AN EVALUATION OF SOCIAL TEAM BUILDING INTERVENTIONS ON MBA GROUP FORMATION

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AN EVALUATION OF SOCIAL TEAM BUILDING INTERVENTIONS ON MBA GROUP FORMATION

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I. DECLARATION

I, the undersigned, hereby declare that:

• The work contained in this treatise is my own original work;

• This treatise was not submitted in full or partial fulfilment to any other recognised university for any other degree;

• This treatise is being submitted in partial fulfilment of the requirements for the degree of Masters in Business Administration; and

• All sources used or referred to have been documented and recognised.

Johan Westraadt

10 March 2019

Date

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III. ABSTRACT

Teamwork and the ability to work effectively in a team is a critical skill in a technologically complex workplace where no individual can possess all the knowledge and skills. MBA programmes, therefore, require students to work in collaborative learning groups in order to not only share their knowledge and skills, but also to develop the needed team-based competencies. However, collaborative learning groups are prone to many pitfalls that could result in intra-group conflict and inefficiencies such as social loafing, where the group performance is less than the sum of the output of the individual members when working alone.

Team development interventions (TDI) aim to improve team-based competencies of a team. One type of TDI that is often employed is *social team building.* It typically consists of a one-day extra-mural excursion involving some non-work related tasks performed by teams to improve interpersonal relationships. The MBA groups are pre-allocated at the start of the academic programme and team building interventions are therefore needed to facilitate group formation. The main research question in this study deals with the effectiveness of these social team building TDI's to promote group formation.

The literature of teams and the factors that influence team effectivity were reviewed. Input-Process-Output models relate the factors that drive team performance. Three team viability measures critical to a teams' performance were identified namely, group cohesion, group communication and goal-setting. There is strong empirical evidence that these factors contribute positively to the performance of the team. The influence of team building interventions on each of these factors were discussed. There is empirical evidence for the impact of team building interventions on these affective outcomes. However, empirical evidence for the link to objective performance measures is still lacking.

The students participated in a social team building intervention during February 2018 as part of the orientation at the start of the study programme. The team building intervention used the popular TV series 'Amazing Race' as a theme. The event used the Boardwalk Casino complex in Summerstrand, Port Elizabeth as a venue. The primary data were collected from 168 students from the 2018 intake of the post-graduate business administration programme at the Nelson Mandela University Business School using a paper-based questionnaire. The questionnaire was adapted from a previous study on the effect of social team building on

group cohesion. The questionnaire measures self-reported perceptions of the participants regarding the event, group formation and the team viability measures experienced during the event. The questionnaire was completed in class after the social team building event.

The perceptions of the participants regarding the Amazing Race event and the group formation were overwhelmingly positive, where more than 97% (n > 162) agreed that it was a positive experience. In addition, there were statistically significant positive relationships between the Amazing Race event and the team viability measures (Group cohesion, Group communication, Goal setting). Also, there were statistically significant positive relationships between the team viability measures and Team Building experienced during the event. Therefore, the social team building intervention was *perceived* to be a success by the participants.

A proposed conceptual model was compiled and tested using exploratory factor analysis, confirmatory factor analysis and structural equation modelling. The exploratory factor analysis and confirmatory factor analysis confirmed the validity and reliability of the measurement items. The results of the study indicate the factors group cohesion, group communication, goal setting and team building loaded with a statistically significant relationship onto the Amazing Race event as the independent variable, although the proposed model did not satisfy all the necessary fitting indices for an acceptable model.

Recommendations for the design of systematic development future team building interventions include a) the use of more experimental design elements such as randomised control groups and pre-tests in order to test causal relationships, b) the use of measurement items operationalised from existing literature, c) inclusion of more open-ended qualitative questions after the intervention and d) further team development interventions such as team training interventions to address skill deficiencies within the team as a supplement to the team building interventions.

Key Words: Team building, Teamwork, Collaborative learning, MBA.

