 April 2011.

WEINSTEIN, J. & JAQUES, T. 2009. State government – project management 2025. (*In* Cleland, D. & Bidanda, B., eds. 2009. Project management circa 2025. Pennsylvania: Project Management Institute. p 345-362.)

WELMAN, C., KRUGER, F. & MITCHELL, B. 2005. Research Methodology. 3rd ed. Cape Town: Oxford University Press Southern Africa. 342 p.

WIDEMAN, R.M. 1995. Criteria for a project management body of knowledge. *International Journal of Project Management*, 13(2):71-75, Feb.

WIDEMAN, R.M. 2001. The future of project management. AEW Services. Vancouver, Canada. Available from www.maxwideman.com/papers/future/future.pdf Date of access: 25 April 2011.

YANG, L., HUANG, C. & WU, K. 2011. The association among project manager's leadership style, teamwork and project success. *International Journal of Project Management*, 29(3):258-267, Mar. Available ScienceDirect.

ZIELINSKI, D. 2005. Soft skills, hard truths. *Training*, 42(7), p18-23,

ZOHAR, D. & MARSHALL, I. 2001. SQ – spiritual intelligence the ultimate intelligence. London, United Kingdom: Bloomsbury. 250 p.

APPENDIX A - QUESTIONNAIRE

SECTION ONE	
Demographic No.	**Demographics**
D1	Your functional area
D2	Gender
D3	Age
D4	Highest qualification
D5	Years in project environment
D6	Monetary value of projects
D7	Role
SECTION TWO	
Question No.	**Project Management Behaviours**
Q1	Communicates effectively with stakeholders.
Q2	Is opportunity driven, without overlooking the risks.
Q3	Acts to promote longer-term business relations.
Q4	Always lives up to agreements.
Q5	Actively manages motivation levels of the team.
Q6	Recognises non-optimal use of resources and takes corrective action.
Q7	Gives others responsibility with delegated authority.
Q8	Listens attentively
Q9	Keeps an eye on the detail, but not at the expense of the bigger picture.
Q10	Promotes active participation of all team members
Q11	Balances work life and private life.
Q12	Acts in an appropriate manner.
Q13	Aims for win/win situations.
Q14	Is flexible, adapts easily to change.
Q15	Creates enthusiasm.
Q16	Is capable of taking the heat out of a situation at the right moment.
Q17	Asks for positive inputs.
Q18	Is a realistic optimist.
Q19	Controls his team members' behaviour appropriately.
Q20	Finds solutions by applying new concepts, tools and common sense in new areas.
Q21	Continually challenges the status quo for improvements.

Question No.	Project Management Behaviours
Q22	Shares information fully.
Q23	Is open to age, gender, sexual orientation, religion, cultural and disability differences.
Q24	Stimulates team involvement.
Q25	Adopts a leadership style appropriate to the specific team and work situation.
Q26	Pays attention to stressful situations relieving tension where possible.
Q27	Stimulates people to find improvements all the time.
Q28	Always considers the proposals of others'.
Q29	Is creative with an open mind to new ideas.
Q30	Supports the creation of a consultative culture in the team.
Q31	Has an open and positive attitude.
Q32	Allows sufficient freedom for team members to carry out work in their own ways.
Q33	Brings energy to the group.
Q34	Communicates openly.
Q35	Negotiates hard but maintains a positive personal relationship.
Q36	Is able to discuss and debate issues with the team.
Q37	Respects ethical values even in times of conflict or crisis.
Q38	Delivers on what was agreed to the required quality, on time and within budget.
Q39	Is open in dealing with contradicting interests.
Q40	Defines sub-responsibilities clearly.
Q41	Adequately balances his own interests and those of others.
Q42	Has discipline.
Q43	Takes others' values, feelings, desires and needs seriously whilst maintaining focus on the project scope.
Q44	Is inspiring, makes people proud to work with him.
Q45	Has the ability to negotiate through to a successful conclusion.
Q46	Is aware of emerging conflicts.
Q47	Welcomes initiatives and stimulates engagement from others.
Q48	Reaches consensus with others.
Q49	Is open to criticism.
Q50	Seeks mutual understanding.
Q51	Does not abuse his position (i.e. power and influence).
Q52	Harnesses the energy of all team members.
Q53	Has a vision and brings it to life.
Q54	Controls his emotions.
Q55	Demonstrates influence and authority.
Q56	Accepts total accountability, even when tasks are delegated.
Q57	Accepts uncertainty as a challenge.

APPENDIX B – CODING OF QUESTIONNAIRE

		Coding	Description
D1	**Function**	1	Commercial and Legal
		2	Engineering Management
		3	Project Management and Control
		4	Process Design
		5	Environmental and Risk
		6	Control Engineering
		7	Electrical Engineering
		8	Mechanical Engineering
		9	Civil Engineering
		10	Sustainability
		11	Other
D2	**Gender**	1	Male
		2	Female
D3	**Age**	1	20 to 29
		2	30 to 39
		3	40 to 49
		4	50 to 59
		5	60 and above
D4	**Highest Qualification**	1	Matric certificate
		2	Diploma
		3	Bachelor's degree
		4	Master's degree
		5	Doctorate
		6	Other
D5	**Years in project environment**	1	Less than 5 years
		2	5 to 10 years
		3	11 to 15 years
		4	16 to 20 years
		5	More than 20 years
D6	**Monetary value of projects**	1	Less than R1 million
		2	R1 million to R9.99 million
		3	R10 million to R99 million
		4	R100 million to R1 billion
		5	Over R1 billion

		Coding	Description
D7	**Role**	1	Programme Manager / Portfolio Manager
		2	Functional Manager
		3	Project Manager
		4	Engineering Manager
		5	Project team member
		6	Member of project management organisation (e.g. support, governance, training, guidance, etc.)
Q1-52	**Questions - Behaviours NOW and in FUTURE**	1	Not important
		2	Slightly important
		3	Quite important
		4	Very important

APPENDIX C – CONSTRUCTS

Construct	Question No.	Project Management Behaviours
C1 Leadership	Q25	Adopts a leadership style appropriate to the specific team and work situation.
	Q44	Is inspiring, makes people proud to work with him.
	Q53	Has a vision and brings it to life.
	Q56	Accepts total accountability, even when tasks are delegated.
C2 Engagement & Motivation	Q5	Actively manages motivation levels of the team.
	Q7	Gives others responsibility with delegated authority.
	Q24	Stimulates team involvement.
	Q47	Welcomes initiatives and stimulates engagement from others.
C3 Self-control	Q11	Balances work life and private life.
	Q54	Controls his emotions.
C4 Assertiveness	Q12	Acts in an appropriate manner.
	Q15	Creates enthusiasm.
	Q31	Has an open and positive attitude.
	Q55	Demonstrates influence and authority.
C5 Relaxation	Q16	Is capable of taking the heat out of a situation at the right moment.
	Q26	Pays attention to stressful situations relieving tension where possible.

Construct	Question No.	Project Management Behaviours
C6 Openness	Q10	Promotes active participation of all team members
	Q14	Is flexible, adapts easily to change.
	Q18	Is a realistic optimist.
	Q23	Is open to age, gender, sexual orientation, religion, cultural and disability differences.
C7 Creativity	Q20	Finds solutions by applying new concepts, tools and common sense in new areas.
	Q29	Is creative with an open mind to new ideas.
C8 Results-orientation	Q2	Is opportunity driven, without overlooking the risks.
	Q9	Keeps an eye on the detail, but not at the expense of the bigger picture.
	Q21	Continually challenges the status quo for improvements.
C9 Efficiency	Q6	Recognises non-optimal use of resources and takes corrective action.
	Q17	Asks for positive inputs.
	Q27	Stimulates people to find improvements all the time.
	Q49	Is open to criticism.
C10 Consultation	Q28	Always considers the proposals of others'.
	Q30	Supports the creation of a consultative culture in the team.
	Q33	Brings energy to the group.
	Q48	Reaches consensus with others.
	Q52	Harnesses the energy of all team members.

Construct	Question No.	Project Management Behaviours
C11 Negotiation	Q3	Acts to promote longer-term business relations.
	Q13	Aims for win/win situations.
	Q35	Negotiates hard but maintains a positive personal relationship.
	Q45	Has the ability to negotiate through to a successful conclusion.
C12 Conflict & Crisis	Q36	Is able to discuss and debate issues with the team.
	Q39	Is open in dealing with contradicting interests.
	Q46	Is aware of emerging conflicts.
	Q57	Accepts uncertainty as a challenge.
C13 Reliability	Q19	Controls his team members' behaviour appropriately.
	Q38	Delivers on what was agreed to the required quality, on time and within budget.
	Q40	Defines sub-responsibilities clearly.
	Q42	Has discipline.
C14 Values Appreciation	Q32	Allows sufficient freedom for team members to carry out work in their own ways.
	Q41	Adequately balances his own interests and those of others.
	Q43	Takes others' values, feelings, desires and needs seriously whilst maintaining focus on the project scope.
C15 Ethics	Q4	Always lives up to agreements.
	Q37	Respects ethical values even in times of conflict or crisis.
	Q51	Does not abuse his position (i.e. power and influence).

Construct	Question No.	Project Management Behaviours
C16 Communication	Q1	Communicates effectively with stakeholders.
	Q8	Listens attentively
	Q22	Shares information fully.
	Q34	Communicates openly.
	Q50	Seeks mutual understanding.

APPENDIX D – FREQUENCY ANALYSIS, DESCRIPTIVE STATISTICS

OBSERVED			1	2	3	4	Total	Mean Score	Std. Dev.
	Project Management Behaviours	Construct	Not Important	Slightly Important	Quite Important	Very Important			
Q1	Communicates effectively with stakeholders.	C16	1.71%	16.00%	37.71%	44.57%	175	3.25	0.78
Q2	Is opportunity driven, without overlooking the risks.	C8	2.86%	32.00%	48.57%	16.57%	175	2.79	0.75
Q3	Acts to promote longer-term business relations.	C11	6.86%	28.00%	45.71%	19.43%	175	2.78	0.84
Q4	Always lives up to agreements.	C15	6.29%	20.00%	49.71%	24.00%	175	2.91	0.83
Q5	Actively manages motivation levels of the team.	C2	17.75%	32.54%	36.69%	13.02%	169	2.45	0.93
Q6	Recognises non-optimal use of resources and takes corrective action.	C9	11.24%	34.91%	39.64%	14.20%	169	2.57	0.87
Q7	Gives others responsibility with delegated authority.	C2	4.73%	29.59%	47.93%	17.75%	169	2.79	0.79
Q8	Listens attentively	C16	8.88%	31.95%	33.14%	26.04%	169	2.76	0.94
Q9	Keeps an eye on the detail, but not at the expense of the bigger picture.	C8	4.17%	30.36%	53.57%	11.90%	168	2.73	0.72
Q10	Promotes active participation of all team members	C6	4.76%	32.74%	43.45%	19.05%	168	2.77	0.81
Q11	Balances work life and private life.	C3	10.71%	36.90%	33.93%	18.45%	168	2.60	0.91
Q12	Acts in an appropriate manner.	C4	2.98%	25.60%	47.02%	24.40%	168	2.93	0.79
Q13	Aims for win/win situations.	C11	7.19%	29.34%	38.92%	24.55%	167	2.81	0.89
Q14	Is flexible, adapts easily to change.	C6	5.99%	37.72%	41.92%	14.37%	167	2.65	0.80
Q15	Creates enthusiasm.	C4	14.37%	41.92%	29.34%	14.37%	167	2.44	0.91
Q16	Is capable of taking the heat out of a situation at the right moment.	C5	5.39%	34.73%	43.71%	16.17%	167	2.71	0.80
Q17	Asks for positive inputs.	C9	6.71%	23.17%	51.22%	18.90%	164	2.82	0.81
Q18	Is a realistic optimist.	C6	9.76%	30.49%	48.17%	11.59%	164	2.62	0.82
Q19	Controls his team members' behaviour appropriately.	C13	9.15%	35.37%	38.41%	17.07%	164	2.63	0.87
Q20	Finds solutions by applying new concepts, tools and common sense in new areas.	C7	14.02%	32.32%	43.29%	10.37%	164	2.50	0.86
Q21	Continually challenges the status quo for improvements.	C8	16.15%	31.68%	38.51%	13.66%	161	2.50	0.92
Q22	Shares information fully.	C16	15.63%	34.78%	27.33%	22.36%	161	2.57	1.00
Q23	Is open to age, gender, sexual orientation, religion, cultural and disability differences.	C6	8.70%	22.98%	40.99%	27.33%	161	2.87	0.92
Q24	Stimulates team involvement.	C2	4.35%	34.78%	37.89%	22.98%	161	2.80	0.84
Q25	Adopts a leadership style appropriate to the specific team and work situation.	C1	9.43%	34.59%	34.59%	21.38%	159	2.68	0.92

OBSERVED			1	2	3	4	Total	Mean Score	Std. Dev.
	Project Management Behaviours	Construct	Not Important	Slightly Important	Quite Important	Very Important			
Q26	Pays attention to stressful situations relieving tension where possible.	C5	9.43%	38.99%	35.85%	15.72%	159	2.58	0.87
Q27	Stimulates people to find improvements all the time.	C9	9.43%	43.40%	34.59%	12.58%	159	2.50	0.83
Q28	Always considers the proposals of others'.	C10	5.66%	40.25%	35.85%	18.24%	159	2.67	0.84
Q29	Is creative with an open mind to new ideas.	C7	8.28%	37.58%	38.85%	15.29%	157	2.61	0.84
Q30	Supports the creation of a consultative culture in the team.	C10	7.64%	31.21%	42.68%	18.47%	157	2.72	0.85
Q31	Has an open and positive attitude.	C4	1.27%	31.21%	44.59%	22.93%	157	2.89	0.77
Q32	Allows sufficient freedom for team members to carry out work in their own ways.	C14	5.73%	30.57%	47.13%	16.56%	157	2.75	0.80
Q33	Brings energy to the group.	C10	9.62%	33.97%	39.74%	16.67%	156	2.63	0.87
Q34	Communicates openly.	C16	5.77%	30.13%	41.67%	22.44%	156	2.81	0.85
Q35	Negotiates hard but maintains a positive personal relationship.	C11	5.77%	30.13%	40.38%	23.72%	156	2.82	0.86
Q36	Is able to discuss and debate issues with the team.	C12	5.77%	25.64%	46.15%	22.44%	156	2.85	0.83
Q37	Respects ethical values even in times of conflict or crisis.	C15	3.85%	19.87%	40.38%	35.90%	156	3.08	0.84
Q38	Delivers on what was agreed to the required quality, on time and within budget.	C13	3.21%	25.00%	41.03%	30.77%	156	2.99	0.83
Q39	Is open in dealing with contradicting interests.	C12	4.49%	26.92%	48.72%	19.87%	156	2.84	0.79
Q40	Defines sub-responsibilities clearly.	C13	9.62%	27.56%	41.67%	21.15%	156	2.74	0.90
Q41	Adequately balances his own interests and those of others.	C14	4.49%	33.97%	50.64%	10.90%	156	2.68	0.73
Q42	Has discipline.	C13	3.21%	27.56%	42.95%	26.28%	156	2.92	0.81
Q43	Takes others' values, feelings, desires and needs seriously whilst maintaining focus on the project scope.	C14	5.77%	34.62%	46.15%	13.46%	156	2.67	0.78
Q44	Is inspiring, makes people proud to work with him.	C1	10.26%	37.82%	35.90%	16.03%	156	2.58	0.88
Q45	Has the ability to negotiate through to a successful conclusion.	C11	3.85%	18.59%	54.49%	23.08%	156	2.97	0.76
Q46	Is aware of emerging conflicts.	C12	4.49%	34.62%	41.67%	19.23%	156	2.76	0.81
Q47	Welcomes initiatives and stimulates engagement from others.	C2	7.05%	33.33%	42.31%	17.31%	156	2.70	0.84
Q48	Reaches consensus with others.	C10	3.85%	28.85%	53.21%	14.10%	156	2.78	0.73
Q49	Is open to criticism.	C9	14.10%	30.77%	39.74%	15.38%	156	2.56	0.92
Q50	Seeks mutual understanding.	C16	4.49%	27.56%	49.36%	18.59%	156	2.82	0.78
Q51	Does not abuse his position (i.e. power and influence).	C15	10.26%	17.31%	41.03%	31.41%	156	2.93	0.95
Q52	Harnesses the energy of all team members.	C10	6.41%	32.05%	39.10%	22.44%	156	2.78	0.87

OBSERVED			1	2	3	4	Total	Mean Score	Std. Dev.
	Project Management Behaviours	Construct	Not Important	Slightly Important	Quite Important	Very Important			
Q53	Has a vision and brings it to life.	C1	9.68%	33.55%	41.94%	14.84%	155	2.62	0.85
Q54	Controls his emotions.	C3	7.10%	21.29%	54.84%	16.77%	155	2.81	0.80
Q55	Demonstrates influence and authority.	C4	4.52%	27.10%	49.68%	18.71%	155	2.83	0.78
Q56	Accepts total accountability, even when tasks are delegated.	C1	7.10%	27.74%	40.00%	25.16%	155	2.83	0.89
Q57	Accepts uncertainty as a challenge.	C12	4.52%	26.45%	49.03%	20.00%	155	2.85	0.79

Legend:

Highest Mean Scores

Lowest Mean Scores

EXPECTED			1	2	3	4	Total	Mean Score	Std. Dev.
	Project Management Behaviours	Construct	Not Important	Slightly Important	Quite Important	Very Important			
Q1	Communicates effectively with stakeholders.	C16	0.00%	0.57%	16.57%	82.86%	175	3.82	0.40
Q2	Is opportunity driven, without overlooking the risks.	C8	0.57%	3.43%	41.14%	54.86%	175	3.50	0.60
Q3	Acts to promote longer-term business relations.	C11	0.00%	1.14%	40.00%	58.86%	175	3.58	0.52
Q4	Always lives up to agreements.	C15	0.00%	0.57%	29.14%	70.29%	175	3.70	0.47
Q5	Actively manages motivation levels of the team.	C2	0.00%	3.55%	36.69%	59.76%	169	3.56	0.56
Q6	Recognises non-optimal use of resources and takes corrective action.	C9	0.00%	1.78%	36.09%	62.13%	169	3.60	0.53
Q7	Gives others responsibility with delegated authority.	C2	0.00%	2.37%	46.15%	51.48%	169	3.49	0.55
Q8	Listens attentively	C16	0.00%	1.78%	34.32%	63.91%	169	3.62	0.52
Q9	Keeps an eye on the detail, but not at the expense of the bigger picture.	C8	1.19%	4.76%	47.02%	47.02%	168	3.40	0.64
Q10	Promotes active participation of all team members	C6	0.00%	1.19%	33.93%	64.88%	168	3.64	0.51
Q11	Balances work life and private life.	C3	1.19%	4.76%	38.69%	55.36%	168	3.48	0.65
Q12	Acts in an appropriate manner.	C4	0.00%	1.79%	39.88%	58.33%	168	3.57	0.53
Q13	Aims for win/win situations.	C11	0.00%	3.59%	39.52%	56.89%	167	3.53	0.57
Q14	Is flexible, adapts easily to change.	C6	0.00%	2.99%	40.12%	56.89%	167	3.54	0.56
Q15	Creates enthusiasm.	C4	0.60%	5.39%	46.71%	47.31%	167	3.41	0.62
Q16	Is capable of taking the heat out of a situation at the right moment.	C5	0.00%	1.80%	41.32%	56.89%	167	3.55	0.53
Q17	Asks for positive inputs.	C9	0.00%	2.44%	50.61%	46.95%	164	3.45	0.55
Q18	Is a realistic optimist.	C6	1.22%	6.10%	52.44%	40.24%	164	3.32	0.64
Q19	Controls his team members' behaviour appropriately.	C13	1.83%	6.10%	51.22%	40.85%	164	3.32	0.67
Q20	Finds solutions by applying new concepts, tools and common sense in new areas.	C7	0.61%	4.88%	37.80%	56.71%	164	3.51	0.62
Q21	Continually challenges the status quo for improvements.	C8	0.62%	3.73%	53.42%	42.24%	161	3.37	0.59
Q22	Shares information fully.	C16	0.00%	2.48%	39.13%	58.39%	161	3.56	0.55
Q23	Is open to age, gender, sexual orientation, religion, cultural and disability differences.	C6	1.24%	6.21%	41.61%	50.93%	161	3.42	0.67
Q24	Stimulates team involvement.	C2	0.00%	1.86%	32.92%	65.22%	161	3.63	0.52
Q25	Adopts a leadership style appropriate to the specific team and work situation.	C1	0.00%	1.26%	35.22%	63.52%	159	3.62	0.51
Q26	Pays attention to stressful situations relieving tension where possible.	C5	1.26%	1.89%	47.17%	49.69%	159	3.45	0.60
Q27	Stimulates people to find improvements all the time.	C9	0.00%	5.03%	47.17%	47.80%	159	3.43	0.59