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1. CHAPTER 1: INTRODUCTION AND PROBLEM STATEMENT

1.1 INTRODUCTION

In an ever rapidly changing complex technological environment, it is impossible for individuals to contain all the knowledge, thus working in *teams* and *teamwork* is a reality in most businesses. A recent survey by Deloitte (McDowell, Agarwal, Miller, Okamoto & Page, 2016) showed that teamwork is one of the major global trends. Deloitte mention that a new organisational model is emerging that consists of a "*network of teams*", where each team has a high degree of empowerment, strong communication and rapid information flow.

The rise of teamwork spans many industries including healthcare (Weller, Boyd & Cumin, 2014), engineering and manufacturing (Oladiran, Uziak, Eisenberg & Scheffer, 2011), technology and science (Coll & Zegwaard, 2006) and sports (Gaffney, 2015). Increasingly teams are forced to work remotely and are geographically spaced out into virtual teams (Hertel, Geister & Konradt, 2005). It is for this reason that the South African Qualification Authority (SAQA) includes *"Work effectively with others as a member of a team or group in the management of an organisation"* as a critical cross-field outcome for an accredited Masters in Business Administration (MBA) programme (CHE - Council on Higher Education, 2018, p. 1).

Effective teamwork does not happen by itself and according to a recent survey by PayScale, 36% of new graduates are deficient in critical teamwork competencies (Dishman, 2016). One way to improve teamwork competencies is through *team development interventions* (TDI). A TDI is defined as a "*systematic activity aimed at improving requisite team competencies, processes and overall effectiveness*" (Lacerenza, Marlow, Tannenbaum & Salas, 2018, p. 518). One type of TDI that is often employed is *social team building.* It typically consists of a one-day extra-mural excursion involving some non-work related tasks performed by teams to improve interpersonal relationships. The main research question in this study deals with the effectiveness of these social team building TDIs.

Numerous reviews/meta-studies (Beauchamp, McEwan & Waldhauser, 2017; Klein et al., 2009; Salas et al., 2008; Salas, Rozell, Mullen & Driskell, 1999; Tannabaum, Beard & Salas, 1992) found no meaningful statistical relationship between teambuilding and objective

performance measures. Furthermore, several studies of the effectiveness of team building interventions used evaluation methods with methodological deficiencies (Tannabaum, Beard & Salas, 1992). It is therefore essential to use evidence-based methods for the design and evaluation of TDIs.

Collaborative learning groups are established in MBA programmes to build team-working skills. These teams are usually formed at the start of the programme and requires that these teams work together on projects, exercises and assignments throughout the 1-3 years of study. However, it has been observed that not all students agreed that group work enhanced their study experience (Amanjee & Carmichael, 2015). TDI's can be used to facilitate group work on the MBA programme.

To evaluate the effect that social team building interventions have on the formation of MBA study groups, there is a need to be clear on the definitions of a *team*, *teamwork*, *team effectivity* and *performance* and how these relate to the unique and somewhat artificial environment of an MBA study group. There are a number of different models (Tannabaum, Beard & Salas, 1992) that relate team effectiveness and the factors that influence team performance. Furthermore, teams are dynamic entities, which change over time (Tuckman & Jensen, 1977; Bonebright, 2010). Thus, it is of vital importance to understand how teams evolve. The literature pertaining to the abovementioned topics are investigated.

This study will evaluate a social team building intervention applied during the student orientation week of the 2018 intake of post-graduate students to the Business Administration programme at the Nelson Mandela University's Business School. The goal of this study is to make recommendations towards the systematic design and evaluation of social team building interventions for MBA study groups.

Figure 1.1 illustrates the Chapter One outline.

Chapter 1: Introduction and Problem Statement

- 1.1 Introduction
- 1.2 MBA Study Groups
- 1.3 Problem Statement
- 1.4 Research Objectives
- 1.5 Research Questions
- 1.6 Research Delimitation
- 1.7 Research Significance
- 1.8 Research Methodology
- 1.9 Ethical Clearance
- 1.10 Report Structure
- 1.11 Summary

Chapter 2: Literature Review

Chapter 3: Research Design and Methodology

Chapter 4: Results and Analysis

Chapter 5: Findings, Conclusions and Recommendations

FIGURE 1-1. CHAPTER ONE OUTLINE

1.2 MBA STUDY GROUPS

The MBA programme at the Nelson Mandela University Business School presents a unique opportunity to work as a member of a diverse study group consisting of three to six members with a mix of different skills. The study groups are pre-allocated by academic placement faculty through consideration of the individual professions and skills levels. The Business School aims to have a combination of individuals within a study group with all the necessary skills to succeed on the MBA programme. The study groups remain intact for all the academic modules during the 2-year programme.