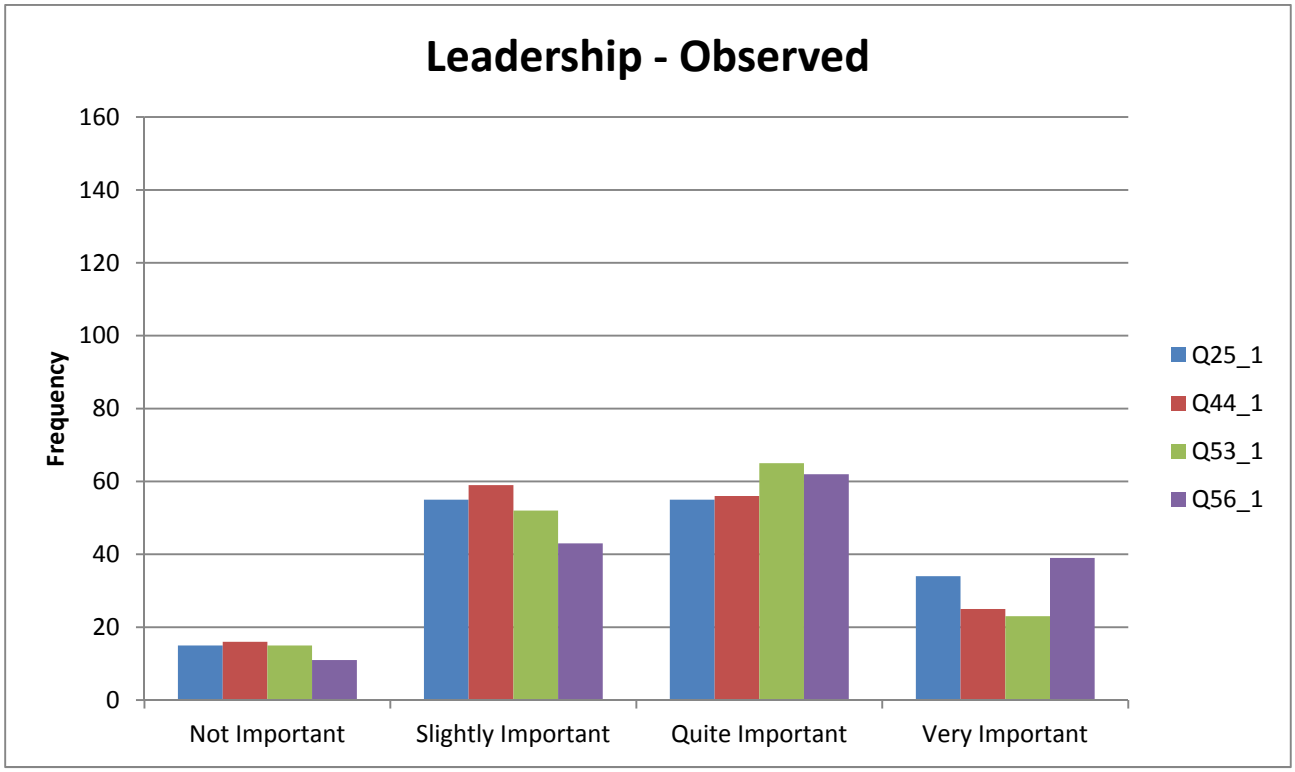
EXPECTED			1	2	3	4	Total	Mean Score	Std. Dev.
	Project Management Behaviours	Construct	Not Important	Slightly Important	Quite Important	Very Important			
Q28	Always considers the proposals of others'.	C10	0.00%	3.77%	45.91%	50.31%	159	3.46	0.57
Q29	Is creative with an open mind to new ideas.	C7	0.64%	2.55%	48.41%	48.41%	157	3.45	0.58
Q30	Supports the creation of a consultative culture in the team.	C10	0.00%	3.82%	51.59%	44.59%	157	3.41	0.57
Q31	Has an open and positive attitude.	C4	0.00%	1.91%	45.86%	52.23%	157	3.50	0.54
Q32	Allows sufficient freedom for team members to carry out work in their own ways.	C14	0.00%	10.19%	46.50%	43.31%	157	3.33	0.65
Q33	Brings energy to the group.	C10	0.00%	5.13%	51.92%	42.95%	156	3.38	0.58
Q34	Communicates openly.	C16	0.00%	1.28%	40.38%	58.33%	156	3.57	0.52
Q35	Negotiates hard but maintains a positive personal relationship.	C11	0.00%	3.21%	41.03%	55.77%	156	3.53	0.56
Q36	Is able to discuss and debate issues with the team.	C12	0.00%	2.56%	46.79%	50.64%	156	3.48	0.55
Q37	Respects ethical values even in times of conflict or crisis.	C15	0.64%	0.64%	39.10%	59.62%	156	3.58	0.55
Q38	Delivers on what was agreed to the required quality, on time and within budget.	C13	0.00%	0.00%	27.56%	72.44%	156	3.72	0.45
Q39	Is open in dealing with contradicting interests.	C12	0.00%	1.28%	48.08%	50.64%	156	3.49	0.53
Q40	Defines sub-responsibilities clearly.	C13	0.00%	1.92%	48.08%	50.00%	156	3.48	0.54
Q41	Adequately balances his own interests and those of others.	C14	0.00%	4.49%	60.26%	35.26%	156	3.31	0.55
Q42	Has discipline.	C13	0.00%	0.64%	33.97%	65.38%	156	3.65	0.49
Q43	Takes others' values, feelings, desires and needs seriously whilst maintaining focus on the project scope.	C14	0.00%	4.49%	52.56%	42.95%	156	3.38	0.57
Q44	Is inspiring, makes people proud to work with him.	C1	0.00%	5.13%	41.03%	53.85%	156	3.49	0.60
Q45	Has the ability to negotiate through to a successful conclusion.	C11	0.00%	0.00%	33.33%	66.67%	156	3.67	0.47
Q46	Is aware of emerging conflicts.	C12	0.00%	1.28%	54.49%	44.23%	156	3.43	0.52
Q47	Welcomes initiatives and stimulates engagement from others.	C2	0.00%	3.85%	52.56%	43.59%	156	3.40	0.56
Q48	Reaches consensus with others.	C10	0.00%	3.21%	51.28%	45.51%	156	3.42	0.56
Q49	Is open to criticism.	C9	0.64%	7.69%	51.92%	39.74%	156	3.31	0.64
Q50	Seeks mutual understanding.	C16	0.00%	4.49%	53.21%	42.31%	156	3.38	0.57
Q51	Does not abuse his position (i.e. power and influence).	C15	1.28%	5.13%	36.54%	57.05%	156	3.49	0.66
Q52	Harnesses the energy of all team members.	C10	0.00%	2.56%	41.67%	55.77%	156	3.53	0.55
Q53	Has a vision and brings it to life.	C1	0.00%	5.81%	46.45%	47.74%	155	3.42	0.60
Q54	Controls his emotions.	C3	0.00%	3.23%	47.10%	49.68%	155	3.46	0.56

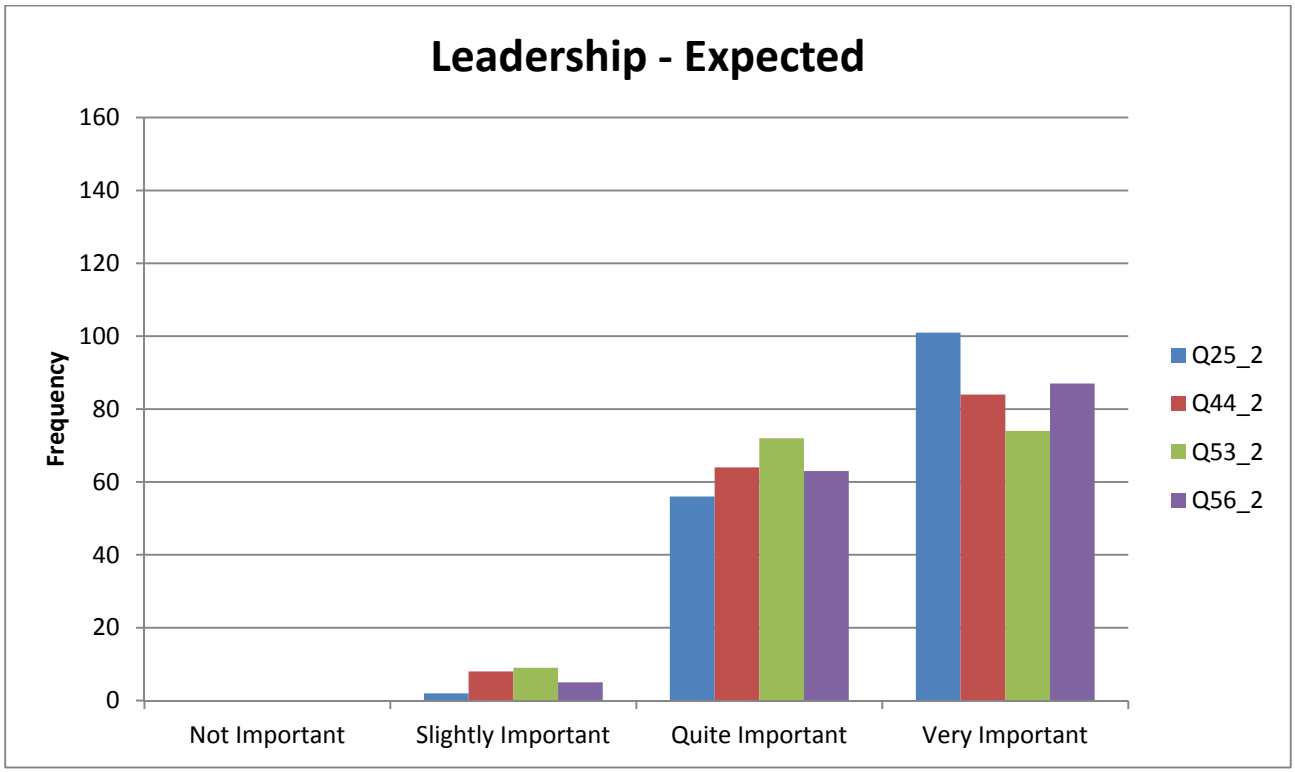
EXPECTED			1	2	3	4	Total	Mean Score	Std. Dev.
	Project Management Behaviours	Construct	Not Important	Slightly Important	Quite Important	Very Important			
Q55	Demonstrates influence and authority.	C4	0.65%	5.81%	48.39%	45.16%	155	3.38	0.63
Q56	Accepts total accountability, even when tasks are delegated.	C1	0.00%	3.23%	40.65%	56.13%	155	3.52	0.56
Q57	Accepts uncertainty as a challenge.	C12	0.00%	0.65%	43.87%	55.48%	155	3.55	0.51

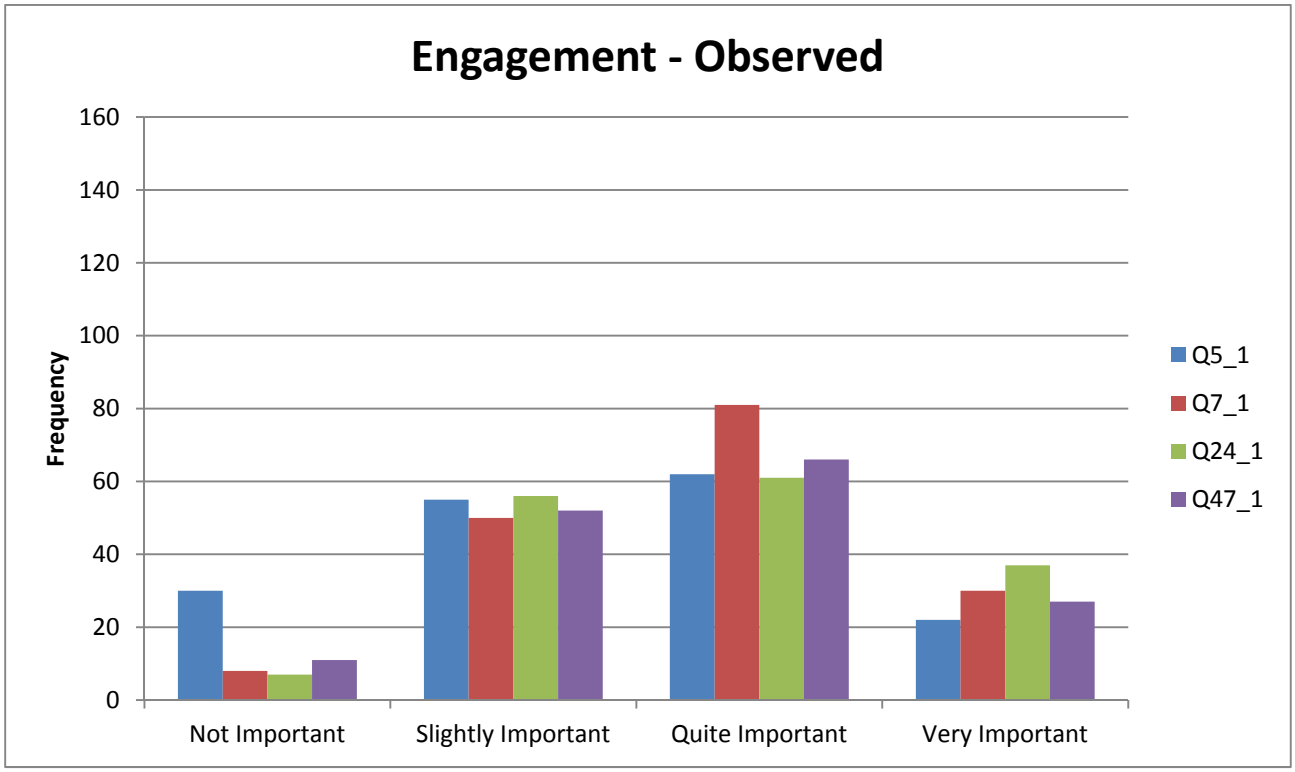
Legend:

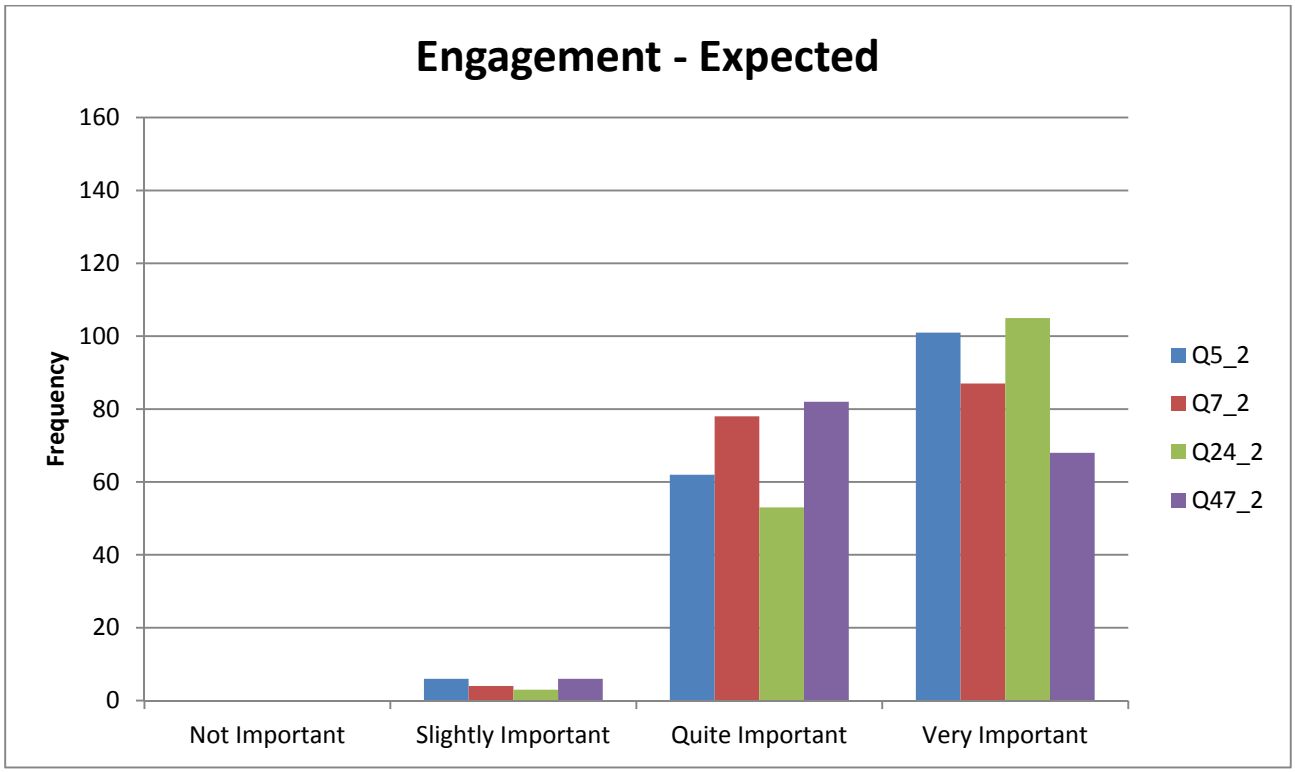
Highest Mean Scores

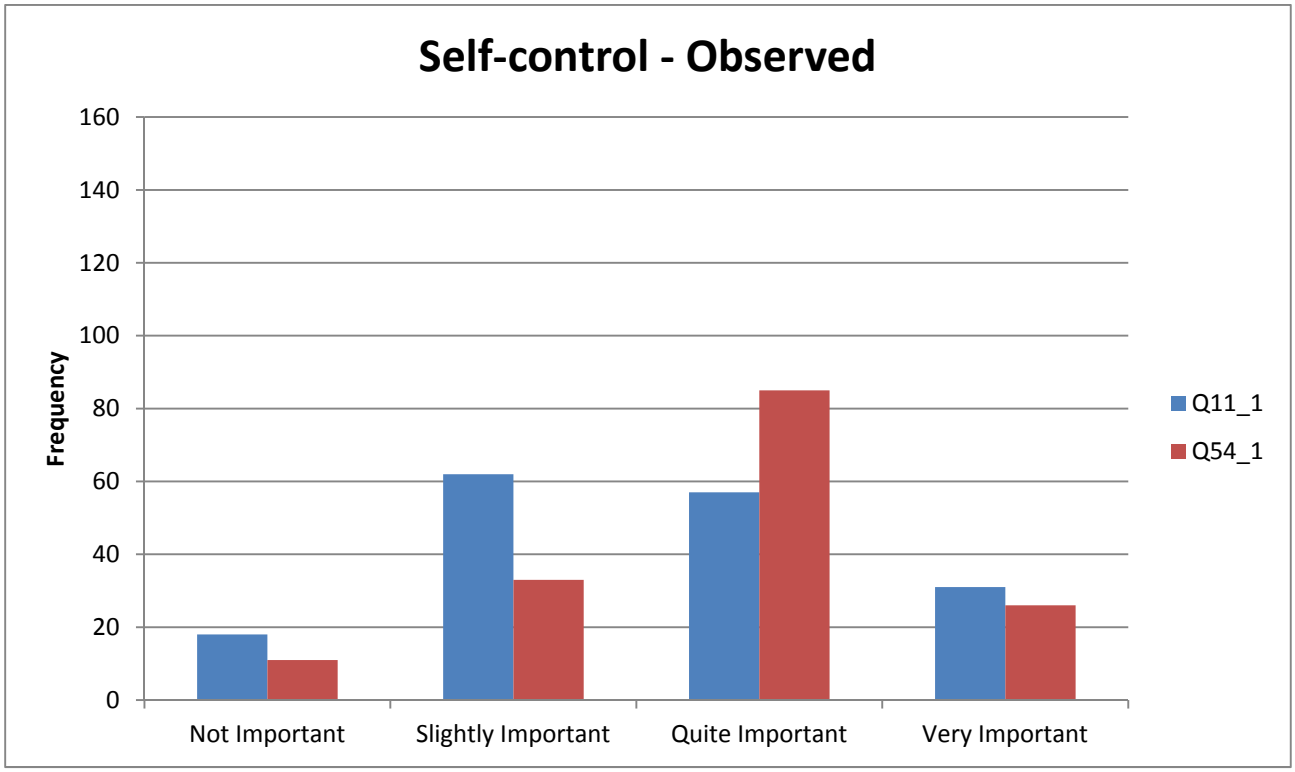
Lowest Mean Scores

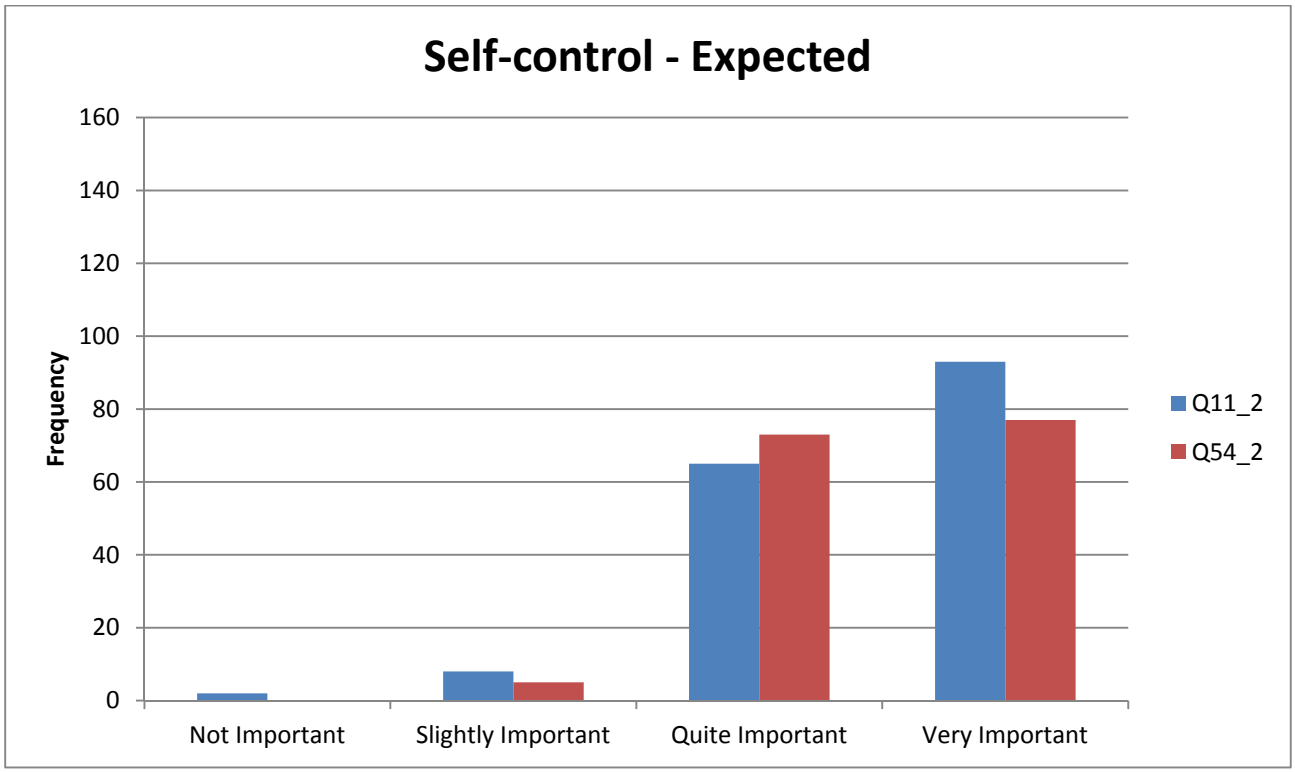

Leadership - Observed
160
140
120
100
80
60
40
20
0
Frequency
Not Important
Slightly Important
Quite Important
Very Important
Q25_1
Q44_1
Q53_1
Q56_1

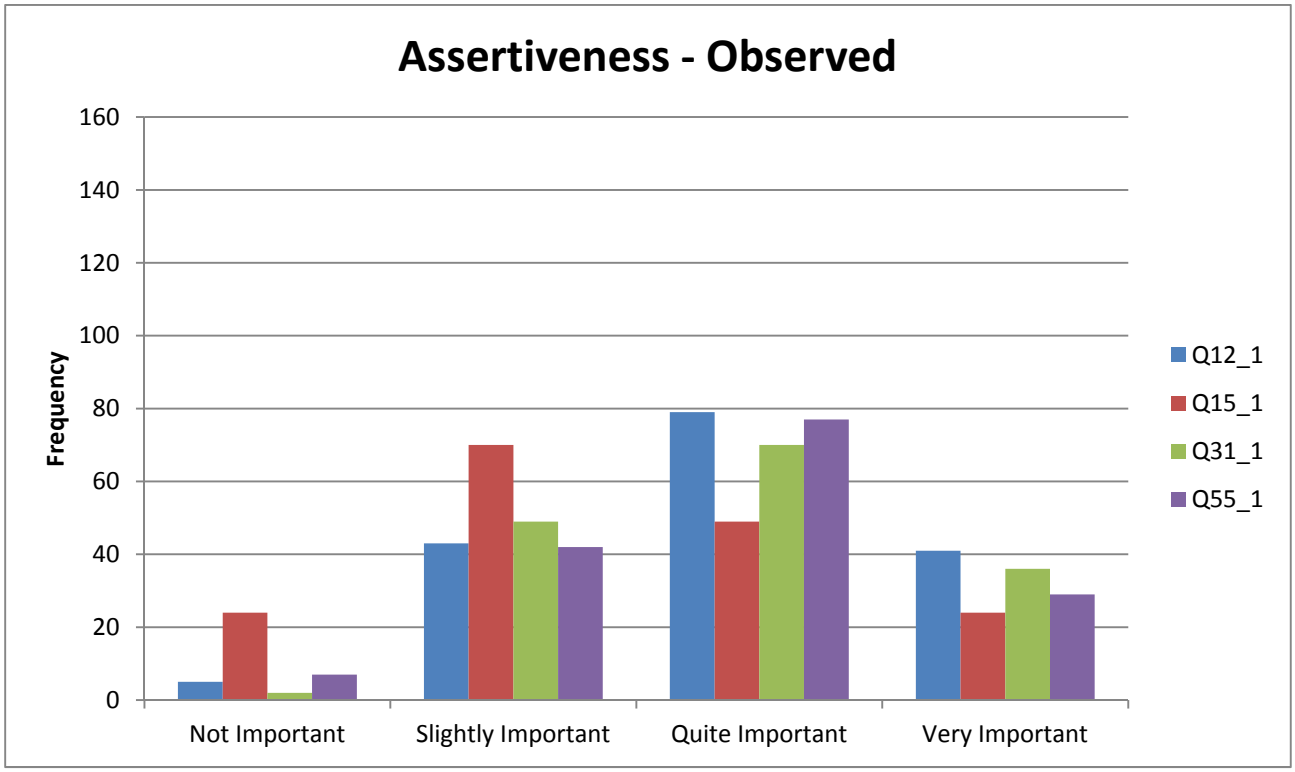

Leadership - Expected
160
140
120
100
80
60
40
20
0
Frequency
Not Important
Slightly Important
Quite Important
Very Important
Q25_2
Q44_2
Q53_2
Q56_2

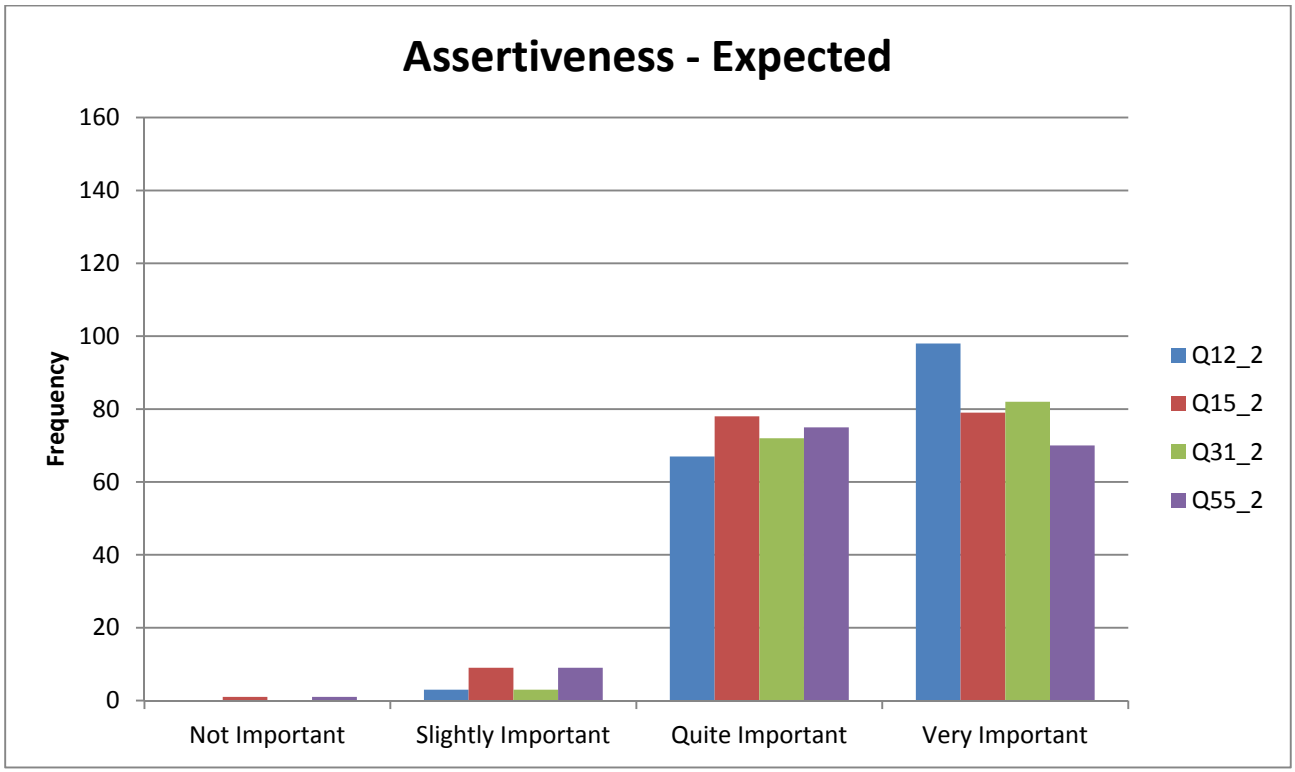

Engagement - Observed
160
140
120
100
80
60
40
20
0
Frequency
Not Important
Slightly Important
Quite Important
Very Important
Q5_1
Q7_1
Q24_1
Q47_1

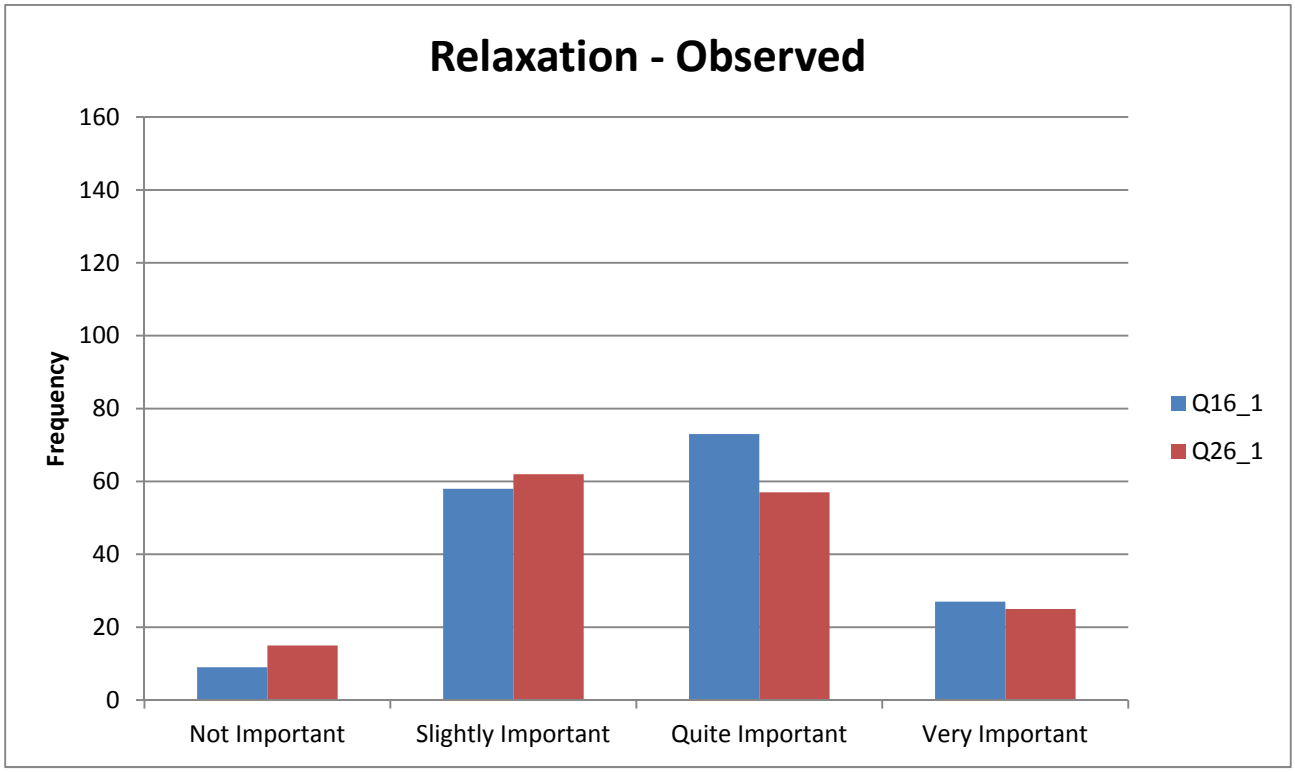

Engagement - Expected
160
140
120
100
80
60
40
20
0
Frequency
Not Important
Slightly Important
Quite Important
Very Important
Q5_2
Q7_2
Q24_2
Q47_2

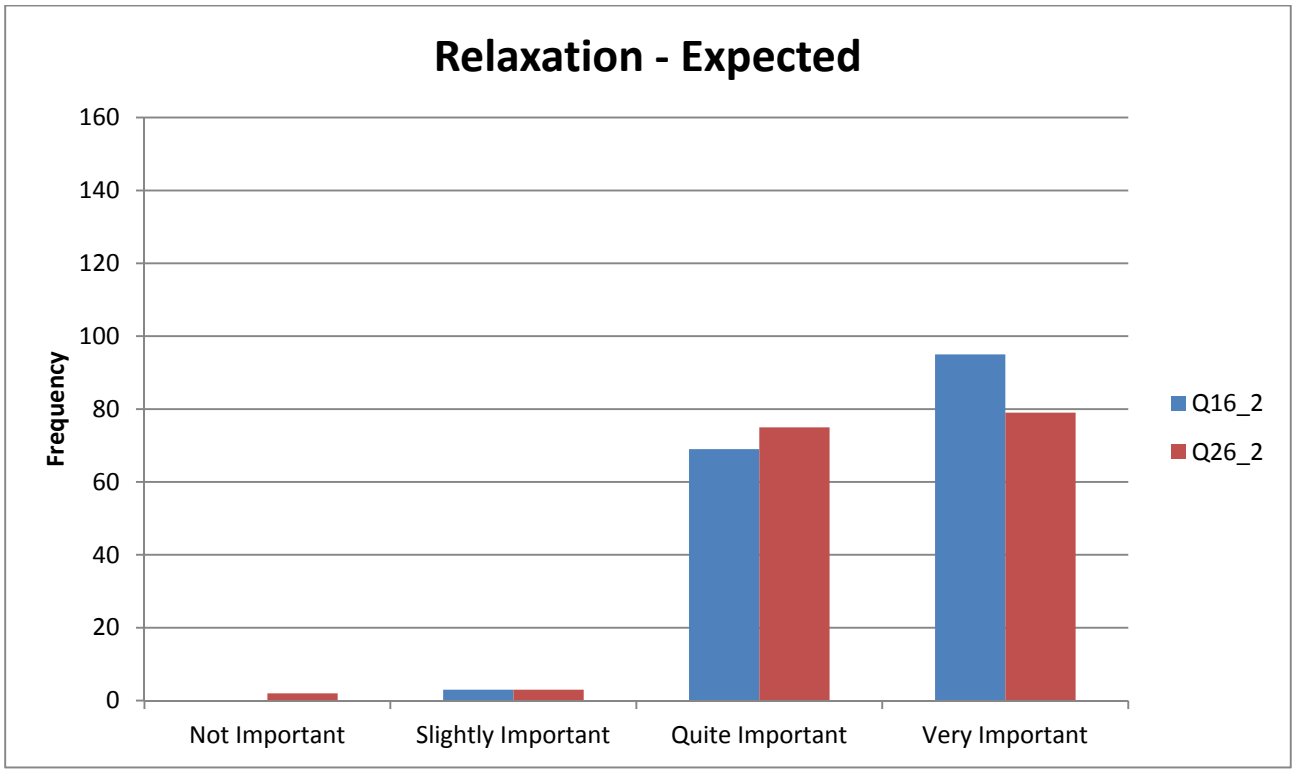

Self-control - Observed
160
140
120
100
80
60
40
20
0
Frequency
Not Important
Slightly Important
Quite Important
Very Important
Q11_1
Q54_1

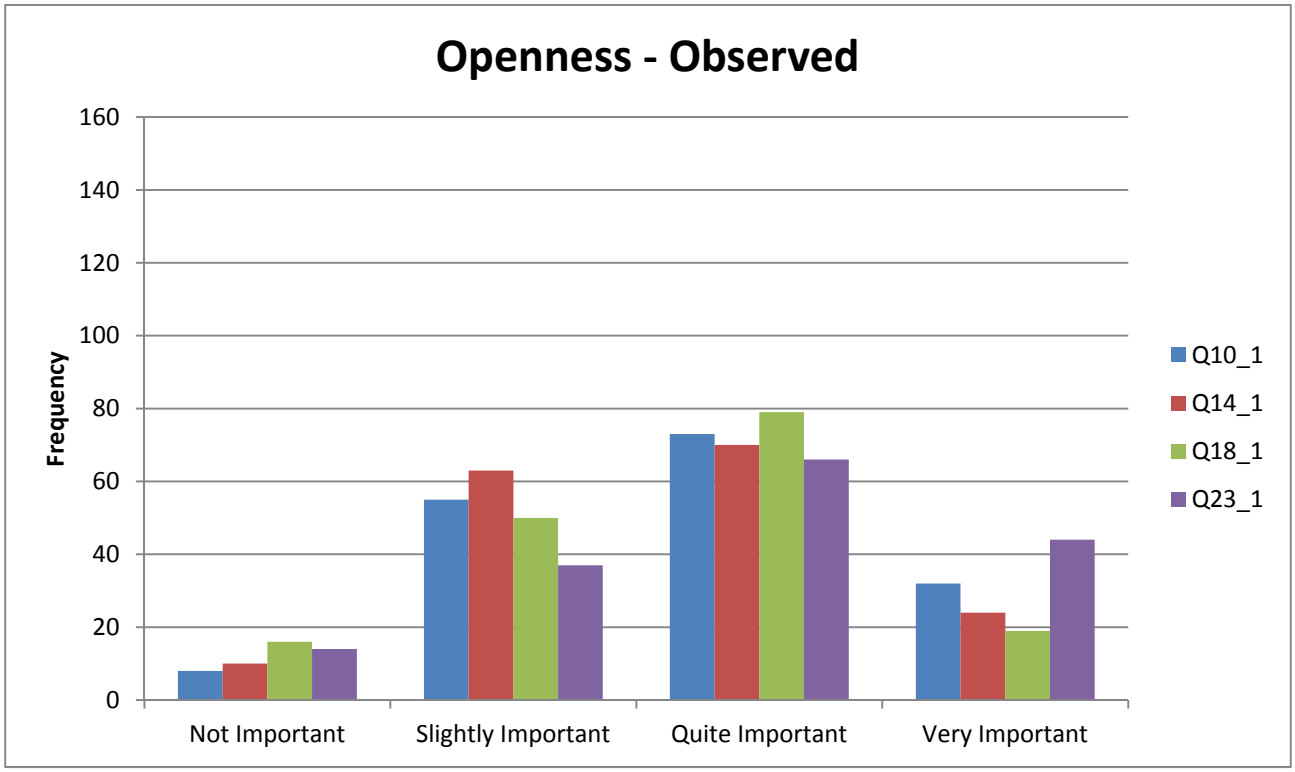

Self-control - Expected
160
140
120
100
80
60
40
20
0
Frequency
Not Important
Slightly Important
Quite Important
Very Important
Q11_2
Q54_2

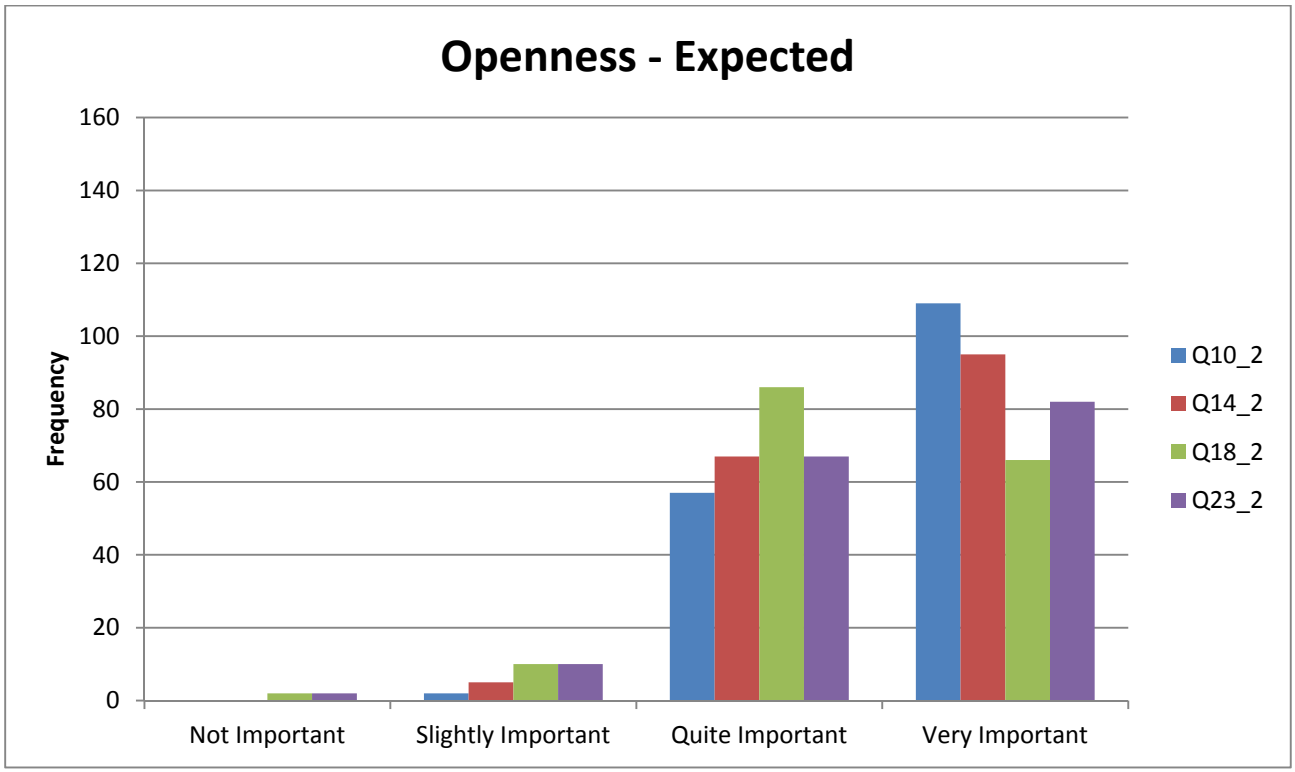

Assertiveness - Observed
160
140
120
100
80
60
40
20
0
Frequency
Not Important
Slightly Important
Quite Important
Very Important
Q12_1
Q15_1
Q31_1
Q55_1

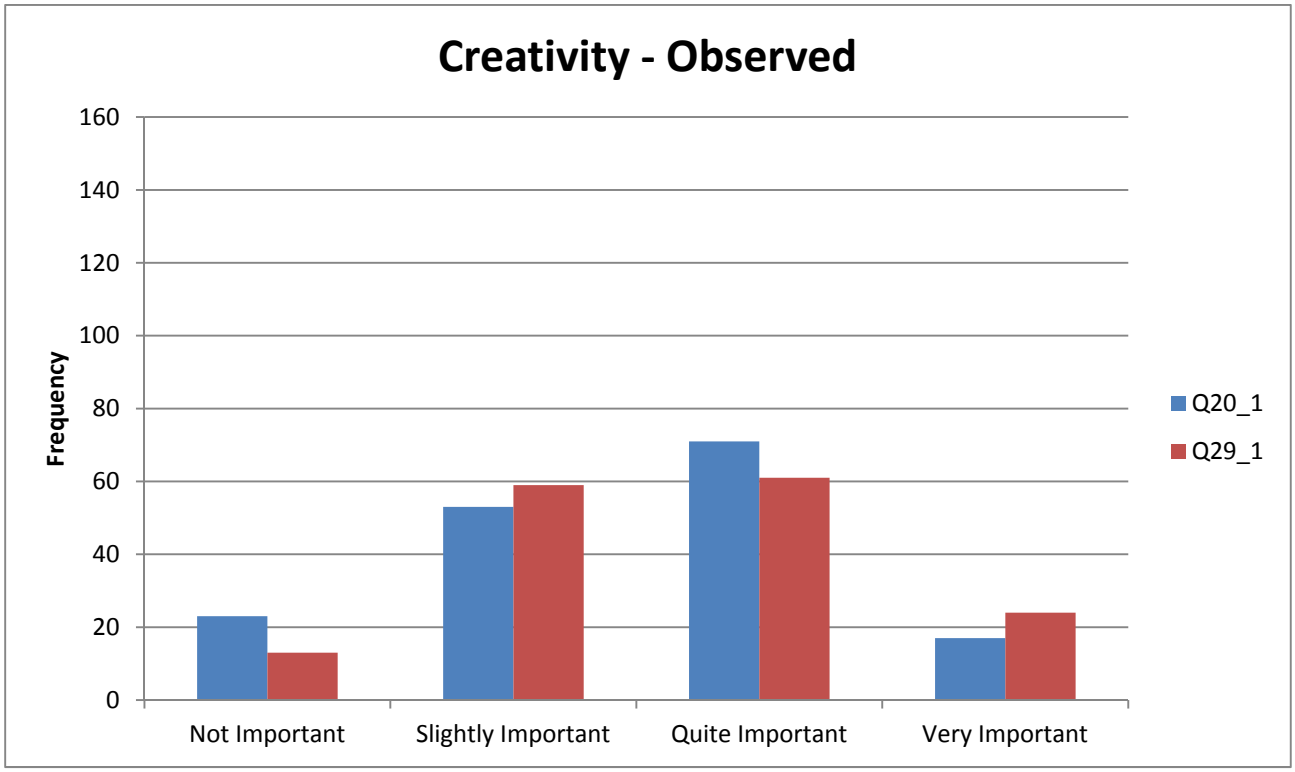

Assertiveness - Expected
160
140
120
100
80
60
40
20
0
Frequency
Not Important
Slightly Important
Quite Important
Very Important
Q12_2
Q15_2
Q31_2
Q55_2

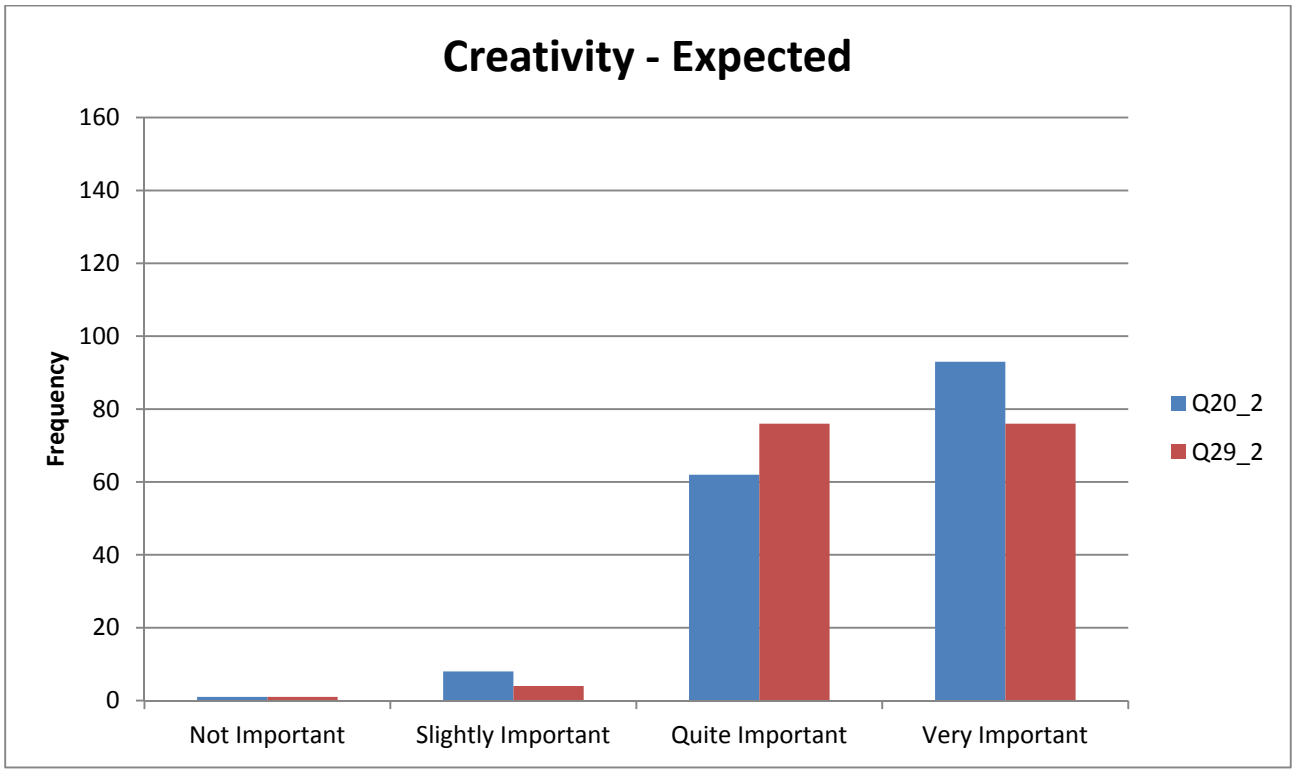

Relaxation - Observed
160
140
120
100
80
60
40
20
0
Frequency
Not Important
Slightly Important
Quite Important
Very Important
Q16_1
Q26_1