Student assessment on the MBA-programme consists of continuous assessment (50%) and an individual exam (50%). The continuous assessment includes a group work component (40%) and an individual assignment (60%). There are slight variations in the mark allocation for different modules, but this is generally the breakdown. The group work tasks typically

involve written research assignments and group presentations in class. The intention is for the study groups to work collaboratively to solve problems and discuss the assignments during weekly face-to-face study group meetings.

1.3   PROBLEM STATEMENT

There are some challenges for newly formed MBA study groups. Firstly, the groups are pre-assigned and have never met before. The group members are often heterogeneous regarding their backgrounds, race, gender, power-distance, culture, academic readiness and each member might have different motivations for studying towards the degree. Also, the study groups operate as self-managed work teams without a formally assigned leader hierarchy. All of these conditions are well known predictors for both task-related and team-related conflict in MBA study groups (Amanjee & Carmichael, 2015; Gantasala, 2015; Rafferty, 2013a; Rafferty, 2013b; Kelly, 2009; Desplaces, Congden & Boothe, 2007; Chapman, Meuter, Toy & Wright, 2006; Chen, Donahue & Klimoski, 2004; Bacon, Stewart & Silver, 1999; Peiperl & Rose, 1997). Orientation programmes to assist MBA study groups in the formation stage are thus of critical importance to fast-track the development of the MBA study groups towards effective teams.

Social team building can be used as a TDI during student orientation to facilitate the formation of new study groups. Historically, social team building has mostly been applied to existing groups. Research is therefore needed to study its effect on team formation. Also, social team building has often been implemented in a non-systematic way and it is not always clear how it contributes towards the increased performance of a team (Klein et al., 2009).

Since group work on an MBA programme is a critical outcome, the Nelson Mandela University Business School has interventions to enhance MBA study group formation at the start of the programme. Knowledge about the effectiveness of these interventions is important for the evidence-based development of additional interventions.

As such, the research problem has been formulated as follows:

Research Problem: *The Business School needs to determine if the group forming interventions have an impact on MBA study group formation and team functioning.*

1.4 RESEARCH QUESTIONS

The Main Research Question (RQ_M) was formulated based on the Research Problem discussed in Section 1.2 and is stated as follows:

RQ_M: *How effective are social team building interventions on MBA study group formation?*

The supporting research questions (RQ) that will aid in answering the RQ_M include:

> *RQ_1: Why is group work important on an MBA programme?*
>
> *RQ_2: What are the stages in group development?*
>
> *RQ_3: What makes an effective MBA study group?*
>
> *RQ_4: What are the possible benefits of social team building events on MBA study groups?*
>
> *RQ_5: What research design can be used in this study?*
>
> *RQ_6: What recommendations can be made for the systematic design of social team building interventions for an MBA programme?*

1.5 RESEARCH OBJECTIVES

To address the above-stated research questions, the main Research Objective (RO_M) will be:

RO_M: *To evaluate the effectiveness of social team building interventions on MBA group formation.*

The following secondary objectives will aid in answering the main research objective:

> *RO_1: To discuss the importance of MBA study group work.*
>
> *RO_2: To identify the stages of group development to understand the dynamics during group formation.*
>
> *RO_3: To discuss the factors that make an effective MBA study group.*
>
> *RO_4: To understand how social team building can be used to promote MBA study group formation.*
>
> *RO_5: To establish the appropriate research design and methodology which will be used so that the study can be replicated in future.*
>
> *RO_6: To formulate guidelines for the systematic design of social team building interventions for MBA study groups.*

The research alignment plan is illustrated in Table 1.1:

TABLE 1-1. RESEARCH ALIGNMENT PLAN

Title: An Evaluation of Social Team Building Interventions on MBA Group Formation		
Problem statement: Group work on an MBA programme is a critical outcome. The Nelson Mandela University Business School has interventions to enhance MBA study group formation. The Business School needs to determine if these group forming interventions have an impact on MBA study group formation and team functioning. This knowledge can be used to develop additional evidence-based team development interventions.		
Main Research Question (RQ$_M$): How effective are social team building interventions on MBA study group formation?		
Main Research Objective (RO$_M$): To evaluate the effectiveness of social team building interventions on MBA study group formation		
Chapter	**Research Questions**	**Research Objectives**
Chapter 2 Literature Review	RQ_1: Why is group work important on an MBA programme?	RO_1: To discuss the importance of MBA group work.
	RQ_2: What are the stages in group development?	RO_2: To identify the stages of group development in an effort to understand the dynamics during group formation.
	RQ_3: What makes an effective MBA study group?	RO_3: To discuss the factors that makes an effective MBA study group.
	RQ_4: What are the possible benefits of social team building events on MBA study groups?	RO_4: To understand how social team building can be used to promote MBA study group formation.
Chapter 3 Research Design and Methodology	RQ_5: What research design can be used in this study?	RO_5: To establish the appropriate research design and methodology which will be used so that the study can be replicated in future.
Chapter 4 Empirical Study	RQ_M: How effective are social team building interventions on MBA study group formation?	RO_M: To evaluate the effectiveness of social team building interventions on MBA study group formation.
Chapter 5 Findings, conclusion and recommendations	$RQ6$: What recommendations can be made for the systematic design of social team building interventions for an MBA programme?	$RO6$: To formulate guidelines for the systematic design of social team building interventions for new MBA study groups.

1.6   RESEARCH DELIMITATION

This study will only focus on social team building interventions performed during student orientation at the start of the MBA programme and thus it will focus on the effect of the team development intervention on the *formation* of MBA study groups.

Data were collected from the post-graduate student intake of 2018 of the Nelson Mandela University Business School. The data consists of a quantitative post-intervention questionnaire that measures the social team building event as the independent variable and some self-reported perceptions from the respondents about their group functioning during the social team building event. This study had no control-group, nor was any pre-intervention information collected from the participants in this study.

1.7   RESEARCH SIGNIFICANCE

This study explores teamwork on an MBA programme and the development and implementation of evidence-based team development interventions that could improve team effectivity. Team building interventions have formed part of business practice for the past 50 years, however the impact the interventions have on objective performance measures remains unclear. This study will attempt to review the literature of *teams*, *teamwork*, *team effectiveness* and *teambuilding* to build a conceptual model for the effect of social team building interventions has on team performance. A model will then be proposed and evaluated with data collected from a social team building intervention event, which formed part of the student orientation at the start of the MBA programme. Recommendations will be made regarding the design of evidence-based social team building interventions that could not only facilitate MBA study group formation but also be applied to MBA study groups to increase effectivity at the various stages of the group development.

1.8   RESEARCH METHODOLOGY

The research methodology will address the research approach, literature study and collection process of the data.

1.8.1 RESEARCH APPROACH

A literature review and case study form part of this research that is a quantitative study. A specific characteristic of a phenomenon is the focus area of quantitative research. To

generalise the findings to the greater population, numeric data are gathered from a sample group and analysed.

1.8.2 LITERATURE STUDY

A literature review identifies new perspectives, ideas and approaches that are not apparent to the researcher beforehand (Kumar, 2011; Leedy & Ormrod, 2010). Before the researcher can critically review the available literature, insight is required to identify gaps and deficiencies in knowledge (Collis & Hussey, 2014). The validity of the research is dependent on the reviews of existing literature and research methodologies.

1.8.3 DATA COLLECTION

Data were collected after the social team building intervention (Amazing Race event) using a paper-based questionnaire (Annexure B: Questionnaire) from 168 students of the 2018 intake into the post-graduate business administration programme at the Nelson Mandela University Business School. The data were collected using non-probability sampling without a control group since all the students were expected to have participated in the social team building event.