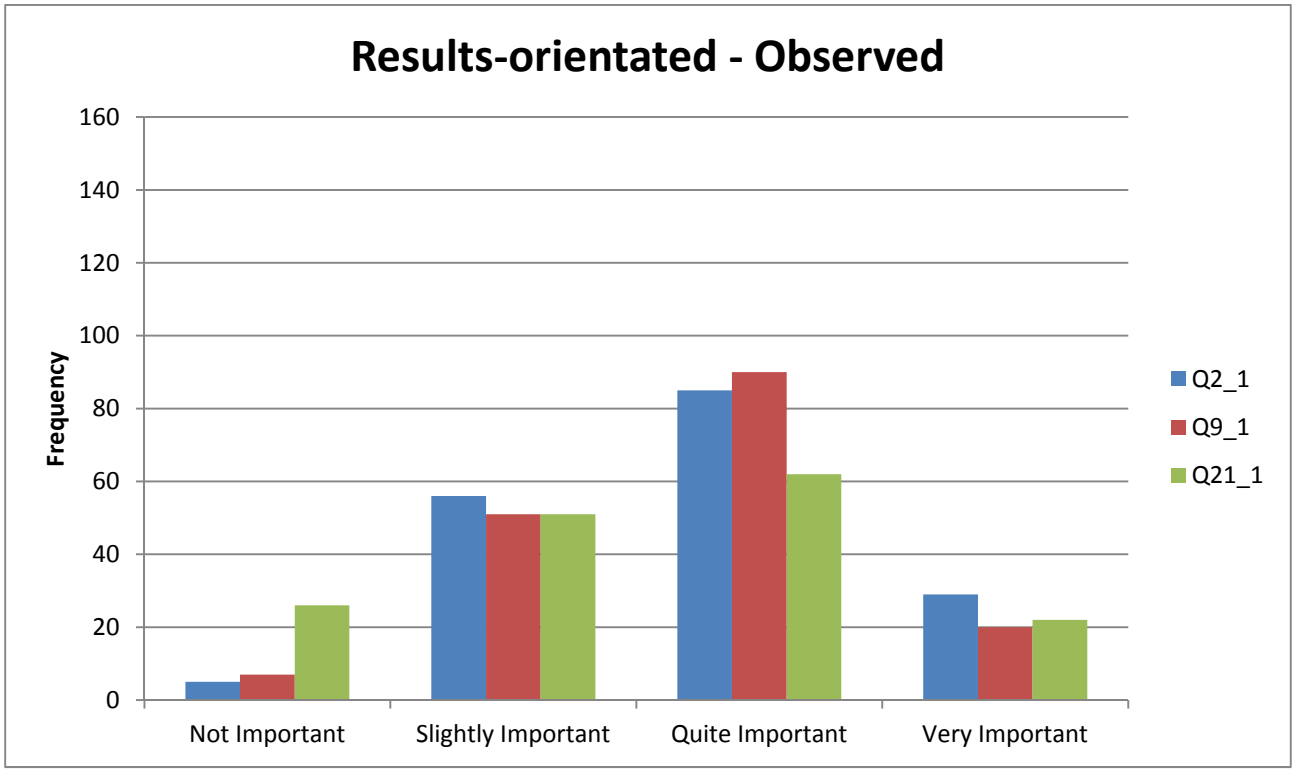

Relaxation - Expected
160
140
120
100
80
60
40
20
0
Frequency
Not Important
Slightly Important
Quite Important
Very Important
Q16_2
Q26_2

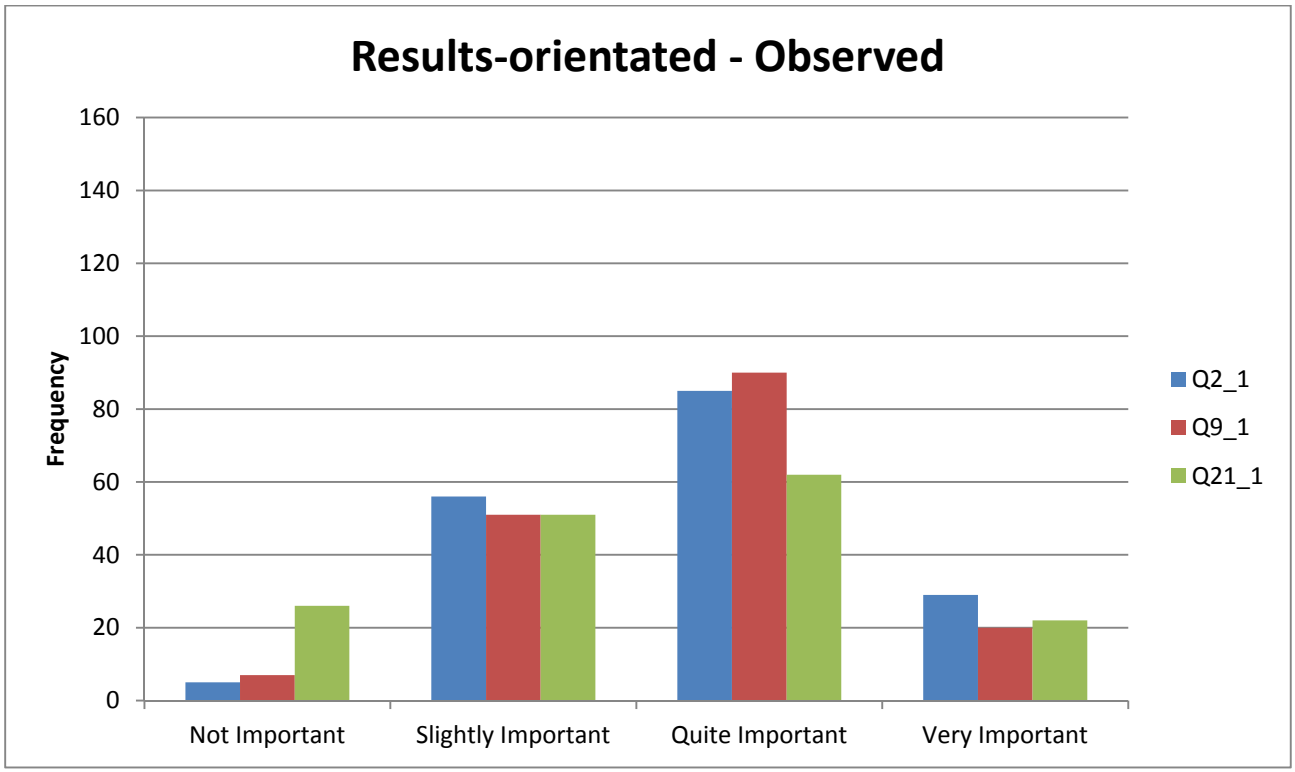

Openness - Observed
160
140
120
100
80
60
40
20
0
Frequency
Not Important
Slightly Important
Quite Important
Very Important
Q10_1
Q14_1
Q18_1
Q23_1

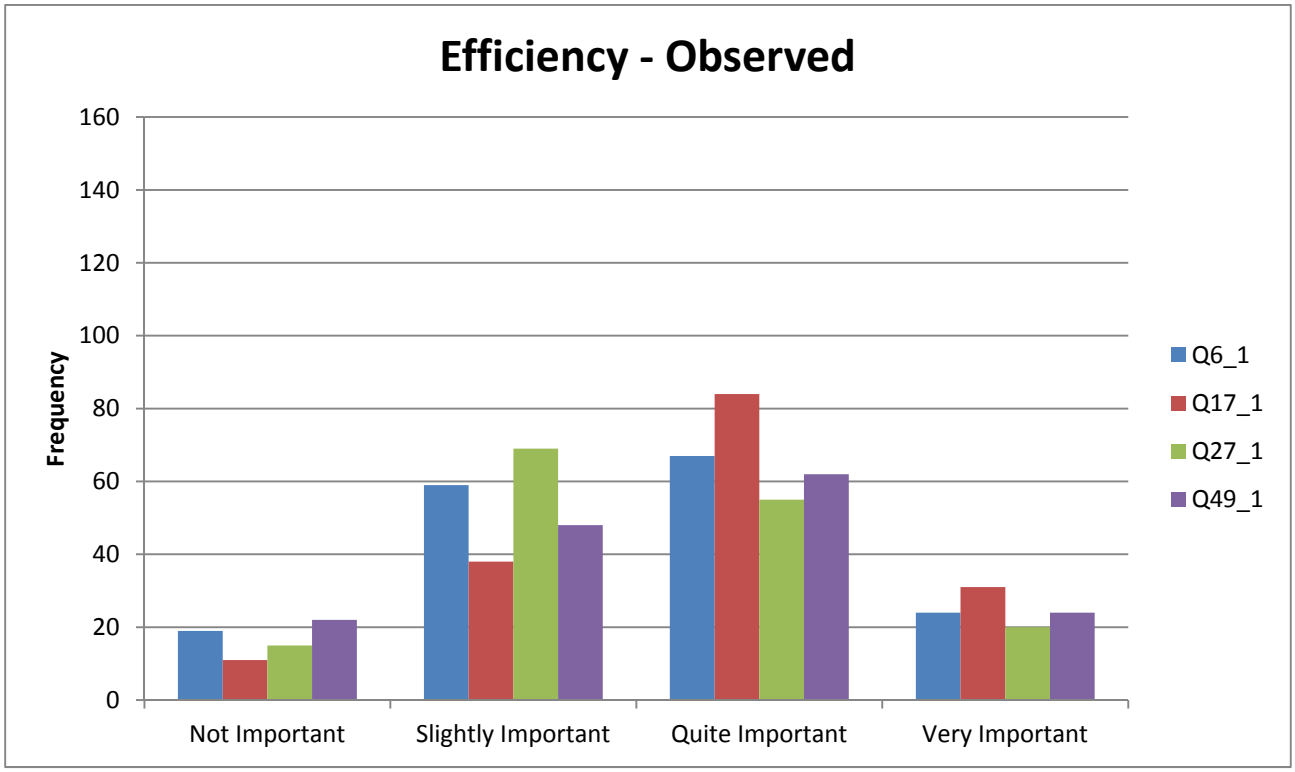

Openness - Expected
160
140
120
100
80
60
40
20
0
Frequency
Not Important
Slightly Important
Quite Important
Very Important
Q10_2
Q14_2
Q18_2
Q23_2

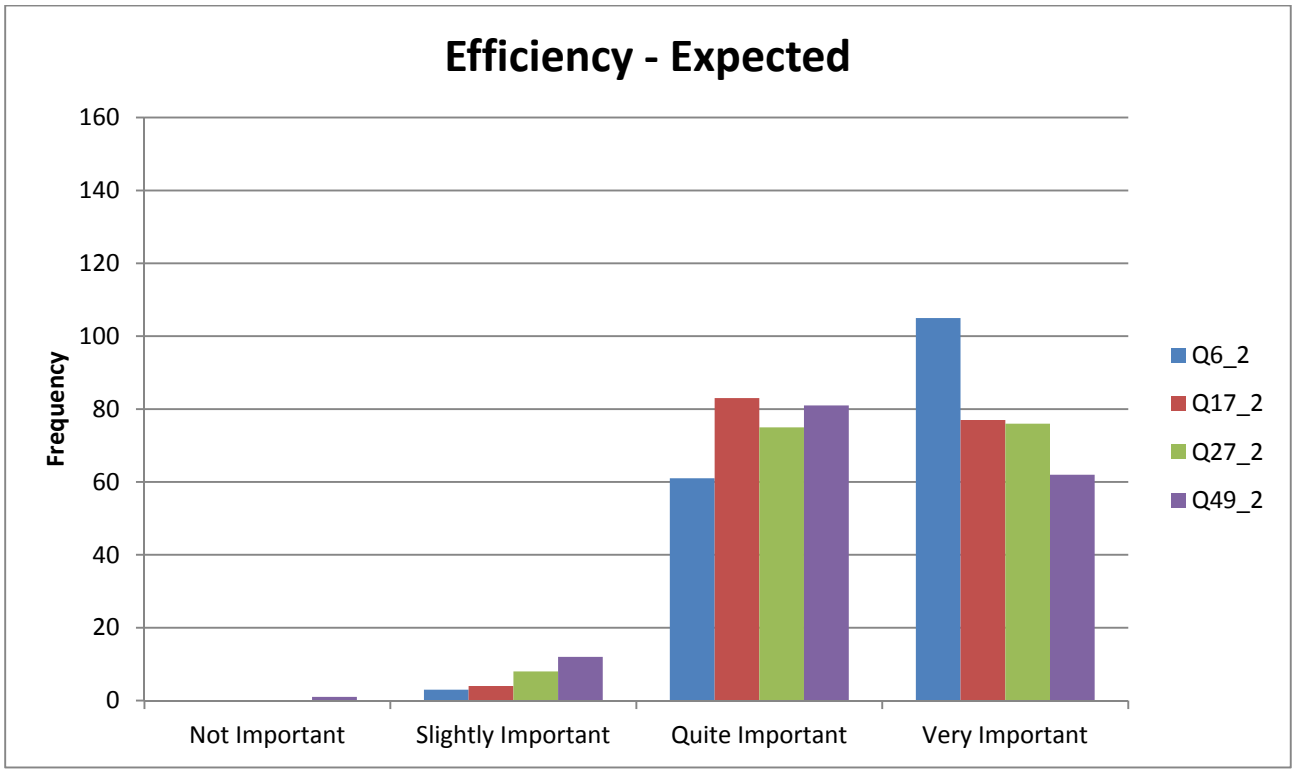

Creativity - Observed
160
140
120
100
80
60
40
20
0
Frequency
Not Important
Slightly Important
Quite Important
Very Important
Q20_1
Q29_1

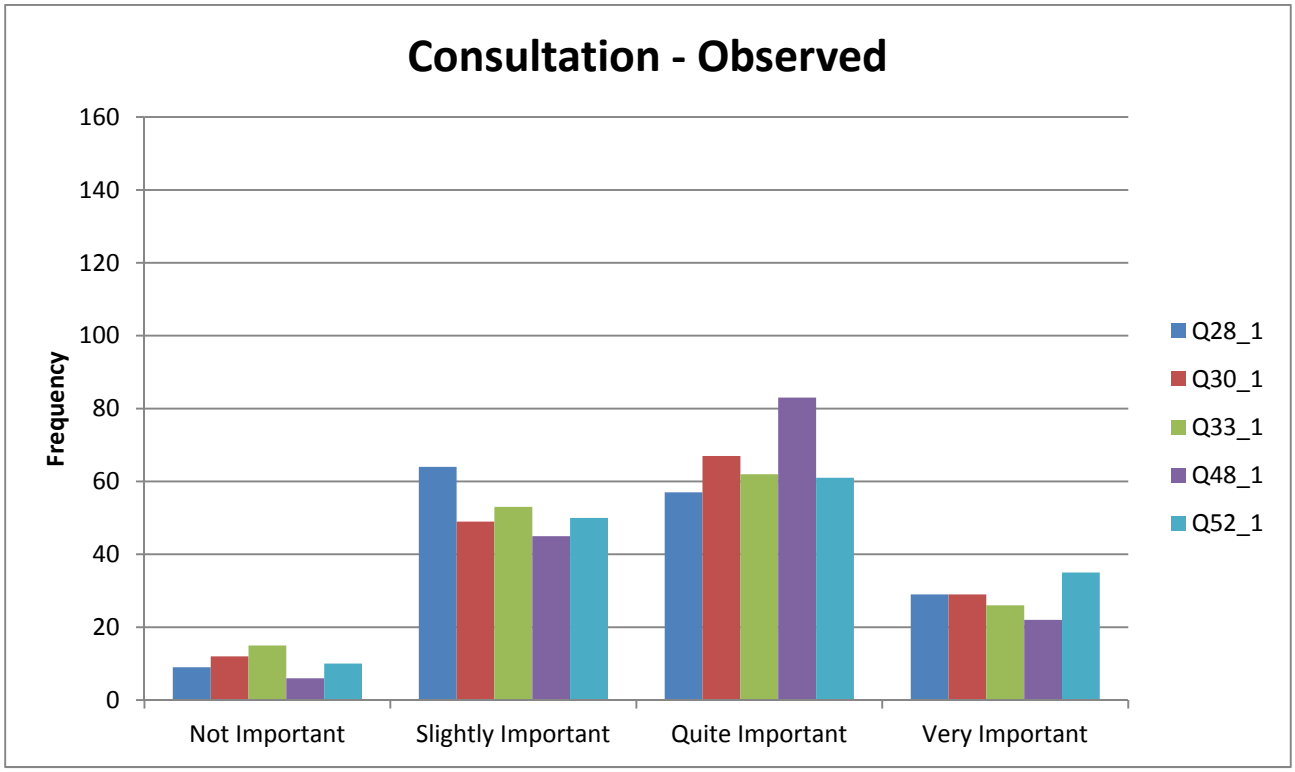

Creativity - Expected
160
140
120
100
80
60
40
20
0
Frequency
Not Important
Slightly Important
Quite Important
Very Important
Q20_2
Q29_2

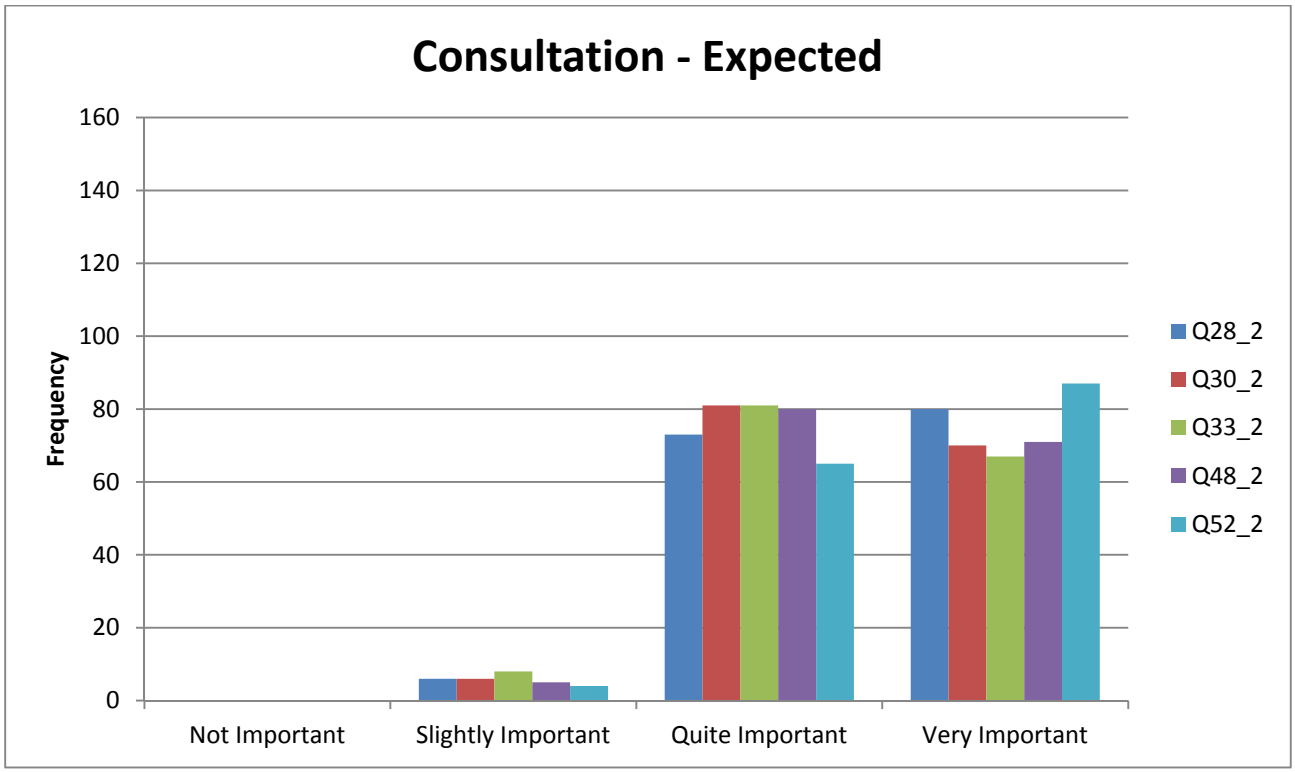

Results-orientated - Observed
160
140
120
100
80
60
40
20
0
Frequency
Not Important
Slightly Important
Quite Important
Very Important
Q2_1
Q9_1
Q21_1

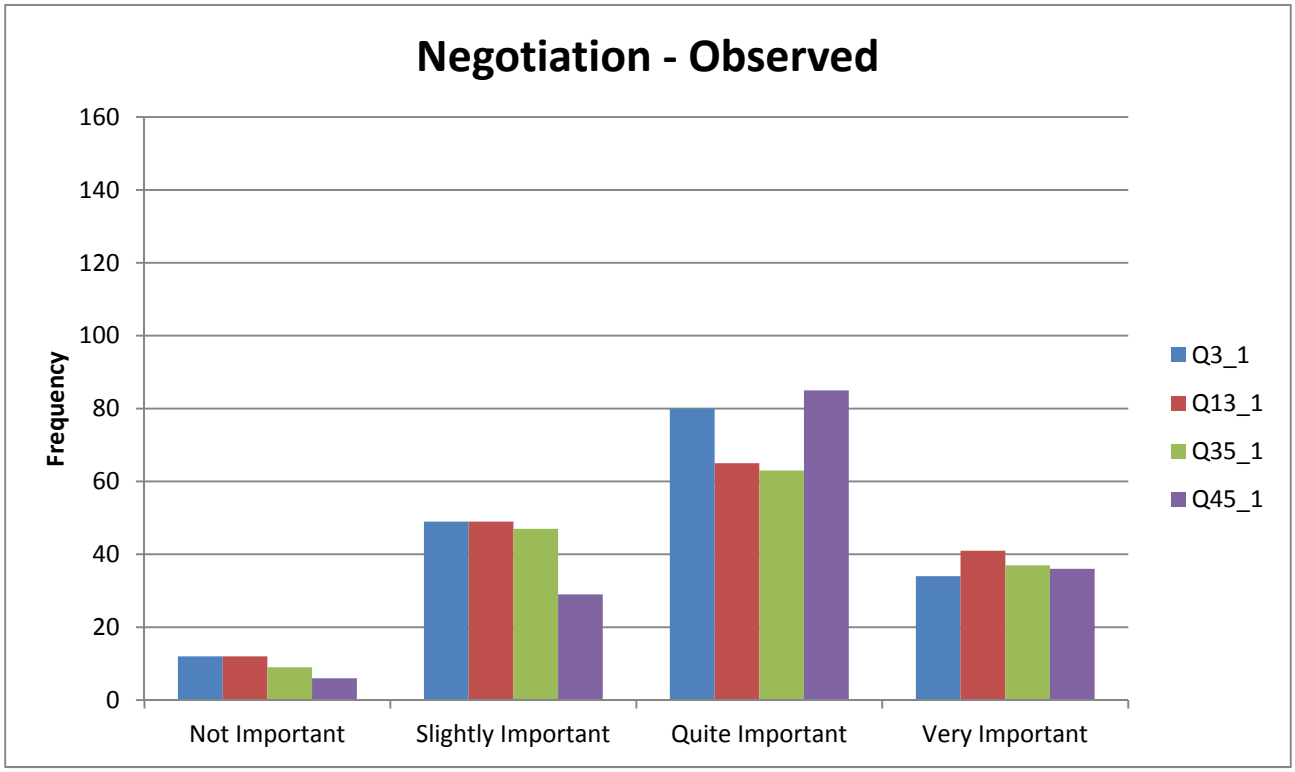

Results-orientated - Observed
160
140
120
100
80
60
40
20
0
Frequency
Not Important
Slightly Important
Quite Important
Very Important
Q2_1
Q9_1
Q21_1