1.8.4 DATA ANALYSIS

Accepting or rejecting the hypotheses proposed using statistical analysis of gathered numeric data is the purpose of this study (Collis & Hussey, 2014). By using statistical analysis, it can be accepted that this is a quantitative empirical study. The quantitative data were sorted, categorised and cleaned to facilitate the investigation. The analyses performed on the data included descriptive statistics such as measures of central tendencies, including the mean, median and the mode and inferential statistics, specifically using t-tests and Cohen's d analysis. The data were then analysed for exploratory factor analysis, confirmatory factor analysis and structural equation modelling to find the relationships between the different independent, intermediate and dependent variables of the proposed model.

1.9 ETHICAL CLEARANCE

The Nelson Mandela University has a list of criteria that stipulate which studies require full ethical clearance. Since this treatise involve the study of students registered at the Nelson

Mandela University Business School full ethical clearance was needed. The Ethical Clearance (Human) approval letter (**H18-BES-BUS-025**) from the H-REC committee of Nelson Mandela University is attached as Annexure A: Full Ethical Clearance.

1.10 REPORT STRUCTURE

The chapters in the treatise will cover the following:

Chapter 1: Introduction and Problem Statement

In this chapter, an introduction to the study is given. Additionally, the Research Problem, Research Questions and Research Objectives are stated. An overview of the study, its purpose, delimitation and significance are specified. The research alignment plan is outlining the structure of the document is illustrated in Table 1.1.

Chapter 2: Literature Review

This chapter explores numerous academic resources to address the first four research questions and therefore their corresponding research objectives. Namely, *RQ$_1$: Why is group work important on an MBA programme?* To correspond with *RO$_1$: To discuss the importance of MBA group work.* Additionally, *RQ$_2$: What are the stages in group development?* To correspond with *RO$_2$: To identify the stages of group development to understand the dynamics during group formation.* Furthermore *RQ$_3$: What makes an effective MBA study group?* Will address *RO$_3$: To discuss the factors that make an effective MBA study group.* Finally, *RQ$_4$: What are the benefits of social team building events on MBA study groups?* Will address *RO$_4$: To understand how social team building events can be used to promote MBA study group formation.* This chapter will conclude with a conceptual model to show the effect that a specific social team building event has on a group's cohesion, goal setting, communication and team building (*group formation*) that took place during the intervention.

Chapter 3: Research Design and Methodology

Chapter Three explores the various research philosophies and approaches and outlines the research design and methodology that this study will follow. The unit of analysis and participants of this study are elaborated on and the data analysis methods are discussed. Therefore, Chapter Three addresses *RQ$_5$: What research design can be used in this study?*

Which corresponds to *RO$_5$: To establish the appropriate research design and methodology which will be used so that the study can be replicated in future.*

Chapter 4: Results and Analysis

In this chapter, the results of the empirical study are presented, discussed and analysed. Both descriptive and inferential statistics, as well as factor analysis and structural equation modelling, are conducted. Various tables and charts are used to present the data and findings. Therefore, Chapter Four addresses the main research question: ***RQ$_M$**: How effective is social team building interventions on MBA study group formation?* Which links to the main research objective: ***RO$_M$**: To evaluate the effectiveness of social team building interventions on MBA study group formation.* This chapter forms the foundation for Chapter Five.

Chapter 5: Findings, Conclusions and Recommendations

Chapter Five presents the findings of the study based on the results shown in Chapter Four and makes managerial recommendations based on the findings. The limitations of this study are outlined and any call for future research are identified. Finally, this chapter makes conclusions based on the research problem defined in this chapter. Thus, Chapter Five addresses *RQ$_6$: What recommendations can be made for the design of systematic team building interventions for MBA study groups?* Which matches *RO$_6$: To formulate guidelines for the systematic design of social team building interventions for MBA study groups.*