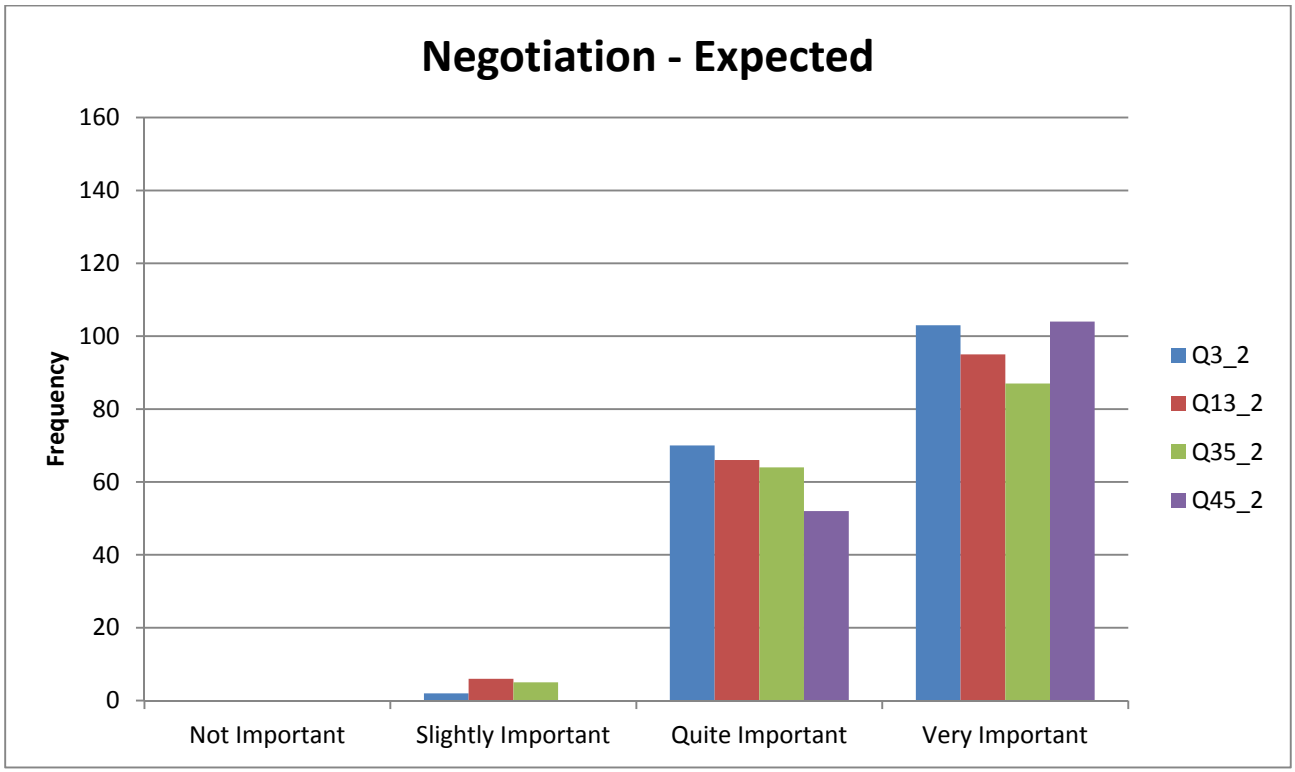

Efficiency - Observed
160
140
120
100
80
60
40
20
0
Frequency
Not Important
Slightly Important
Quite Important
Very Important
Q6_1
Q17_1
Q27_1
Q49_1

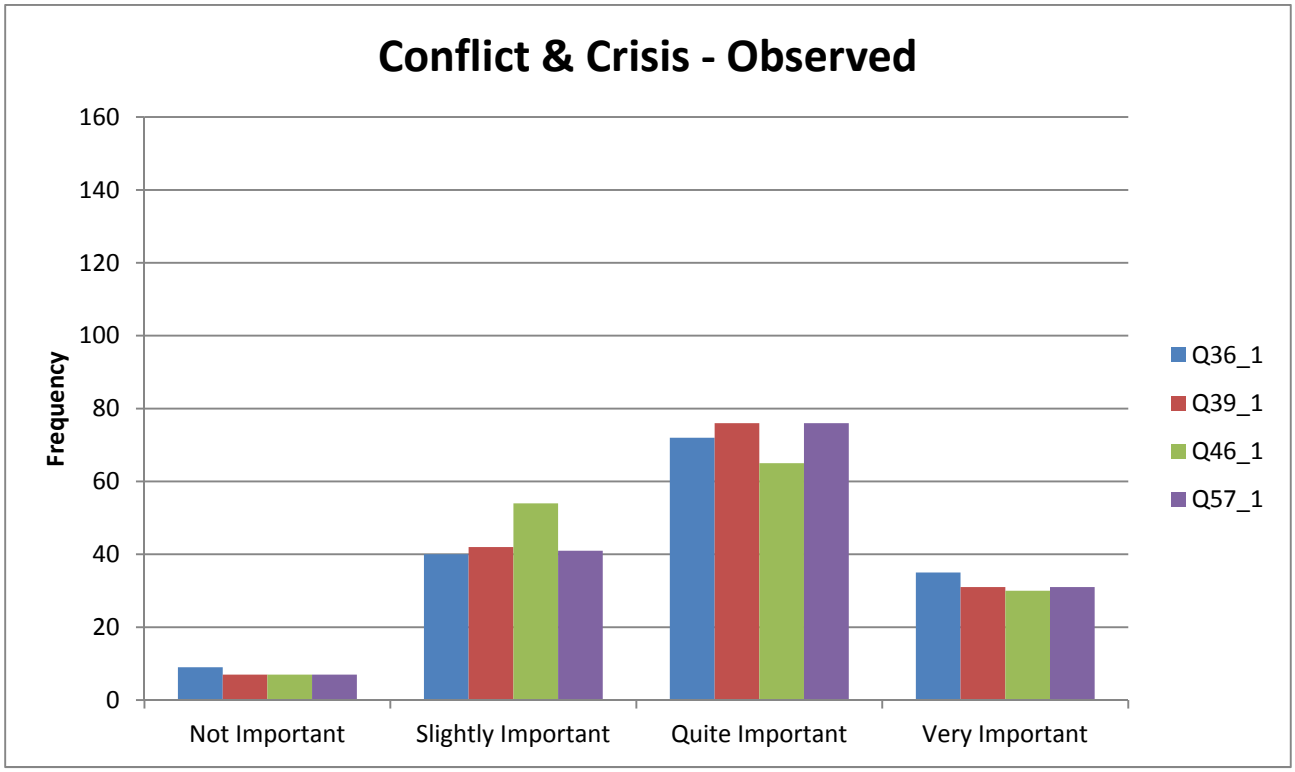

Efficiency - Expected
160
140
120
100
80
60
40
20
0
Frequency
Not Important
Slightly Important
Quite Important
Very Important
Q6_2
Q17_2
Q27_2
Q49_2

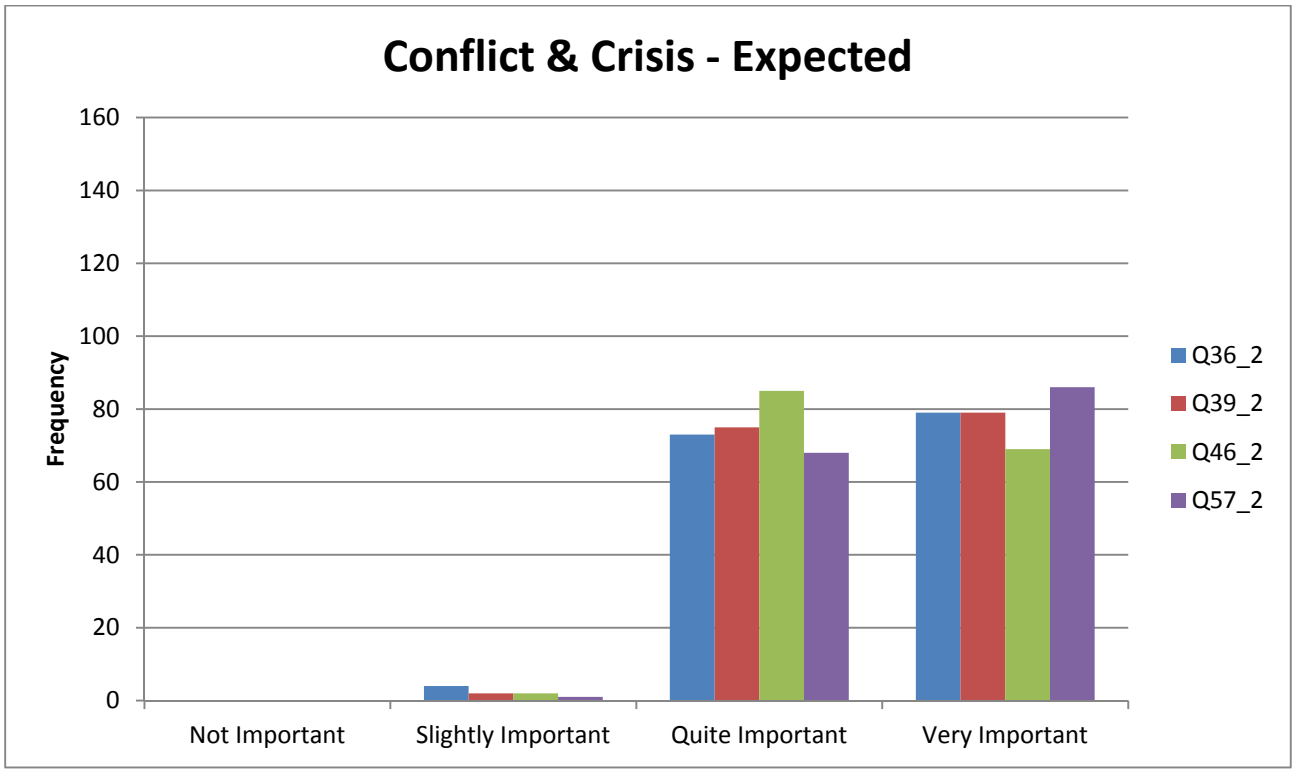

Consultation - Observed
Frequency
160
140
120
100
80
60
40
20
0
Not Important
Slightly Important
Quite Important
Very Important
Q28_1
Q30_1
Q33_1
Q48_1
Q52_1

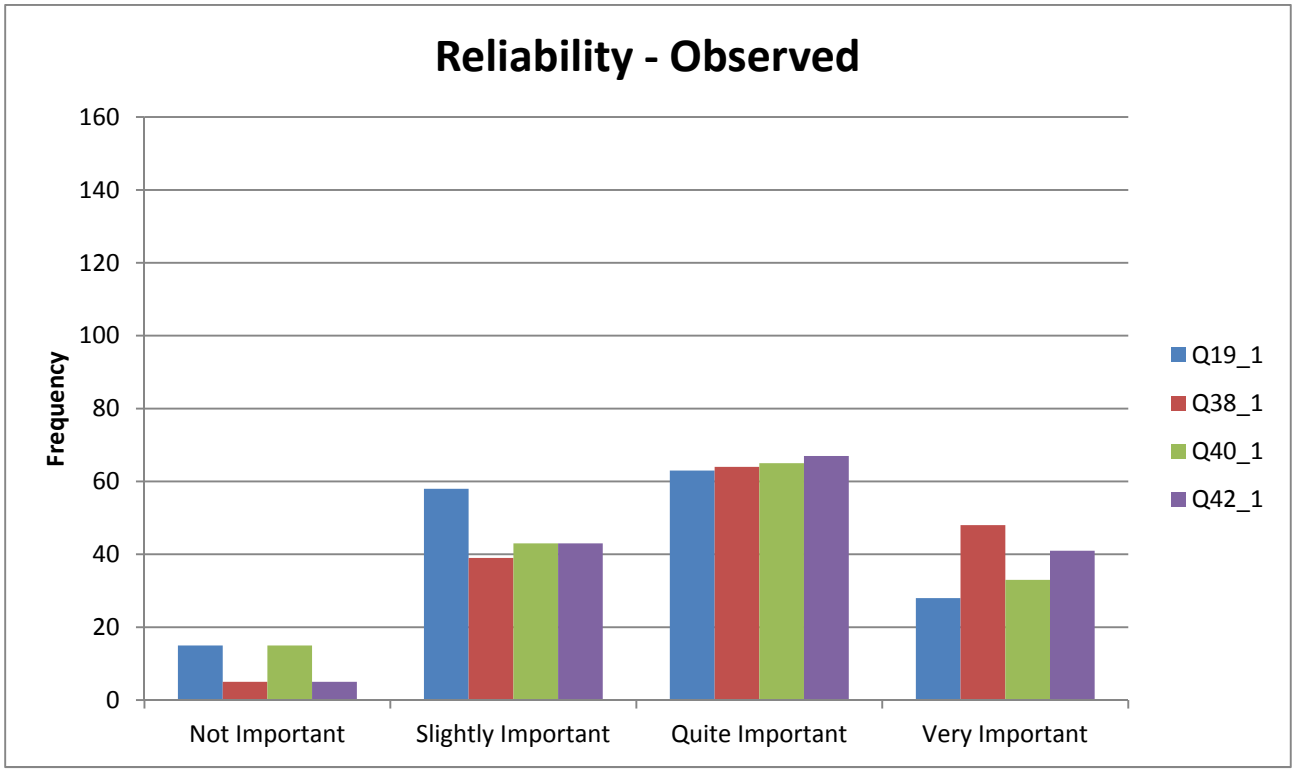

Consultation - Expected
Frequency
160
140
120
100
80
60
40
20
0
Not Important
Slightly Important
Quite Important
Very Important
Q28_2
Q30_2
Q33_2
Q48_2
Q52_2

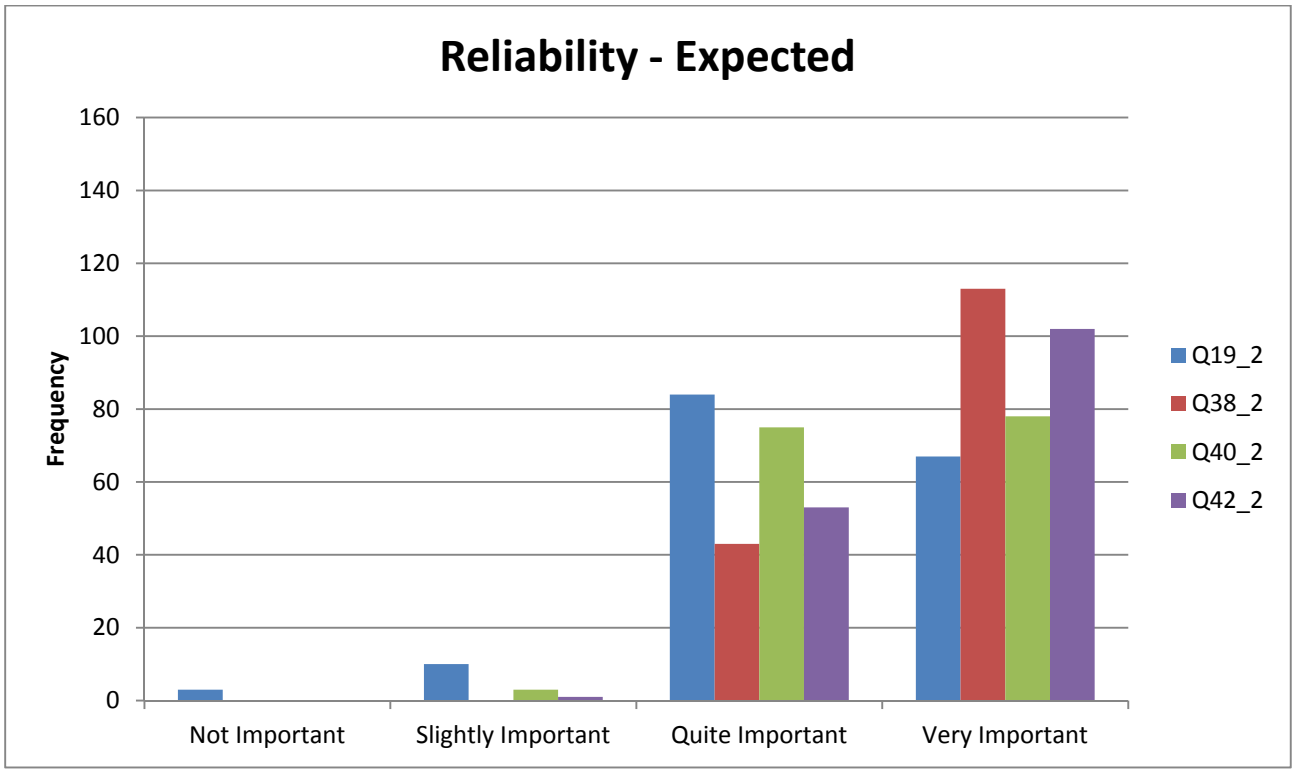

Negotiation - Observed
160
140
120
100
80
60
40
20
0
Frequency
Not Important
Slightly Important
Quite Important
Very Important
Q3_1
Q13_1
Q35_1
Q45_1

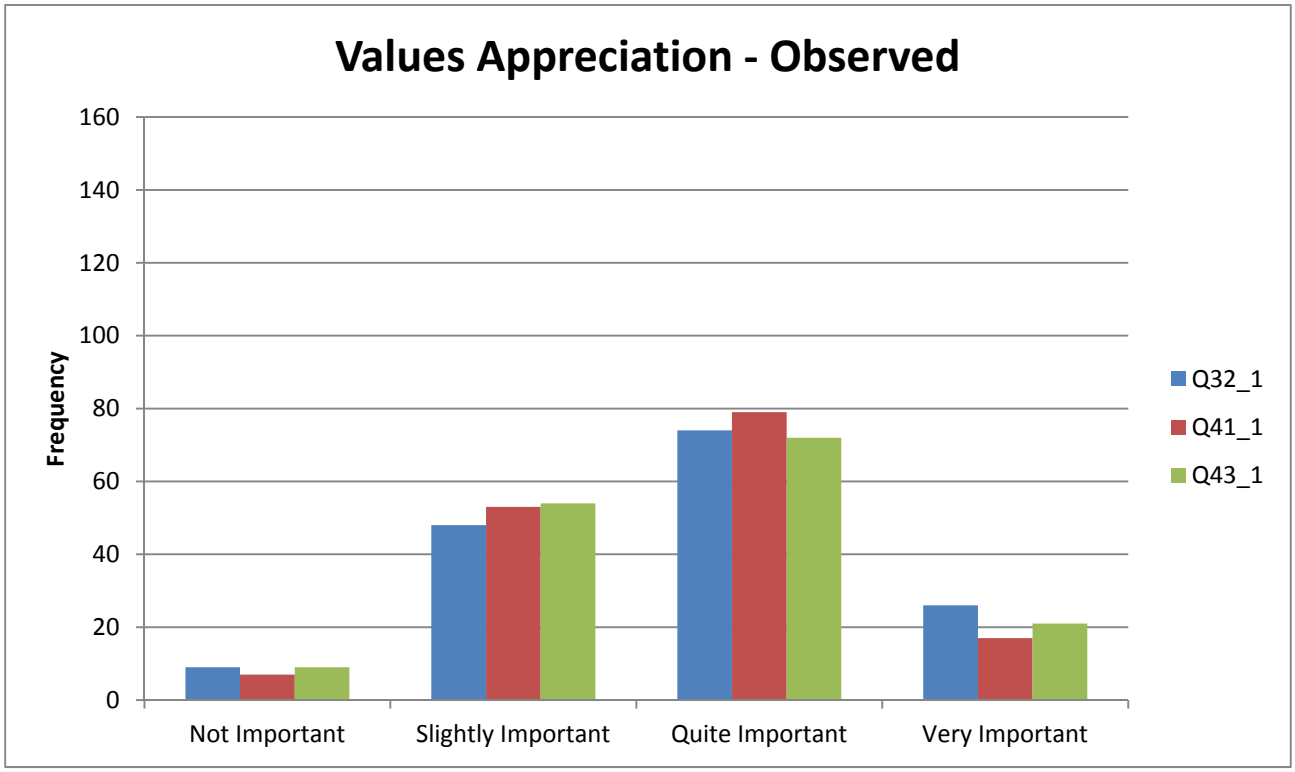

Negotiation - Expected
160
140
120
100
80
60
40
20
0
Frequency
Not Important
Slightly Important
Quite Important
Very Important
Q3_2
Q13_2
Q35_2
Q45_2

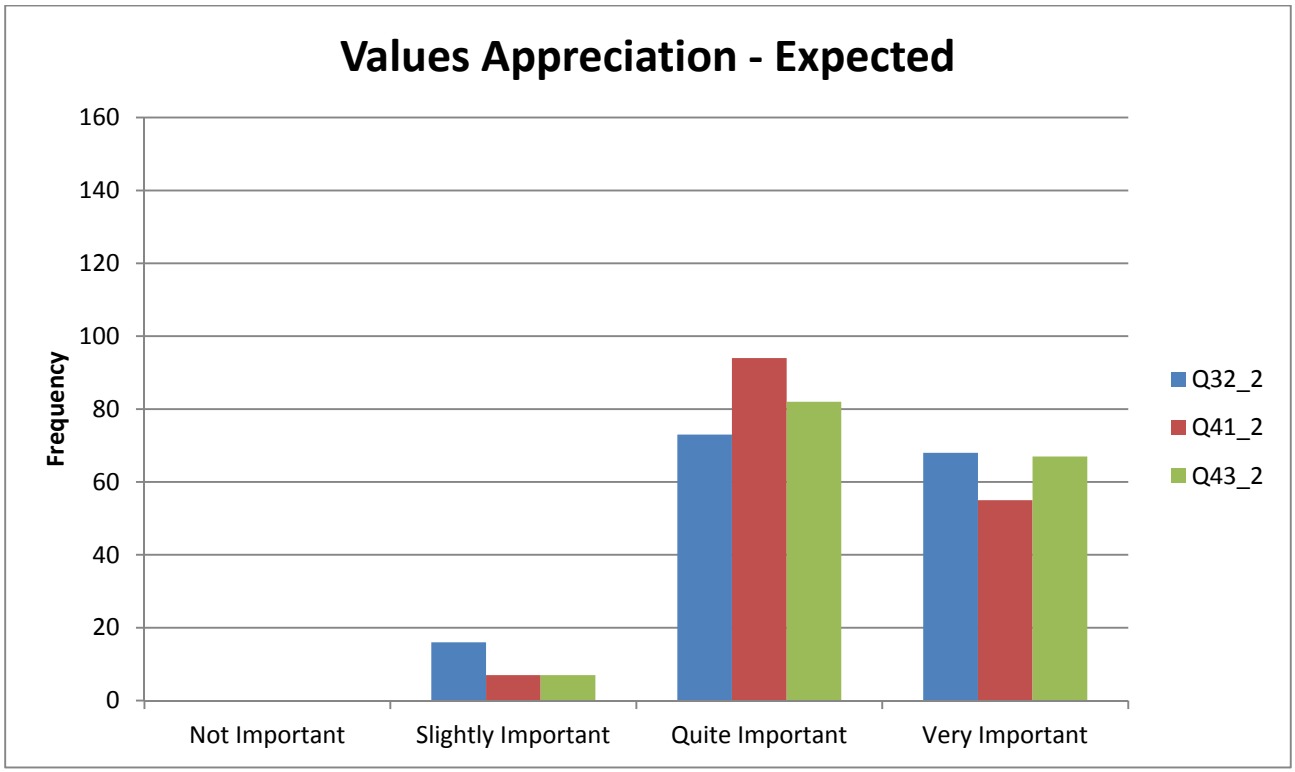

Conflict & Crisis - Observed
160
140
120
100
80
60
40
20
0
Frequency
Not Important
Slightly Important
Quite Important
Very Important
Q36_1
Q39_1
Q46_1
Q57_1

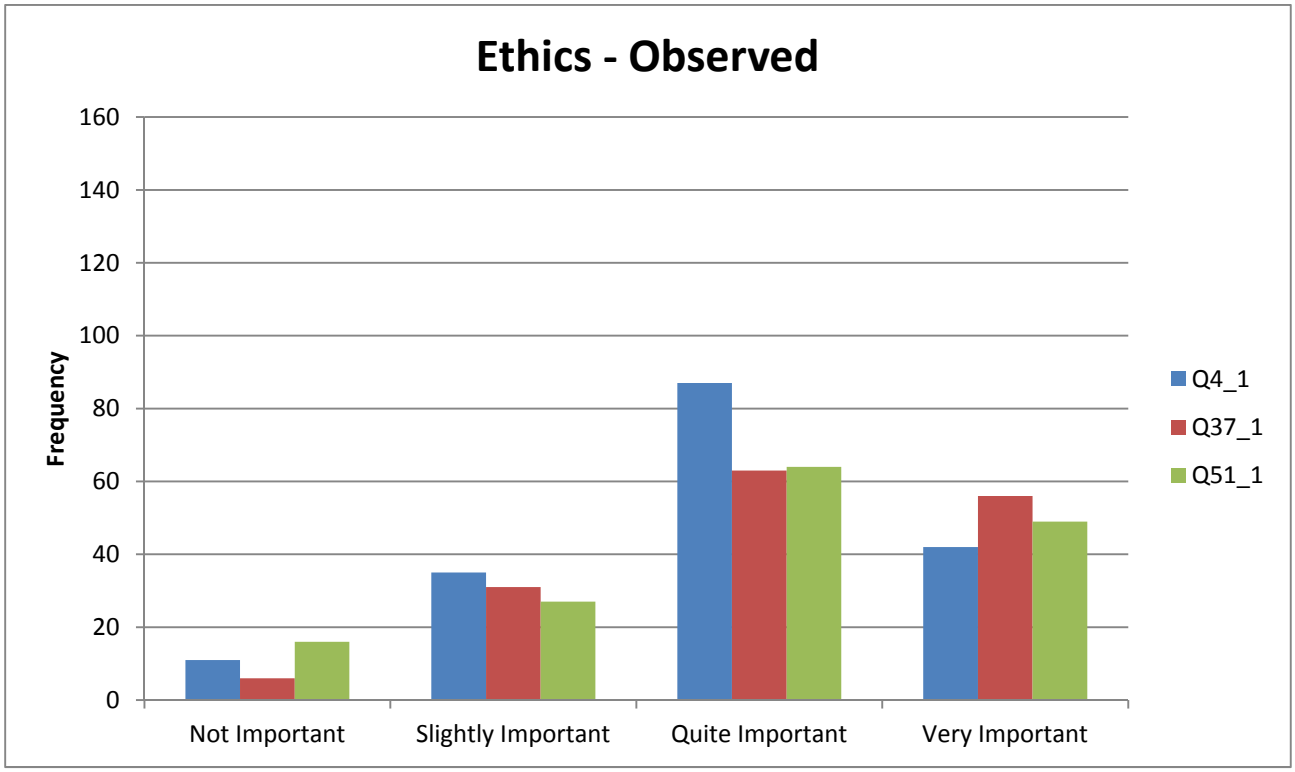

Conflict & Crisis - Expected
160
140
120
100
80
60
40
20
0
Frequency
Not Important
Slightly Important
Quite Important
Very Important
Q36_2
Q39_2
Q46_2
Q57_2

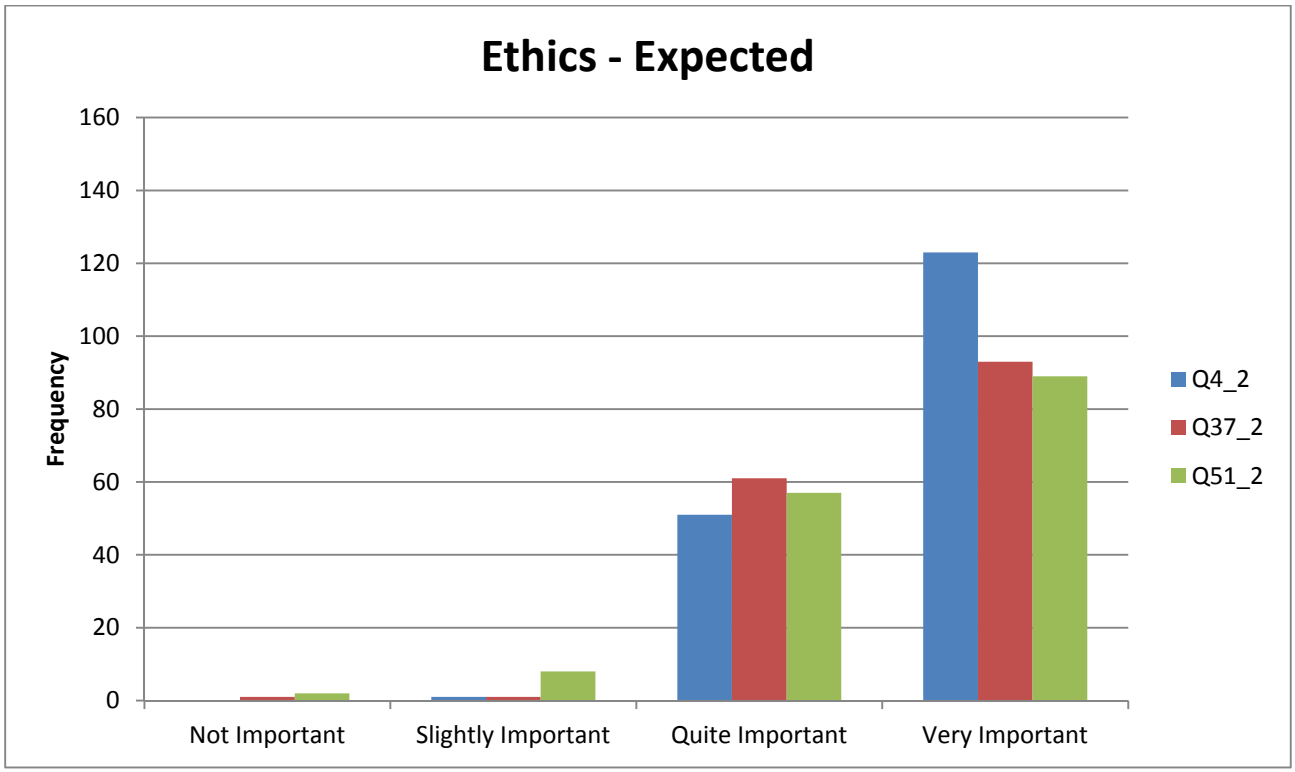

Reliability - Observed
160
140
120
100
80
60
40
20
0
Frequency
Not Important
Slightly Important
Quite Important
Very Important
Q19_1
Q38_1
Q40_1
Q42_1

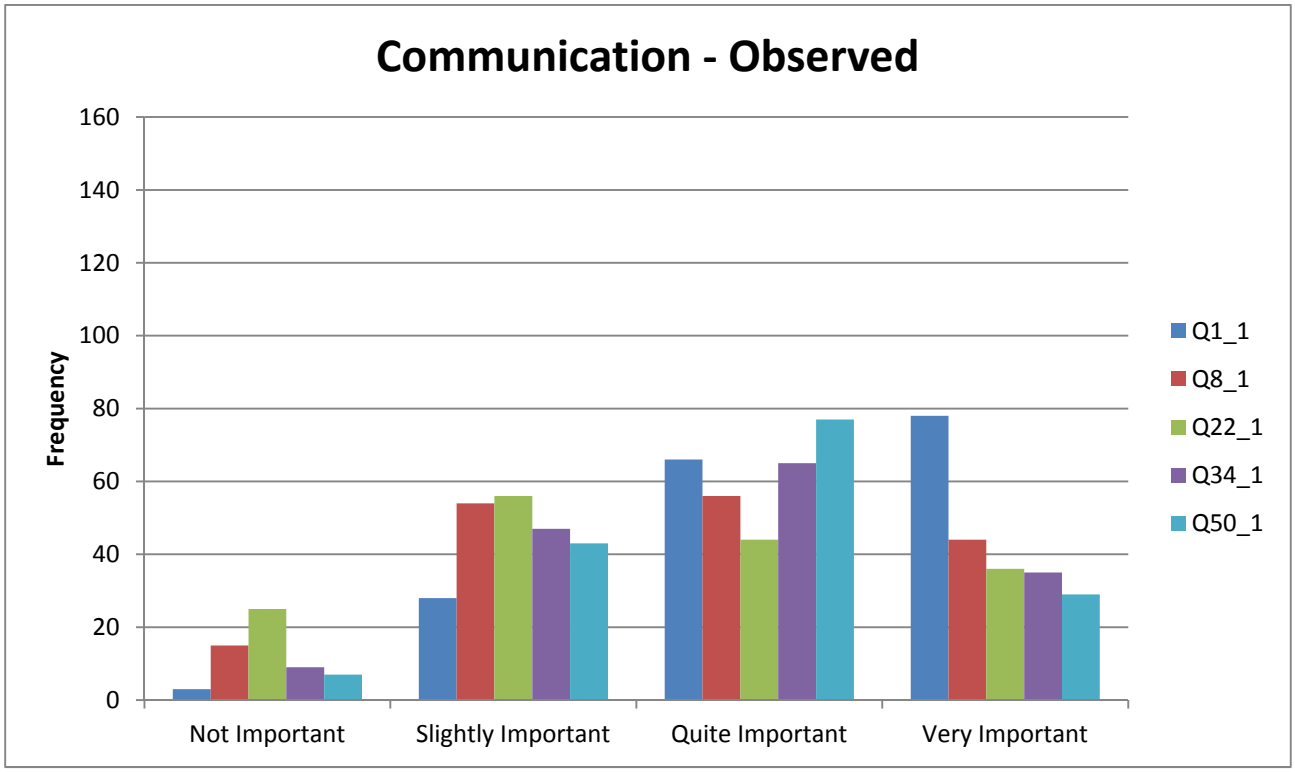

Reliability - Expected
160
140
120
100
80
60
40
20
0
Frequency
Not Important
Slightly Important
Quite Important
Very Important
Q19_2
Q38_2
Q40_2
Q42_2

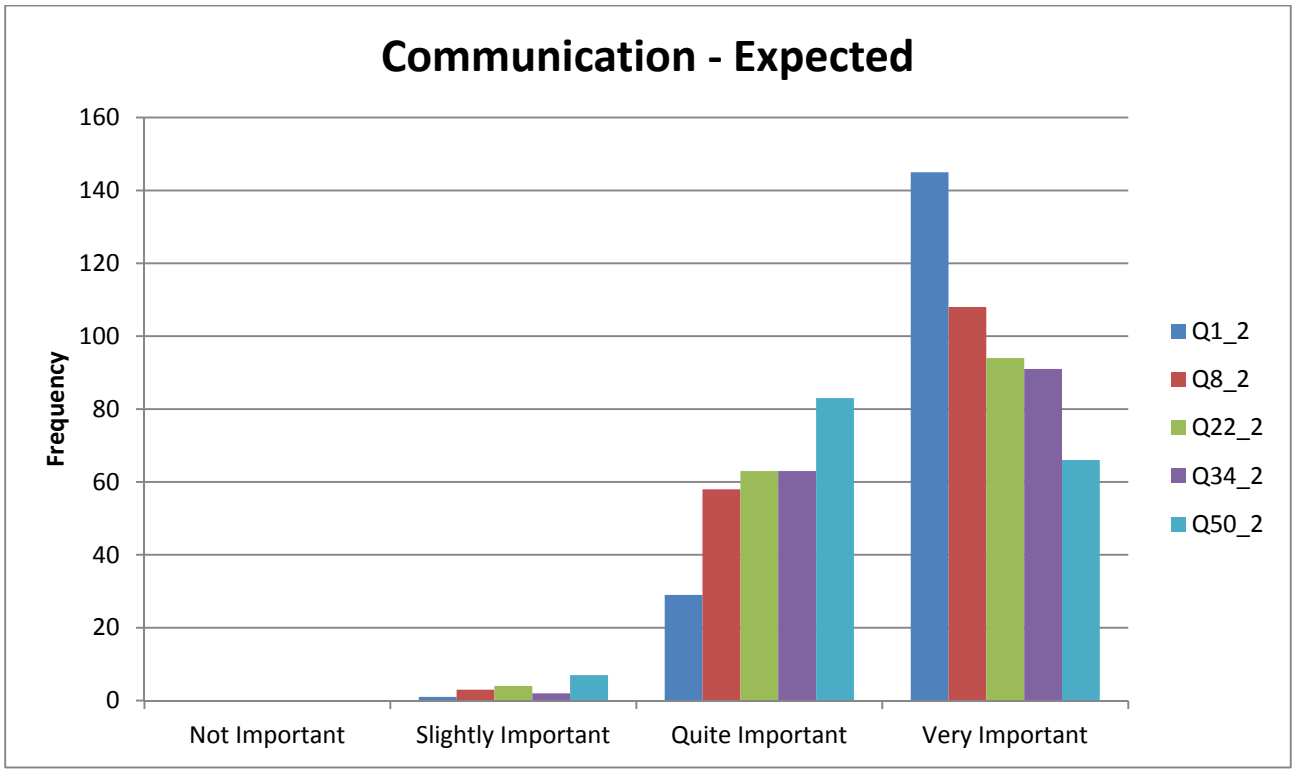

Values Appreciation - Observed
160
140
120
100
80
60
40
20
0
Frequency
Not Important
Slightly Important
Quite Important
Very Important
Q32_1
Q41_1
Q43_1


Values Appreciation - Expected
160
140
120
100
80
60
40
20
0
Frequency
Not Important
Slightly Important
Quite Important
Very Important
Q32_2
Q41_2
Q43_2


Ethics - Observed
160
140
120
100
80
60
40
20
0
Frequency
Not Important
Slightly Important
Quite Important
Very Important
Q4_1
Q37_1
Q51_1


Ethics - Expected
160
140
120
100
80
60
40
20
0
Frequency
Not Important
Slightly Important
Quite Important
Very Important
Q4_2
Q37_2
Q51_2


Communication - Observed
160
140
120
100
80
60
40
20
0
Frequency
Not Important
Slightly Important
Quite Important
Very Important
Q1_1
Q8_1
Q22_1
Q34_1
Q50_1


Communication - Expected
160
140
120
100
80
60
40
20
0
Frequency
Not Important
Slightly Important
Quite Important
Very Important
Q1_2
Q8_2
Q22_2
Q34_2
Q50_2

APPENDIX E – EFFECT SIZES FOR DEMOGRAPHICS

GENDER

Post hoc paired t-tests and effect sizes for Observed – Expected construct pairs for **Male** gender:

Constructs	n	Mean Difference (Observed – Expected)	Std. Dev. Difference	*p*-values [(a)] (in case of probability sampling)	Cohen's *d* Effect Size
Leadership	127	- 0.71	0.73	0.00 *	1.44 ▲
Engagement and Motivation	135	- 0.73	0.69	0.00 *	1.59 ▲
Self-control	134	- 0.69	0.70	0.00 *	1.33 ▲
Assertiveness	134	- 0.60	0.62	0.00 *	1.31 ▲
Relaxation	133	- 0.72	0.75	0.00 *	1.38 ▲
Openness	134	- 0.65	0.63	0.00 *	1.44 ▲
Creativity	131	- 0.80	0.72	0.00 *	1.46 ▲
Results-orientation	139	- 0.60	0.63	0.00 *	1.37 ▲
Efficiency	135	- 0.71	0.59	0.00 *	1.51 ▲
Consultation	127	- 0.63	0.66	0.00 *	1.40 ▲
Negotiation	139	- 0.64	0.59	0.00 *	1.42 ▲
Conflict and Crisis	126	- 0.57	0.61	0.00 *	1.27 ▲
Reliability	131	- 0.58	0.68	0.00 *	1.25 ▲
Values Appreciation	126	- 0.55	0.64	0.00 *	1.20 ▲
Ethics	139	- 0.52	0.66	0.00 *	1.09 ▲
Communication	139	- 0.60	0.65	0.00 *	1.33 ▲

[(a)] *p*-value yielded by paired t-test for dependent groups in the case of probability sampling

* Statistically significant on a 0.05 level

▲ Practically significant ($d \geq 0.80$)

Post hoc paired t-tests and effect sizes for Observed – Expected construct pairs for **Female** gender:

Constructs	**N**	**Mean Difference (Observed – Expected)**	**Std. Dev. Difference**	***p*-values [(a)] (in case of probability sampling)**	**Cohen's *d* Effect Size**
Leadership	32	- 0.92	0.89	0.00 *	1.35 ▲
Engagement and Motivation	34	- 0.79	0.78	0.00 *	1.36 ▲
Self-control	34	- 0.63	0.70	0.00 *	0.95 ▲
Assertiveness	34	- 0.70	0.70	0.00 *	1.19 ▲
Relaxation	34	- 0.82	0.88	0.00 *	1.36 ▲
Openness	34	- 0.73	0.73	0.00 *	1.19 ▲
Creativity	33	- 0.89	0.94	0.00 *	1.44 ▲
Results-orientation	36	- 0.78	0.86	0.00 *	1.23 ▲
Efficiency	34	- 0.94	0.83	0.00 *	1.58 ▲
Consultation	32	- 0.68	0.63	0.00 *	1.14 ▲
Negotiation	36	- 0.70	0.76	0.00 *	1.19 ▲
Conflict and Crisis	30	- 0.63	0.57	0.00 *	1.06 ▲
Reliability	33	- 0.74	0.87	0.00 *	1.22 ▲
Values Appreciation	31	- 0.56	0.63	0.00 *	0.90 ▲
Ethics	36	- 0.73	0.70	0.00 *	1.25 ▲
Communication	36	- 0.85	0.78	0.00 *	1.46 ▲

[(a)] *p*-value yielded by paired t-test for dependent groups in the case of probability sampling

* Statistically significant on a 0.05 level

▲ Practically significant ($d \geq 0.80$)

AGE

Post hoc paired t-tests and effect sizes for Observed – Expected construct pairs for age **20 to 29 years**:

Constructs	n	Mean Difference (Observed – Expected)	Std. Dev. Difference	*p*-values [(a)] (in case of probability sampling)	Cohen's *d* Effect Size
Leadership	28	- 0.65	0.77	0.00 *	1.01 ▲
Engagement and Motivation	32	- 0.67	0.64	0.00 *	1.27 ▲
Self-control	31	- 0.60	0.57	0.00 *	0.91 ▲
Assertiveness	31	- 0.62	0.69	0.00 *	1.12 ▲
Relaxation	30	- 0.85	0.89	0.00 *	1.34 ▲
Openness	31	- 0.63	0.66	0.00 *	1.02 ▲
Creativity	29	- 0.79	0.85	0.00 *	1.21 ▲
Results-orientation	35	- 0.56	0.61	0.00 *	1.13 ▲
Efficiency	32	- 0.77	0.73	0.00 *	1.42 ▲
Consultation	28	- 0.63	0.65	0.00 *	1.12 ▲
Negotiation	35	- 0.64	0.69	0.00 *	1.12 ▲
Conflict and Crisis	28	- 0.59	0.68	0.00 *	1.06 ▲
Reliability	29	- 0.52	0.66	0.00 *	0.94 ▲
Values Appreciation	28	- 0.54	0.67	0.00 *	0.96 ▲
Ethics	35	- 0.61	0.60	0.00 *	1.15 ▲
Communication	35	- 0.64	0.74	0.00 *	1.13 ▲

[(a)] *p*-value yielded by paired t-test for dependent groups in the case of probability sampling

* Statistically significant on a 0.05 level

▲ Practically significant ($d \geq 0.80$)

Post hoc paired t-tests and effect sizes for Observed – Expected construct pairs for age **30 to 39 years**:

Constructs	n	Mean Difference (Observed – Expected)	Std. Dev. Difference	*p*-values [(a)] (in case of probability sampling)	Cohen's *d* Effect Size
Leadership	46	- 1.04	0.74	0.00 *	1.99 ▲
Engagement and Motivation	49	- 0.96	0.70	0.00 *	1.88 ▲
Self-control	49	- 0.76	0.65	0.00 *	1.32 ▲
Assertiveness	49	- 0.73	0.58	0.00 *	1.52 ▲
Relaxation	49	- 0.88	0.77	0.00 *	1.43 ▲
Openness	49	- 0.89	0.68	0.00 *	1.82 ▲
Creativity	48	- 1.06	0.84	0.00 *	1.70 ▲
Results-orientation	49	- 0.94	0.70	0.00 *	1.75 ▲
Efficiency	49	- 0.91	0.61	0.00 *	1.86 ▲
Consultation	46	- 0.82	0.62	0.00 *	1.64 ▲
Negotiation	49	- 0.84	0.64	0.00 *	1.67 ▲
Conflict and Crisis	45	- 0.76	0.57	0.00 *	1.67 ▲
Reliability	48	- 0.88	0.81	0.00 *	1.65 ▲
Values Appreciation	46	- 0.74	0.69	0.00 *	1.49 ▲
Ethics	49	- 0.70	0.60	0.00 *	1.37 ▲
Communication	49	- 0.88	0.64	0.00 *	1.81 ▲

[(a)] *p*-value yielded by paired t-test for dependent groups in the case of probability sampling

* Statistically significant on a 0.05 level

▲ Practically significant ($d \geq 0.80$)

Post hoc paired t-tests and effect sizes for Observed – Expected construct pairs for age **40 to 49 years**:

Constructs	n	Mean Difference (Observed – Expected)	Std. Dev. Difference	*p*-values [(a)] (in case of probability sampling)	Cohen's *d* Effect Size
Leadership	41	- 0.78	0.78	0.00 *	1.20 ▲
Engagement and Motivation	42	- 0.87	0.74	0.00 *	1.45 ▲
Self-control	42	- 0.77	0.84	0.00 *	1.12 ▲
Assertiveness	42	- 0.67	0.59	0.00 *	1.15 ▲
Relaxation	42	- 0.75	0.76	0.00 *	1.21 ▲
Openness	42	- 0.74	0.66	0.00 *	1.32 ▲
Creativity	41	- 0.77	0.64	0.00 *	1.12 ▲
Results-orientation	44	- 0.57	0.75	0.00 *	0.93 ▲
Efficiency	42	- 0.78	0.60	0.00 *	1.35 ▲
Consultation	41	- 0.72	0.66	0.00 *	1.22 ▲
Negotiation	44	- 0.69	0.60	0.00 *	1.25 ▲
Conflict and Crisis	40	- 0.59	0.55	0.00 *	1.03 ▲
Reliability	41	- 0.67	0.70	0.00 *	1.10 ▲
Values Appreciation	40	- 0.57	0.56	0.00 *	0.94 ▲
Ethics	44	- 0.64	0.81	0.00 *	0.92 ▲
Communication	44	- 0.67	0.69	0.00 *	1.24 ▲

(a) *p*-value yielded by paired t-test for dependent groups in the case of probability sampling

* Statistically significant on a 0.05 level

▲ Practically significant ($d \geq 0.80$)

Post hoc paired t-tests and effect sizes for Observed – Expected construct pairs for age **50 to 59 years**:

Constructs	n	Mean Difference (Observed – Expected)	Std. Dev. Difference	*p*-values [(a)] (in case of probability sampling)	Cohen's *d* Effect Size
Leadership	38	- 0.88	0.76	0.00 *	1.45 ▲
Engagement and Motivation	40	- 0.88	0.72	0.00 *	1.59 ▲
Self-control	40	- 0.98	0.70	0.00 *	1.78 ▲
Assertiveness	40	- 0.80	0.71	0.00 *	1.38 ▲
Relaxation	40	- 0.89	0.77	0.00 *	1.39 ▲
Openness	40	- 0.74	0.62	0.00 *	1.43 ▲
Creativity	40	- 1.04	0.74	0.00 *	1.63 ▲
Results-orientation	41	- 0.79	0.58	0.00 *	1.64 ▲
Efficiency	40	- 0.90	0.68	0.00 *	1.46 ▲
Consultation	38	- 0.75	0.73	0.00 *	1.36 ▲
Negotiation	41	- 0.76	0.62	0.00 *	1.41 ▲
Conflict and Crisis	37	- 0.72	0.66	0.00 *	1.26 ▲
Reliability	40	- 0.72	0.70	0.00 *	1.22 ▲
Values Appreciation	37	- 0.67	0.65	0.00 *	1.21 ▲
Ethics	41	- 0.69	0.67	0.00 *	1.25 ▲
Communication	41	- 0.75	0.68	0.00 *	1.33 ▲