Figure 1.2 outlines the structure and layout of this treatise.
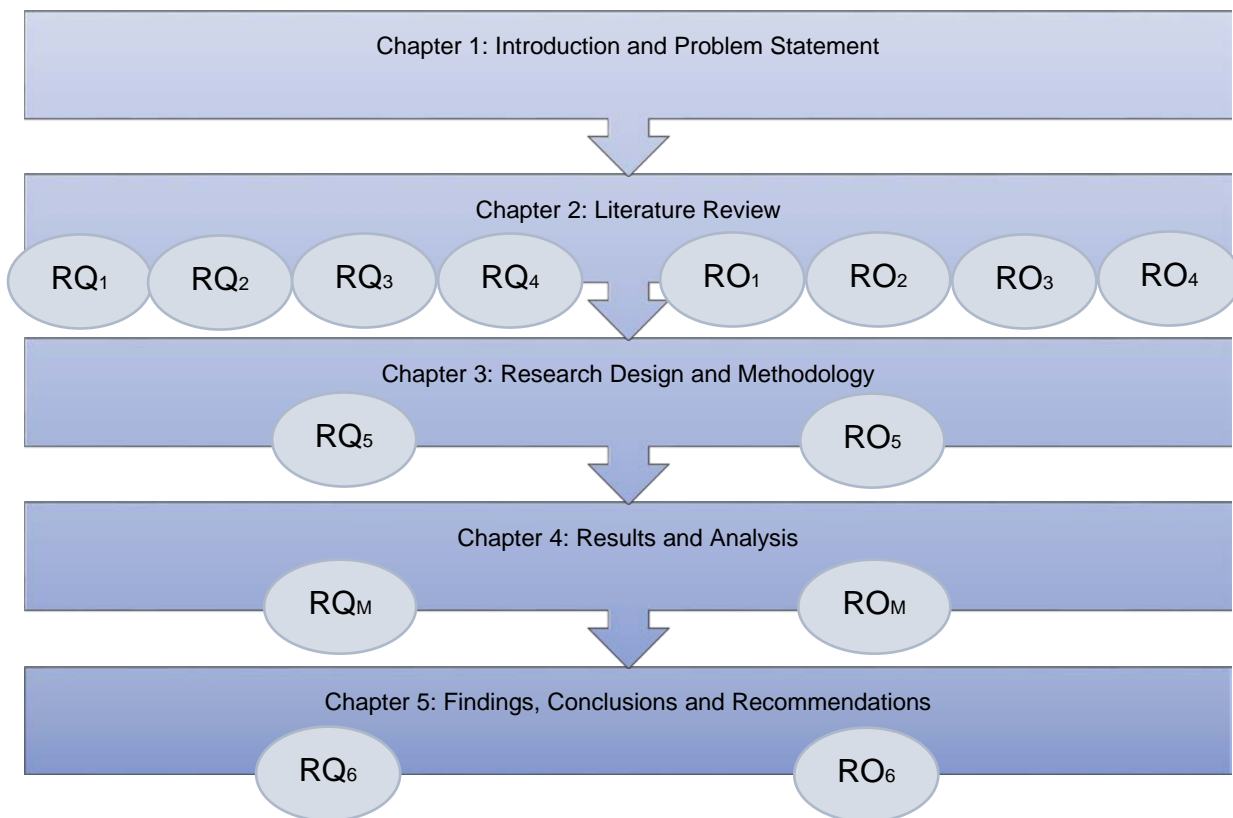
FIGURE 1-2. STRUCTURE AND LAYOUT OF TREATISE

1.11 SUMMARY

This chapter introduced the topic of the study, the main research problem and defined the research questions and research objectives that this study aims to address. Furthermore, it briefly discussed the delimitation and significance of the research and highlighted the research methodology that this study would use. It highlighted the data collection methods and analysis that will be conducted in this study and discussed the ethical requirements needed as stipulated by the Nelson Mandela University to conduct this study.

This chapter concluded with a reported structure and layout that will be used and illustrated in every chapter highlighting every research question and research objective. The next chapter discusses related literature and addresses the first four research questions and their corresponding research objectives, which are achieved by exploring the literature.

2. CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

Chapter 1 provided an outline of this study and introduced the research problem, research objectives and research questions. The literature review conducted in this chapter aims to answer research questions RQ_1-RQ_4. The first part of this chapter discusses definitions of *teams* and *teamwork,* what the benefits of teamwork are and the importance of teamwork on the MBA-programme. A team is a dynamic entity that changes over time. Models of small group development are futher reviewed to understand the characteristics of the starting state (*formation stage*) of a team. Models of team performance are reviewed to understand the relationships between the critical factors that drive team effectivity.