(a) *p*-value yielded by paired t-test for dependent groups in the case of probability sampling

* Statistically significant on a 0.05 level

▲ Practically significant ($d \geq 0.80$)

Post hoc paired t-tests and effect sizes for Observed – Expected construct pairs for age **60 years and above**:

Constructs	**n**	**Mean Difference (Observed – Expected)**	**Std. Dev. Difference**	***p*-values [(a)] (in case of probability sampling)**	**Cohen's *d* Effect Size**
Leadership	6	- 0.83	0.80	0.05 *	1.50 ▲
Engagement and Motivation	6	- 0.29	0.43	0.16	0.58
Self-control	6	- 0.42	0.20	0.00 *	1.29 ▲
Assertiveness	6	- 0.50	0.45	0.04 *	1.15 ▲
Relaxation	6	- 0.83	0.52	0.01 *	1.90 ▲
Openness	6	- 0.33	0.38	0.08	0.83 ▲
Creativity	6	- 0.58	0.38	0.01 *	1.12 ▲
Results-orientation	6	- 0.50	0.62	0.11	1.18 ▲
Efficiency	6	- 0.58	0.30	0.01 *	1.56 ▲
Consultation	6	- 0.53	0.33	0.01 *	1.27 ▲
Negotiation	6	- 0.54	0.49	0.04 *	1.28 ▲
Conflict and Crisis	6	- 0.50	0.35	0.02 *	0.89 ▲
Reliability	6	- 0.50	0.52	0.07	0.98 ▲
Values Appreciation	6	- 0.67	0.60	0.04 *	1.36 ▲
Ethics	6	- 0.22	0.17	0.03 *	0.63
Communication	6	- 0.40	0.42	0.07	1.12 ▲

(a) *p*-value yielded by paired t-test for dependent groups in the case of probability sampling

* Statistically significant on a 0.05 level

▲ Practically significant ($d \geq 0.80$)

HIGHEST QUALIFICATION

Post hoc paired t-tests and effect sizes for Observed – Expected construct pairs for highest qualification **Matric Certificate**:

Constructs	n	Mean Difference (Observed – Expected)	Std. Dev. Difference	*p*-values [(a)] (in case of probability sampling)	Cohen's *d* Effect Size
Leadership	10	- 0.43	0.97	0.20	0.62
Engagement and Motivation	10	- 0.46	0.91	0.14	0.77
Self-control	10	- 0.50	0.94	0.13	0.78
Assertiveness	10	- 0.48	0.89	0.12	0.68
Relaxation	10	- 0.45	1.01	0.19	0.63
Openness	10	- 0.48	0.89	0.13	0.70
Creativity	10	- 0.50	0.94	0.13	0.69
Results-orientation	10	- 0.53	0.83	0.07	0.83 ▲
Efficiency	10	- 0.51	0.89	0.11	0.77
Consultation	10	- 0.46	0.78	0.10	0.78
Negotiation	10	- 0.48	0.73	0.07	0.76
Conflict and Crisis	9	- 0.28	0.51	0.14	0.51
Reliability	10	- 0.50	1.03	0.16	0.65
Values Appreciation	9	- 0.22	0.44	0.17	0.40
Ethics	10	- 0.43	0.96	0.19	0.60
Communication	10	- 0.47	0.96	0.16	0.68

[(a)] *p*-value yielded by paired t-test for dependent groups in the case of probability sampling

▲ Practically significant ($d \geq 0.80$)

Post hoc paired t-tests and effect sizes for Observed – Expected construct pairs for highest qualification **diploma**:

Constructs	n	Mean Difference (Observed – Expected)	Std. Dev. Difference	*p*-values [(a)] (in case of probability sampling)	Cohen's *d* Effect Size
Leadership	24	- 0.94	0.63	0.00 *	1.78 ▲
Engagement and Motivation	25	- 0.85	0.73	0.00 *	1.52 ▲
Self-control	25	- 0.80	0.63	0.00 *	1.59 ▲
Assertiveness	25	- 0.76	0.57	0.00 *	1.55 ▲
Relaxation	25	- 0.82	0.64	0.00 *	1.51 ▲
Openness	25	- 0.76	0.65	0.00 *	1.59 ▲
Creativity	25	- 0.94	0.67	0.00 *	1.54 ▲
Results-orientation	26	- 0.70	0.64	0.00 *	1.25 ▲
Efficiency	25	- 0.82	0.58	0.00 *	1.56 ▲
Consultation	24	- 0.82	0.56	0.00 *	1.63 ▲
Negotiation	26	- 0.66	0.52	0.00 *	1.33 ▲
Conflict and Crisis	24	- 0.65	0.58	0.00 *	1.17 ▲
Reliability	25	- 0.87	0.81	0.00 *	1.47 ▲
Values Appreciation	24	- 0.69	0.57	0.00 *	1.51 ▲
Ethics	26	- 0.65	0.61	0.00 *	1.34 ▲
Communication	26	- 0.79	0.70	0.00 *	1.43 ▲

[(a)] *p*-value yielded by paired t-test for dependent groups in the case of probability sampling

* Statistically significant on a 0.05 level

▲ Practically significant ($d \geq 0.80$)

Post hoc paired t-tests and effect sizes for Observed – Expected construct pairs for highest qualification **Bachelor's degree**:

Constructs	**n**	**Mean Difference (Observed – Expected)**	**Std. Dev. Difference**	***p*-values [(a)] (in case of probability sampling)**	**Cohen's *d* Effect Size**
Leadership	64	- 0.81	0.79	0.00 *	1.29 ▲
Engagement and Motivation	70	- 0.83	0.66	0.00 *	1.56 ▲
Self-control	69	- 0.79	0.69	0.00 *	1.23 ▲
Assertiveness	69	- 0.70	0.65	0.00 *	1.28 ▲
Relaxation	68	- 0.90	0.77	0.00 *	1.44 ▲
Openness	69	- 0.76	0.64	0.00 *	1.36 ▲
Creativity	66	- 0.86	0.80	0.00 *	1.28 ▲
Results-orientation	75	- 0.62	0.66	0.00 *	1.17 ▲
Efficiency	70	- 0.85	0.64	0.00 *	1.53 ▲
Consultation	64	- 0.70	0.65	0.00 *	1.24 ▲
Negotiation	75	- 0.77	0.66	0.00 *	1.39 ▲
Conflict and Crisis	64	- 0.69	0.62	0.00 *	1.27 ▲
Reliability	66	- 0.68	0.72	0.00 *	1.21 ▲
Values Appreciation	64	- 0.67	0.67	0.00 *	1.22 ▲
Ethics	75	- 0.65	0.65	0.00 *	1.13 ▲
Communication	75	- 0.71	0.69	0.00 *	1.26 ▲

[(a)] *p*-value yielded by paired t-test for dependent groups in the case of probability sampling

* Statistically significant on a 0.05 level

▲ Practically significant ($d \geq 0.80$)

Post hoc paired t-tests and effect sizes for Observed – Expected construct pairs for highest qualification **Master's degree**:

Constructs	n	Mean Difference (Observed – Expected)	Std. Dev. Difference	*p*-values [(a)] (in case of probability sampling)	Cohen's *d* Effect Size
Leadership	53	- 0.97	0.75	0.00 *	1.69 ▲
Engagement and Motivation	55	- 0.93	0.71	0.00 *	1.68 ▲
Self-control	55	- 0.76	0.71	0.00 *	1.23 ▲
Assertiveness	55	- 0.75	0.62	0.00 *	1.35 ▲
Relaxation	55	- 0.86	0.82	0.00 *	1.36 ▲
Openness	55	- 0.78	0.65	0.00 *	1.49 ▲
Creativity	55	- 1.06	0.74	0.00 *	1.71 ▲
Results-orientation	55	- 0.91	0.68	0.00 *	1.68 ▲
Efficiency	55	- 0.88	0.64	0.00 *	1.58 ▲
Consultation	53	- 0.81	0.68	0.00 *	1.51 ▲
Negotiation	55	- 0.75	0.62	0.00 *	1.39 ▲
Conflict and Crisis	51	- 0.73	0.60	0.00 *	1.40 ▲
Reliability	55	- 0.73	0.66	0.00 *	1.27 ▲
Values Appreciation	52	- 0.67	0.64	0.00 *	1.16 ▲
Ethics	55	- 0.72	0.67	0.00 *	1.25 ▲
Communication	55	- 0.80	0.61	0.00 *	1.59 ▲

[(a)] *p*-value yielded by paired t-test for dependent groups in the case of probability sampling

* Statistically significant on a 0.05 level

▲ Practically significant ($d \geq 0.80$)

Post hoc paired t-tests and effect sizes for Observed – Expected construct pairs for highest qualification **Doctorate**:

Constructs	n	Mean Difference (Observed – Expected)	Std. Dev. Difference	*p*-values [(a)] (in case of probability sampling)	Cohen's *d* Effect Size
Leadership	8	- 0.78	0.78	0.03 *	1.44 ▲
Engagement and Motivation	9	- 0.81	0.73	0.01 *	1.95 ▲
Self-control	9	- 0.89	0.70	0.01 *	1.60 ▲
Assertiveness	9	- 0.58	0.38	0.00 *	1.81 ▲
Relaxation	9	- 0.72	0.67	0.01 *	1.46 ▲
Openness	9	- 0.72	0.49	0.00 *	1.91 ▲
Creativity	8	- 0.88	0.64	0.01 *	1.35 ▲
Results-orientation	9	- 0.63	0.59	0.01 *	1.76 ▲
Efficiency	9	- 0.89	0.53	0.00 *	2.03 ▲
Consultation	8	- 0.55	0.61	0.04 *	1.46 ▲
Negotiation	9	- 0.83	0.59	0.00 *	1.96 ▲
Conflict and Crisis	8	- 0.50	0.52	0.03 *	1.11 ▲
Reliability	8	- 0.56	0.42	0.01 *	1.77 ▲
Values Appreciation	8	- 0.54	0.71	0.07	0.98 ▲
Ethics	9	- 0.41	0.57	0.07	0.78
Communication	9	- 0.67	0.57	0.01 *	1.80 ▲

[(a)] *p*-value yielded by paired t-test for dependent groups in the case of probability sampling

* Statistically significant on a 0.05 level

▲ Practically significant ($d \geq 0.80$)

YEARS IN PROJECTS

Post hoc paired t-tests and effect sizes for Observed – Expected construct pairs for **less than 5 years** in projects:

Constructs	n	Mean Difference (Observed – Expected)	Std. Dev. Difference	*p*-values [(a)] (in case of probability sampling)	Cohen's *d* Effect Size
Leadership	36	- 0.63	0.72	0.00 *	1.05 ▲
Engagement and Motivation	40	- 0.71	0.69	0.00 *	1.37 ▲
Self-control	39	- 0.64	0.60	0.00 *	1.01 ▲
Assertiveness	39	- 0.57	0.59	0.00 *	1.06 ▲
Relaxation	39	- 0.72	0.78	0.00 *	1.14 ▲
Openness	39	- 0.65	0.61	0.00 *	1.10 ▲
Creativity	37	- 0.70	0.79	0.00 *	1.08 ▲
Results-orientation	42	- 0.61	0.66	0.00 *	1.11 ▲
Efficiency	40	- 0.77	0.67	0.00 *	1.46 ▲
Consultation	36	- 0.61	0.63	0.00 *	1.05 ▲
Negotiation	42	- 0.70	0.69	0.00 *	1.24 ▲
Conflict and Crisis	36	- 0.63	0.71	0.00 *	1.15 ▲
Reliability	37	- 0.56	0.69	0.00 *	1.03 ▲
Values Appreciation	36	- 0.48	0.62	0.00 *	0.88 ▲
Ethics	42	- 0.56	0.62	0.00 *	1.01 ▲
Communication	42	- 0.63	0.68	0.00 *	1.17 ▲

[(a)] *p*-value yielded by paired t-test for dependent groups in the case of probability sampling

* Statistically significant on a 0.05 level

▲ Practically significant ($d \geq 0.80$)

Post hoc paired t-tests and effect sizes for Observed – Expected construct pairs for **5 to 10 years** in projects:

Constructs	n	Mean Difference (Observed – Expected)	Std. Dev. Difference	*p*-values [(a)] (in case of probability sampling)	Cohen's *d* Effect Size
Leadership	38	- 0.99	0.75	0.00 *	1.81 ▲
Engagement and Motivation	41	- 0.93	0.69	0.00 *	1.66 ▲
Self-control	41	- 0.77	0.72	0.00 *	1.20 ▲
Assertiveness	41	- 0.74	0.59	0.00 *	1.44 ▲
Relaxation	40	- 0.85	0.76	0.00 *	1.36 ▲
Openness	41	- 0.77	0.73	0.00 *	1.40 ▲
Creativity	39	- 0.99	0.78	0.00 *	1.55 ▲
Results-orientation	42	- 0.74	0.55	0.00 *	1.48 ▲
Efficiency	41	- 0.78	0.58	0.00 *	1.50 ▲
Consultation	38	- 0.86	0.62	0.00 *	1.68 ▲
Negotiation	42	- 0.68	0.57	0.00 *	1.32 ▲
Conflict and Crisis	38	- 0.69	0.55	0.00 *	1.34 ▲
Reliability	39	- 0.81	0.74	0.00 *	1.42 ▲
Values Appreciation	38	- 0.79	0.67	0.00 *	1.45 ▲
Ethics	42	- 0.71	0.64	0.00 *	1.20 ▲
Communication	42	- 0.90	0.67	0.00 *	1.63 ▲

[(a)] *p*-value yielded by paired t-test for dependent groups in the case of probability sampling

* Statistically significant on a 0.05 level

▲ Practically significant ($d \geq 0.80$)

Post hoc paired t-tests and effect sizes for Observed – Expected construct pairs for **11 to 15 years** in projects:

Constructs	n	Mean Difference (Observed – Expected)	Std. Dev. Difference	*p*-values [(a)] (in case of probability sampling)	Cohen's *d* Effect Size
Leadership	25	- 0.91	0.87	0.00 *	1.36 ▲
Engagement and Motivation	26	- 0.82	0.71	0.00 *	1.52 ▲
Self-control	26	- 0.71	0.62	0.00 *	1.31 ▲
Assertiveness	26	- 0.69	0.64	0.00 *	1.24 ▲
Relaxation	26	- 0.90	0.79	0.00 *	1.56 ▲
Openness	26	- 0.85	0.65	0.00 *	1.55 ▲
Creativity	26	- 1.06	0.80	0.00 *	1.65 ▲
Results-orientation	27	- 0.73	0.97	0.00 *	1.05 ▲
Efficiency	26	- 0.86	0.66	0.00 *	1.56 ▲
Consultation	25	- 0.63	0.62	0.00 *	1.15 ▲
Negotiation	27	- 0.75	0.72	0.00 *	1.30 ▲
Conflict and Crisis	24	- 0.60	0.47	0.00 *	1.29 ▲
Reliability	26	- 0.75	0.82	0.00 *	1.27 ▲
Values Appreciation	25	- 0.75	0.61	0.00 *	1.44 ▲
Ethics	27	- 0.65	0.56	0.00 *	1.27 ▲
Communication	27	- 0.69	0.65	0.00 *	1.38 ▲

(a) *p*-value yielded by paired t-test for dependent groups in the case of probability sampling

* Statistically significant on a 0.05 level

▲ Practically significant ($d \geq 0.80$)

Post hoc paired t-tests and effect sizes for Observed – Expected construct pairs for **16 to 20 years** in projects:

Constructs	n	Mean Difference (Observed – Expected)	Std. Dev. Difference	*p*-values [(a)] (in case of probability sampling)	Cohen's *d* Effect Size
Leadership	19	- 0.80	0.78	0.00 *	1.30 ▲
Engagement and Motivation	20	- 0.93	0.79	0.00 *	1.47 ▲
Self-control	20	- 0.83	0.86	0.00 *	1.16 ▲
Assertiveness	20	- 0.91	0.70	0.00 *	1.37 ▲
Relaxation	20	- 0.83	0.98	0.00 *	1.21 ▲
Openness	20	- 0.81	0.74	0.00 *	1.37 ▲
Creativity	20	- 0.85	0.71	0.00 *	1.22 ▲
Results-orientation	21	- 0.83	0.70	0.00 *	1.46 ▲
Efficiency	20	- 0.97	0.73	0.00 *	1.53 ▲
Consultation	19	- 0.82	0.74	0.00 *	1.41 ▲
Negotiation	21	- 0.82	0.60	0.00 *	1.54 ▲
Conflict and Crisis	18	- 0.72	0.57	0.00 *	1.40 ▲
Reliability	20	- 0.70	0.88	0.00 *	0.97 ▲
Values Appreciation	18	- 0.69	0.61	0.00 *	1.14 ▲
Ethics	21	- 0.65	0.74	0.00 *	1.13 ▲
Communication	21	- 0.73	0.74	0.00 *	1.27 ▲

[(a)] *p*-value yielded by paired t-test for dependent groups in the case of probability sampling

* Statistically significant on a 0.05 level

▲ Practically significant ($d \geq 0.80$)

Post hoc paired t-tests and effect sizes for Observed – Expected construct pairs for **more than 20 years** in projects:

Constructs	n	Mean Difference (Observed – Expected)	Std. Dev. Difference	*p*-values [(a)] (in case of probability sampling)	Cohen's *d* Effect Size
Leadership	41	- 0.92	0.74	0.00 *	1.51 ▲
Engagement and Motivation	42	- 0.84	0.70	0.00 *	1.57 ▲
Self-control	42	- 0.91	0.74	0.00 *	1.61 ▲
Assertiveness	42	- 0.70	0.67	0.00 *	1.37 ▲
Relaxation	42	- 0.92	0.70	0.00 *	1.51 ▲
Openness	42	- 0.73	0.58	0.00 *	1.46 ▲
Creativity	42	- 0.99	0.72	0.00 *	1.51 ▲
Results-orientation	43	- 0.74	0.60	0.00 *	1.64 ▲
Efficiency	42	- 0.88	0.63	0.00 *	1.49 ▲
Consultation	41	- 0.74	0.68	0.00 *	1.39 ▲
Negotiation	43	- 0.76	0.61	0.00 *	1.41 ▲
Conflict and Crisis	40	- 0.68	0.63	0.00 *	1.15 ▲
Reliability	42	- 0.73	0.59	0.00 *	1.35 ▲
Values Appreciation	40	- 0.55	0.63	0.00 *	1.01 ▲
Ethics	43	- 0.68	0.77	0.00 *	1.11 ▲
Communication	43	- 0.70	0.66	0.00 *	1.30 ▲

[(a)] *p*-value yielded by paired t-test for dependent groups in the case of probability sampling

* Statistically significant on a 0.05 level

▲ Practically significant ($d \geq 0.80$)

MONETARY VALUE OF PROJECTS

Post hoc paired t-tests and effect sizes for Observed – Expected construct pairs for projects of **less than R1 million**:

Constructs	n	Mean Difference (Observed – Expected)	Std. Dev. Difference	*p*-values [(a)] (in case of probability sampling)	Cohen's *d* Effect Size
Leadership	8	- 0.31	0.51	0.13	0.40
Engagement and Motivation	9	- 0.67	0.77	0.03 *	1.14 ▲
Self-control	9	- 0.50	0.71	0.07	0.53
Assertiveness	9	- 0.53	0.48	0.01 *	0.92 ▲
Relaxation	9	- 0.56	0.68	0.04 *	0.94 ▲
Openness	9	- 0.36	0.40	0.03 *	0.50
Creativity	8	- 0.56	0.42	0.01 *	1.11 ▲
Results-orientation	10	- 0.33	0.42	0.03 *	0.64
Efficiency	9	- 0.86	0.99	0.03 *	1.24 ▲
Consultation	8	- 0.43	0.47	0.04 *	0.71
Negotiation	10	- 0.43	0.49	0.02 *	0.69
Conflict and Crisis	8	- 0.53	0.63	0.05 *	0.84 ▲
Reliability	8	- 0.41	0.65	0.12	0.72
Values Appreciation	8	- 0.25	0.50	0.20	0.45
Ethics	10	- 0.80	0.86	0.02 *	1.15 ▲
Communication	10	- 0.62	0.70	0.02 *	1.07 ▲

[(a)] *p*-value yielded by paired t-test for dependent groups in the case of probability sampling

* Statistically significant on a 0.05 level

▲ Practically significant ($d \geq 0.80$)

Post hoc paired t-tests and effect sizes for Observed – Expected construct pairs for projects of **R1 million to R9.99 million**:

Constructs	n	Mean Difference (Observed – Expected)	Std. Dev. Difference	*p*-values [(a)] (in case of probability sampling)	Cohen's *d* Effect Size
Leadership	9	- 0.72	0.98	0.06	1.04 ▲
Engagement and Motivation	10	- 0.63	0.60	0.01 *	1.11 ▲
Self-control	10	- 0.80	0.82	0.01 *	1.47 ▲
Assertiveness	10	- 0.53	0.59	0.02 *	0.87 ▲
Relaxation	10	- 0.55	0.60	0.02 *	0.75
Openness	10	- 0.45	0.54	0.03 *	0.79
Creativity	9	- 0.39	0.78	0.17	0.56
Results-orientation	10	- 0.53	0.61	0.02 *	1.06 ▲
Efficiency	10	- 0.68	0.66	0.01 *	1.25 ▲
Consultation	9	- 0.62	0.77	0.04 *	0.94 ▲
Negotiation	10	- 0.70	0.74	0.02 *	1.13 ▲
Conflict and Crisis	9	- 0.67	0.71	0.02 *	0.99 ▲
Reliability	9	- 0.47	0.55	0.03 *	0.85 ▲
Values Appreciation	9	- 0.59	0.62	0.02 *	1.25 ▲
Ethics	10	- 0.47	0.59	0.03 *	0.78
Communication	10	- 0.72	0.76	0.01 *	1.25 ▲

[(a)] *p*-value yielded by paired t-test for dependent groups in the case of probability sampling

* Statistically significant on a 0.05 level

▲ Practically significant ($d \geq 0.80$)

Post hoc paired t-tests and effect sizes for Observed – Expected construct pairs for projects of **R10 million to R99 million**:

Constructs	n	Mean Difference (Observed – Expected)	Std. Dev. Difference	*p*-values [(a)] (in case of probability sampling)	Cohen's *d* Effect Size
Leadership	20	- 0.84	0.71	0.00 *	1.28 ▲
Engagement and Motivation	22	- 0.88	0.76	0.00 *	1.50 ▲
Self-control	22	- 0.73	0.67	0.00 *	1.21 ▲
Assertiveness	22	- 0.67	0.58	0.00 *	1.19 ▲
Relaxation	22	- 0.91	0.97	0.00 *	1.25 ▲
Openness	22	- 0.77	0.61	0.00 *	1.37 ▲
Creativity	22	- 0.86	0.80	0.00 *	1.20 ▲
Results-orientation	23	- 0.77	0.76	0.00 *	1.29 ▲
Efficiency	22	- 0.74	0.60	0.00 *	1.23 ▲
Consultation	20	- 0.73	0.61	0.00 *	1.34 ▲
Negotiation	23	- 0.70	0.65	0.00 *	1.41 ▲
Conflict and Crisis	20	- 0.58	0.51	0.00 *	1.16 ▲
Reliability	22	- 0.53	0.52	0.00 *	1.04 ▲
Values Appreciation	20	- 0.55	0.56	0.00 *	0.97 ▲
Ethics	23	- 0.52	0.52	0.00 *	0.88 ▲
Communication	23	- 0.68	0.61	0.00 *	1.27 ▲