The relationships between *group cohesion*, *group communication* and *goal setting* and a teams' performance will be discussed with reference to this model. It is critical also to consider the environment (organisational, situational) in which the team operates, in order to understand its behaviour fully. MBA study groups are not a typical working group and can be better understood within the context of a collaborative learning group. Numerous studies describe the pitfalls of collaborative learning groups at higher education institutions, especially relating to MBA study groups (Amanjee & Carmichael, 2015; Gantasala, 2015; Rafferty, 2013a; Kelly, 2009; Desplaces, Congden & Boothe, 2007; Chapman, Meuter, Toy & Wright, 2006; Chen, Donahue & Klimoski, 2004; Bacon, Stewart & Silver, 1999).

The second part of the chapter will focus on team development interventions (TDI), especially *social team building*. Team building interventions designed to focus on improving different aspects of the team (goal setting, role clarification, interpersonal relationships and problem-solving) will be investigated. The evidence-based benefits of team building interventions will be reviewed, concerning the influence that it has on *group cohesion*, *group communication* and *goal setting*. The impact of team building on objective performance measures is a contentious issue in the literature, which will be highlighted in this chapter.

The chapter will conclude with a conceptual model linking the social team building event as the independent variable to MBA study group formation *(teambuilding)* as the dependent variable with *group cohesion*, *group communication and goal setting* acting as intermediate variables. This conceptual model will be the subject of an empirical study in Chapter 4.

Figure 2.1 provides an outline for Chapter Two.

Chapter 1: Introduction and Problem Statement

Chapter 2: Literature Review

- 2.1 Introduction
- 2.2 Teamwork
- 2.3 Teambuilding
- 2.4 Conceptual Model
- 2.5 Conclusions

Chapter 3: Research Design and Methodology

Chapter 4: Results and Analysis

Chapter 5: Findings, Conclusions and Recommendations
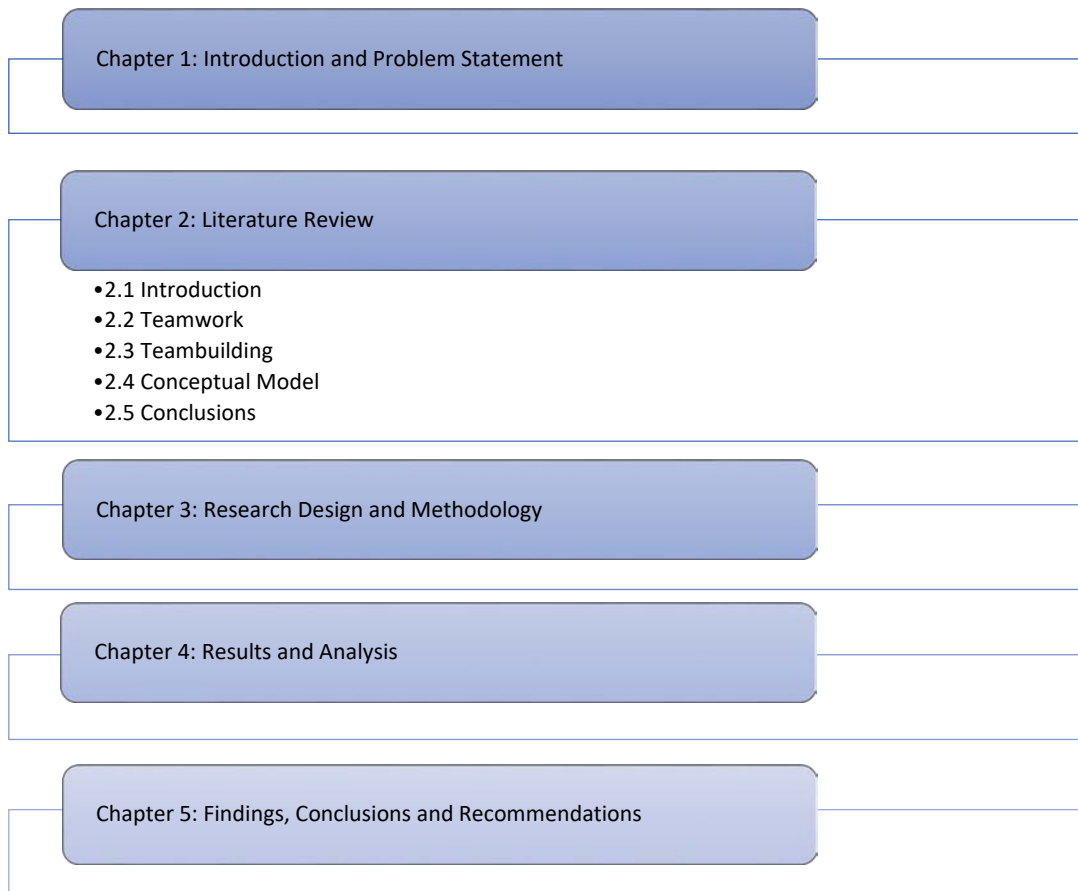
FIGURE 2-1. CHAPTER TWO OUTLINE