[(a)] *p*-value yielded by paired t-test for dependent groups in the case of probability sampling

* Statistically significant on a 0.05 level

▲ Practically significant ($d \geq 0.80$)

Post hoc paired t-tests and effect sizes for Observed – Expected construct pairs for projects of **R100 million to R1 billion**:

Constructs	n	Mean Difference (Observed – Expected)	Std. Dev. Difference	*p*-values [(a)] (in case of probability sampling)	Cohen's *d* Effect Size
Leadership	53	- 0.98	0.81	0.00 *	1.67 ▲
Engagement and Motivation	55	- 0.95	0.74	0.00 *	1.66 ▲
Self-control	54	- 0.75	0.71	0.00 *	1.25 ▲
Assertiveness	54	- 0.74	0.62	0.00 *	1.43 ▲
Relaxation	53	- 1.03	0.75	0.00 *	1.81 ▲
Openness	54	- 0.82	0.72	0.00 *	1.47 ▲
Creativity	53	- 1.07	0.78	0.00 *	1.70 ▲
Results-orientation	58	- 0.81	0.71	0.00 *	1.42 ▲
Efficiency	55	- 0.95	0.63	0.00 *	1.75 ▲
Consultation	53	- 0.76	0.67	0.00 *	1.33 ▲
Negotiation	58	- 0.81	0.65	0.00 *	1.41 ▲
Conflict and Crisis	51	- 0.72	0.63	0.00 *	1.31 ▲
Reliability	53	- 0.84	0.81	0.00 *	1.40 ▲
Values Appreciation	52	- 0.74	0.74	0.00 *	1.29 ▲
Ethics	58	- 0.76	0.73	0.00 *	1.35 ▲
Communication	58	- 0.82	0.74	0.00 *	1.39 ▲

(a) *p*-value yielded by paired t-test for dependent groups in the case of probability sampling

* Statistically significant on a 0.05 level

▲ Practically significant ($d \geq 0.80$)

Post hoc paired t-tests and effect sizes for Observed – Expected construct pairs for projects **over R1 billion**:

Constructs	n	Mean Difference (Observed – Expected)	Std. Dev. Difference	*p*-values [(a)] (in case of probability sampling)	Cohen's *d* Effect Size
Leadership	69	- 0.85	0.73	0.00 *	1.48 ▲
Engagement and Motivation	73	- 0.80	0.66	0.00 *	1.55 ▲
Self-control	73	- 0.83	0.70	0.00 *	1.37 ▲
Assertiveness	73	- 0.74	0.68	0.00 *	1.33 ▲
Relaxation	73	- 0.76	0.75	0.00 *	1.23 ▲
Openness	73	- 0.78	0.63	0.00 *	1.61 ▲
Creativity	72	- 0.93	0.75	0.00 *	1.45 ▲
Results-orientation	74	- 0.71	0.66	0.00 *	1.38 ▲
Efficiency	73	- 0.80	0.61	0.00 *	1.49 ▲
Consultation	69	- 0.76	0.66	0.00 *	1.52 ▲
Negotiation	74	- 0.73	0.61	0.00 *	1.41 ▲
Conflict and Crisis	68	- 0.67	0.59	0.00 *	1.29 ▲
Reliability	72	- 0.73	0.72	0.00 *	1.25 ▲
Values Appreciation	68	- 0.64	0.58	0.00 *	1.21 ▲
Ethics	74	- 0.60	0.63	0.00 *	1.09 ▲
Communication	74	- 0.70	0.64	0.00 *	1.41 ▲

[(a)] *p*-value yielded by paired t-test for dependent groups in the case of probability sampling

* Statistically significant on a 0.05 level

▲ Practically significant ($d \geq 0.80$)

ROLE

Post hoc paired t-tests and effect sizes for Observed – Expected construct pairs for **Programme Manager / Portfolio Manager** role:

Constructs	n	Mean Difference (Observed – Expected)	Std. Dev. Difference	*p*-values [(a)] (in case of probability sampling)	Cohen's *d* Effect Size
Leadership	9	- 0.64	0.80	0.04 *	1.04 ▲
Engagement and Motivation	10	- 0.42	0.44	0.01 *	0.82 ▲
Self-control	10	- 0.50	0.75	0.06	0.87 ▲
Assertiveness	10	- 0.52	0.59	0.02 *	1.05 ▲
Relaxation	10	- 0.35	0.88	0.24	0.64
Openness	10	- 0.65	0.53	0.00 *	1.46 ▲
Creativity	10	- 0.80	0.71	0.01 *	1.35 ▲
Results-orientation	10	- 0.87	0.97	0.02 *	1.53 ▲
Efficiency	10	- 0.51	0.46	0.01 *	1.15 ▲
Consultation	9	- 0.18	0.34	0.15	1.54 ▲
Negotiation	10	- 0.65	0.81	0.03 *	1.02 ▲
Conflict and Crisis	7	- 0.18	0.28	0.14	0.44
Reliability	10	- 0.28	0.61	0.19	0.50
Values Appreciation	8	- 0.17	0.47	0.35	0.37
Ethics	10	- 0.33	0.67	0.15	0.62
Communication	10	- 0.38	0.41	0.02 *	1.15 ▲

[(a)] *p*-value yielded by paired t-test for dependent groups in the case of probability sampling

* Statistically significant on a 0.05 level

▲ Practically significant ($d \geq 0.80$)

Post hoc paired t-tests and effect sizes for Observed – Expected construct pairs for **Functional Manager** role:

Constructs	n	Mean Difference (Observed – Expected)	Std. Dev. Difference	*p*-values [(a)] (in case of probability sampling)	Cohen's *d* Effect Size
Leadership	11	- 1.00	0.77	0.00 *	1.68 ▲
Engagement and Motivation	11	- 1.02	0.59	0.00 *	2.01 ▲
Self-control	11	- 0.91	0.49	0.00 *	1.61 ▲
Assertiveness	11	- 0.80	0.61	0.00 *	1.58 ▲
Relaxation	11	- 0.82	0.60	0.00 *	1.80 ▲
Openness	11	- 0.77	0.45	0.00 *	1.91 ▲
Creativity	11	- 1.00	0.55	0.00 *	1.44 ▲
Results-orientation	12	- 0.75	0.65	0.00 *	1.52 ▲
Efficiency	11	- 0.91	0.71	0.00 *	1.64 ▲
Consultation	11	- 0.95	0.52	0.00 *	2.08 ▲
Negotiation	12	- 0.90	0.49	0.00 *	1.90 ▲
Conflict and Crisis	11	- 0.80	0.65	0.00 *	1.56 ▲
Reliability	11	- 0.93	0.53	0.00 *	1.81 ▲
Values Appreciation	11	- 0.76	0.63	0.00 *	1.35 ▲
Ethics	12	- 0.86	0.59	0.00 *	1.79 ▲
Communication	12	- 0.85	0.59	0.00 *	1.95 ▲

(a) *p*-value yielded by paired t-test for dependent groups in the case of probability sampling

* Statistically significant on a 0.05 level

▲ Practically significant ($d \geq 0.80$)

Post hoc paired t-tests and effect sizes for Observed – Expected construct pairs for **Project Manager** role:

Constructs	n	Mean Difference (Observed – Expected)	Std. Dev. Difference	*p*-values [(a)] (in case of probability sampling)	Cohen's *d* Effect Size
Leadership	21	- 0.45	0.43	0.00 *	0.98 ▲
Engagement and Motivation	22	- 0.41	0.53	0.00 *	0.86 ▲
Self-control	22	- 0.68	0.65	0.00 *	1.21 ▲
Assertiveness	22	- 0.59	0.43	0.00 *	0.82 ▲
Relaxation	22	- 0.95	0.66	0.00 *	1.04 ▲
Openness	22	- 0.56	0.38	0.00 *	1.00 ▲
Creativity	21	- 0.77	0.43	0.00 *	1.19 ▲
Results-orientation	23	- 0.68	0.48	0.00 *	0.94 ▲
Efficiency	22	- 0.67	0.33	0.00 *	1.09 ▲
Consultation	21	- 0.56	0.46	0.00 *	0.86 ▲
Negotiation	23	- 0.71	0.50	0.00 *	0.97 ▲
Conflict and Crisis	21	- 0.46	0.26	0.00 *	0.80 ▲
Reliability	21	- 0.51	0.40	0.00 *	0.70
Values Appreciation	21	- 0.73	0.45	0.00 *	1.08 ▲
Ethics	23	- 0.60	0.65	0.02 *	0.51
Communication	23	- 0.54	0.44	0.00 *	0.80 ▲

[(a)] *p*-value yielded by paired t-test for dependent groups in the case of probability sampling

* Statistically significant on a 0.05 level

▲ Practically significant ($d \geq 0.80$)

Post hoc paired t-tests and effect sizes for Observed – Expected construct pairs for **Engineering Manager** role:

Constructs	n	Mean Difference (Observed – Expected)	Std. Dev. Difference	*p*-values [(a)] (in case of probability sampling)	Cohen's *d* Effect Size
Leadership	16	- 1.08	0.83	0.00 *	1.69 ▲
Engagement and Motivation	16	- 1.00	0.72	0.00 *	2.03 ▲
Self-control	16	- 0.72	0.84	0.00 *	1.05 ▲
Assertiveness	16	- 0.70	0.64	0.00 *	1.22 ▲
Relaxation	16	- 1.09	0.71	0.00 *	2.08 ▲
Openness	16	- 0.91	0.68	0.00 *	1.78 ▲
Creativity	16	- 1.09	0.71	0.00 *	1.77 ▲
Results-orientation	17	- 0.49	0.83	0.03 *	0.77 ▲
Efficiency	16	- 0.81	0.59	0.00 *	1.40 ▲
Consultation	16	- 0.85	0.65	0.00 *	1.43 ▲
Negotiation	17	- 0.62	0.49	0.00 *	1.22 ▲
Conflict and Crisis	16	- 0.69	0.53	0.00 *	1.39 ▲
Reliability	16	- 0.83	0.75	0.00 *	1.45 ▲
Values Appreciation	16	- 0.77	0.61	0.00 *	1.38 ▲
Ethics	17	- 0.67	0.55	0.00 *	1.22 ▲
Communication	17	- 0.69	0.58	0.00 *	1.44 ▲

(a) *p*-value yielded by paired t-test for dependent groups in the case of probability sampling

* Statistically significant on a 0.05 level

▲ Practically significant ($d \geq 0.80$)

Post hoc paired t-tests and effect sizes for Observed – Expected construct pairs for **Project Team Member** role:

Constructs	n	Mean Difference (Observed – Expected)	Std. Dev. Difference	*p*-values [(a)] (in case of probability sampling)	Cohen's *d* Effect Size
Leadership	79	- 0.95	0.78	0.00 *	1.59 ▲
Engagement and Motivation	86	- 0.96	0.72	0.00 *	1.77 ▲
Self-control	85	- 0.87	071	0.00 *	1.49 ▲
Assertiveness	85	- 0.79	0.66	0.00 *	1.52 ▲
Relaxation	84	- 0.96	0.82	0.00 *	1.45 ▲
Openness	85	- 0.85	0.71	0.00 *	1.61 ▲
Creativity	83	- 0.96	0.83	0.00 *	1.44 ▲
Results-orientation	89	- 0.83	0.65	0.00 *	1.61 ▲
Efficiency	86	- 0.92	0.63	0.00 *	1.78 ▲
Consultation	79	- 0.85	0.65	0.00 *	1.59 ▲
Negotiation	89	- 0.82	0.67	0.00 *	1.51 ▲
Conflict and Crisis	78	- 0.78	063	0.00 *	1.50 ▲
Reliability	83	- 0.83	0.77	0.00 *	1.50 ▲
Values Appreciation	78	- 0.65	0.65	0.00 *	1.21 ▲
Ethics	89	- 0.75	0.66	0.00 *	1.34 ▲
Communication	89	- 0.86	0.73	0.00 *	1.55 ▲

[(a)] *p*-value yielded by paired t-test for dependent groups in the case of probability sampling

* Statistically significant on a 0.05 level

▲ Practically significant ($d \geq 0.80$)

Post hoc paired t-tests and effect sizes for Observed – Expected construct pairs for **Member of PMO** role:

Constructs	**n**	**Mean Difference (Observed – Expected)**	**Std. Dev. Difference**	***p*-values [(a)] (in case of probability sampling)**	**Cohen's *d* Effect Size**
Leadership	23	- 0.76	0.80	0.00 *	1.19 ▲
Engagement and Motivation	24	- 0.77	0.72	0.00 *	1.34 ▲
Self-control	24	- 0.58	0.65	0.00 *	0.76 ▲
Assertiveness	24	- 0.73	0.68	0.00 *	1.15 ▲
Relaxation	24	- 0.65	0.68	0.00 *	1.10 ▲
Openness	24	- 0.66	0.65	0.00 *	0.97 ▲
Creativity	23	- 0.96	0.86	0.00 *	1.34 ▲
Results-orientation	24	- 0.63	0.66	0.00 *	1.06 ▲
Efficiency	24	- 0.95	0.86	0.00 *	1.42 ▲
Consultation	23	- 0.70	0.74	0.00 *	1.04 ▲
Negotiation	24	- 0.66	0.61	0.00 *	1.23 ▲
Conflict and Crisis	23	- 0.62	0.68	0.00 *	1.00 ▲
Reliability	23	- 0.62	0.73	0.00 *	0.93 ▲
Values Appreciation	23	- 0.73	0.78	0.00 *	1.15 ▲
Ethics	24	- 0.60	0.72	0.00 *	1.01 ▲
Communication	24	- 0.73	0.70	0.00 *	1.26 ▲

(a) *p*-value yielded by paired t-test for dependent groups in the case of probability sampling

* Statistically significant on a 0.05 level

▲ Practically significant ($d \geq 0.80$)

Post hoc paired t-tests and effect sizes for Observed – Expected construct pairs for **All Roles** (except Project Manager):

Constructs	**n**	**Mean Difference (Observed – Expected)**	**Std. Dev. Difference**	***p*-values [(a)] (in case of probability sampling)**	**Cohen's *d* Effect Size**
Leadership	138	- 0.92	0.79	0.00 *	1.50 ▲
Engagement and Motivation	147	- 0.90	0.71	0.00 *	1.68 ▲
Self-control	146	- 0.78	0.71	0.00 *	1.26 ▲
Assertiveness	146	- 0.75	0.65	0.00 *	1.39 ▲
Relaxation	145	- 0.87	0.79	0.00 *	1.40 ▲
Openness	146	- 0.80	0.67	0.00 *	1.49 ▲
Creativity	143	- 0.97	0.79	0.00 *	1.46 ▲
Results-orientation	152	- 0.76	0.70	0.00 *	1.40 ▲
Efficiency	147	- 0.88	0.66	0.00 *	1.61 ▲
Consultation	138	- 0.79	0.66	0.00 *	1.43 ▲
Negotiation	152	- 0.77	0.64	0.00 *	1.38 ▲
Conflict and Crisis	135	- 0.71	0.62	0.00 *	1.33 ▲
Reliability	143	- 0.77	0.74	0.00 *	1.33 ▲
Values Appreciation	136	- 0.66	0.66	0.00 *	1.18 ▲
Ethics	152	- 0.70	0.66	0.00 *	1.26 ▲
Communication	152	- 0.79	0.69	0.00 *	1.48 ▲

[(a)] *p*-value yielded by paired t-test for dependent groups in the case of probability sampling

* Statistically significant on a 0.05 level

▲ Practically significant ($d \geq 0.80$)

APPENDIX F – INTERVIEW RESPONSES

Answers to the interview questions are colour-coded for each of the respective respondents.

1. **What do you see as the top challenges for project management in the next 10 years?**

Project managers will be challenged with managing construction contractors during the project execution phase. More and more, construction contractors have a very narrow skills base which requires careful planning and management by the project manager. The project manager must be able to identify these risks, manage them, and allow for them in the project budget. Project managers will be required to plan and manage large mega projects in an increasingly complex environment. Softer skills will become more important for a project manager. Project activities will be conducted on a more virtual basis. Thus being able to motivate people will be critical for success. Another important aspect will be the ability to deal with and prioritise the enormous amount of information available. The current global skills shortage will remain a major challenge in the next decade.

People management will be the biggest challenge. The profile and experience of project managers will be important to success. This is influenced by the make-up of the project team members and the chosen contracting strategy. Resources will continue to be scarce and highly mobile. The trend of bigger and bigger projects will continue. This is exacerbated by companies merging and the quest to achieve economies of scale. The technology landscape will cause risk profiles to worsen – new technology will be used in facilities to increase throughput.

How to get work done with less competent younger engineers. Another major challenge is to get projects built. Craftsmen are currently short in supply and will continue to be in the future. Projects are getting bigger and bigger. People now have coined the term giga-projects. Complexity is increasing rapidly making projects almost impossible to understand. Projects that are big and complex are difficult for project managers to conceptualise and control. Successful project managers will be able to break a large project into smaller manageable parts. Being able to distil requirements from the business stakeholders will be a key skill for future project managers even more so than now.

I see two main challenges for the future of project management: increasing complexity and relationships (with people). The complexity of projects is increasing in many aspects such as contracts, partnerships, government requirements and legislation, execution in different countries with diversity of cultures, virtual offices and so on. Relationships with people are critical for projects as it is people who take decisions. Relationships with all stakeholders are important and not only within the project team. Unfortunately taking a systems approach tends to eliminate people – project manages will need to focus on the

human interaction for projects to be successful. People skills will be fundamental to success for project managers. An important skill will be communication.

The main challenge will be cost effective project execution. The last five years have focussed on speed. How to achieve cost effectiveness will be the test. Good front end loading will be critical which requires team development (as per the IPA definition). Rework must be minimised. We need to clarify needs rather than try and interpret by ourselves.

The main challenge will be qualified experienced resources and the attitude of the work force to be productive and get projects completed.

2. Which of these are unique to South Africa?

South African production factors will continue to frustrate those involved with project execution. Strikes are a major problem and put projects at risk. South Africa suffers generally from a number of cultural issues namely: people's attitudes to safety, a low work ethic, lawlessness and asking "What's in it for me?". These need urgent attention. There is a major skills shortage especially with craft labour. These are issues which need to be solved within the country.

South Africa has a shortage of skills as well as low levels of certain skills. The number of experienced resources is lacking. South African resources will continue to capitalise on opportunities to work in the global arena especially on expatriate assignments where tax incentives are available.

South Africa has its own challenges brought about from lack of craftsman. The impact of retiring boomers will affect projects as a whole – from project managers through to construction workers. Project managers in South Africa tend to take on responsibility earlier in their careers. Experience of project managers is currently a concern which is likely to continue in the coming years. Experience brings insight which is essential for project execution. Project managers will need to address the overall lack of discipline when executing projects. Decision making on project related matters is currently slow and will need attention in future especially considering the aggressive schedules which have become the norm.

The above are generic to projects executed anywhere. In South Africa we will be challenged by the same issues. Black Economic Empowerment (BEE) and in particular government requirements (e.g. relating to labour) could continue to challenge project managers.

In South Africa there is a lack of competition amongst the local engineering contractors. This limits owners in terms of choice and also in contracting strategies for project execution. Cost effectiveness is often not achieved due to the lack of competition amongst the larger players in South Africa.

Attitude of the work force in South Africa – industrial action, productivity, etc. The brain drain from South Africa to other countries will continue to be problematic with the loss of experienced project resources.

3. **Which of the following project management behavioural competences will be most important for a project manager to be successful ten years from now? Rank your top five by means of numbers.**

	Role	R1	R2	R3	R4	R5	R6
1	Leadership	1	1	1	1	3	1
2	Engagement and Motivation		5	2			5
3	Self-control	4					
4	Assertiveness	2		5			2
5	Relaxation						
6	Openness						
7	Creativity						
8	Results-orientation			3	5	5	
9	Efficiency						4
10	Consultation		2	4	3	4	
11	Negotiation						
12	Conflict and Crisis	3					
13	Reliability					2	3
14	Values Appreciation		3		2	1	
15	Ethics	5					
16	Communication		4		4		

R1 to R6 denotes respondents.

4. **How should project managers prepare themselves to be competent in the identified top behavioural competences?**

Project managers should seek out coaches and mentors that can guide them and provide input into development of the appropriate competencies. They need to continuously build on their knowledge base and apply to the real life situation. Their aim should be to acquire an understanding and appreciation of the subject matter and to gain task relevant competence. Project managers should be careful of learning shortcuts which are often used by more experienced practitioners. Often these deviate from best practice and become reinforced over time which creates problems for both the project managers and for the organisation.

What is important is for project managers to be trained in general management. Project management is about getting things done and general management will leverage this. People need to be taught the basics. These must be entrenched over time by doing and building experience, i.e. systematic exposure. Experienced resources must be prepared to teach and coach others. It will be important to match project managers to projects according to their ability and skills set – do not set them up for failure. Give continual support and review the work done by project managers giving constructive feedback as appropriate.

Project managers must develop the ability to frame large complex projects. They should be able to distance themselves from the detail when doing the framing. Project managers need to build experience and insight over time by working on progressively bigger and more complex projects. They should accept that there is no quick fix to building competence. Businesses should take more ownership in developing project management competence in the organisation.

Project managers should know the gaps in their competency and consciously work towards closing these gaps by continuous learning. They should find out where they can obtain the appropriate training. Finding a mentor and a coach is paramount. Establishing and getting involved in a “network” of knowledgeable people is important to stimulate the exchange of ideas. Importantly, project managers should embark on the journey to achieving maturity in project management skills. This implies having the wisdom to observe, listen and decide on an appropriate course of action.

Project managers should seek out coaches and mentors that can guide them and provide input into development of the appropriate competencies. They need to continuously build on their knowledge base and apply to the real life situation. Their aim should be to acquire an understanding and appreciation of the subject matter and to gain task relevant competence. Project managers should be careful of learning shortcuts which are often used by more experienced practitioners. Often these deviate from best practice and become reinforced over time which creates problems for both the project managers and for the organisation.

After performing a gap analysis for their skills and competences, project managers have many formal project management specific training interventions at their disposal. Employers should however look to recruit for the right makeup of individuals as training can take some time.

5. **What is your opinion of formal job profiles for project managers in your organisation? Do they adequately address the soft skills required by project managers?**

My organisation has a well-defined set of job profiles for the respective levels of project managers.

Very good structured job profile with clearly defined career paths. They are open and give options to project managers. Soft skills are not adequately addressed. Assessment of skills is an issue.

Cannot comment.

Although sufficient, they lack detail in some areas relating to the actual expectations of project managers. They can be better expressed regarding the scope of the project manager. They received a strong input from Human Resources and as such do not lack soft skill requirements. Perhaps a criticism is that there are too many of these. The organisation is good at building new thinking into the job profiles. Currently the third revision is in progress.

My organisation has a relatively good set of job profiles for the project manager from the lowest to the highest levels. A criticism is that while academic credentials are well addressed the job profiles do not support those with limited formal academic training and a wealth of job specific experience. Although job profiles may state requirements, evaluation and assessment of individuals according those requirements is difficult.

No knowledge of the formal project management job profiles in the organisation.

6. **List the formal competency frameworks you are aware of? (e.g. PMI, IPMA, etc.) What are the strengths of these frameworks? What are the weaknesses of these frameworks?**

IPMA, PMI. They are generic but can be utilised as a starting point. Soft skills are really those required for general management for which there is much reference material – does not really need to be comprehensively addressed in the competency frameworks.

PMI's PMBOK is a good basic tool. Maturity levels are not addressed.

Cannot comment except for the fact that assessment of competence is difficult to achieve.

I have a fair knowledge of the PMI and the Australian project management competency frameworks. The Australian framework contains a good list of competencies. The others tend to lack guidance on the assessment of competencies. A good framework should address the nuances of project management such as problem solving and decision making.

PMI, Australian, British, South Africa – construction industry. The competency frameworks contained in the respective project management bodies of knowledge are very generic. Project management organisations need to adapt them to be more specific to the industry in which they operation.

None.