2.2 TEAMWORK

A **team** consist of "*a small number of people with complementary skills who are committed to a common purpose, set of performance goals and approach for which they hold themselves mutually accountable*" (Katzenbach & Smith, 2005, p. 3). In a simple working group without these characteristics, the performance of the group is a function of what the members do as individuals. Mazany, Francis and Sumich (1995) argue that a network of personal relationships are required before the team members can work cooperatively. In newly formed groups, there is limited bonding and it takes time to develop these relationships. Cohen and Bailey (1997) noted that popular management literature tends to use the word "team", while academic literature tended to use the word "group". The researchers mention that in some cases the word "team" is considered to be a group with a higher level of functioning. Cohen and Bailey (1997) argued, however, that the distinction between the two terms are not widely

used and therefore the two terms were used interchangeably. In this study, the MBA students formed new groups and the terms "team" and "group" will be used interchangeably.

Several authors use variants of the team definition above, for example, Tannenbaum, Beard and Salas (1992, p. 118) defined a team "*as a distinguishable set of two or more people who interact dynamically, interdependently and adaptively toward a common valued goal/objective/mission and who each have some specific roles or functions to perform*". This definition describes a team as a dynamic entity that changes over time.

Cohen and Bailey (1997) reviewed literature and focussed on studies of teams that produce goods, deliver services, recommend improvements, design new products and determine strategic direction for their organisations. Studies from collaborative learning teams were excluded since these findings cannot be readily generalised to the real working groups.

Cohen and Bailey (1997) discussed four types of teams:

a) *work teams* that consist of units continuously producing goods or delivering services;

b) *parallel teams* pull people from different work units together to make recommendations to the organisation;

c) *project teams* are time-limited and work one-time outputs; and

d) *management teams* that coordinate sub-units under their jurisdiction.

Katzenbach and Smith (2005) use a similar classification as Cohen and Bailey (1997) which separates teams according to their function:

a) teams that provide *recommendations* (parallel teams);

b) teams that *makes* products or deliver services (working teams and project teams);

c) teams that *runs* things (management).

In this context, it must be recognised that MBA study groups are collaborative learning teams and care must be taken when extending the results of this study to the general workplace.

Teamwork includes a wide "*range of activities in which every individual in a team share their knowledge, skills or attitudes with other members of the team so that they could work together effectively and efficiently to achieve specific goals*" (Doan, 2015, p. 40). McEwan and

Beauchamp (2014, p. 233) defines teamwork as "*a dynamic process involving a collaborative effort by team members to effectively carry out the independent and interdependent behaviours that are required to maximise a team's likelihood of achieving its purposes*". Fapohunda (2013, p. 2) asserts that teamwork is "*an integration of resources and inputs working in harmony to achieve organisational goals, where roles are prescribed for every organisation member, challenges are equally faced and incremental improvements are sought continually*".

2.2.1 ADVANTAGES OF TEAMWORK

In the absence of teams, employees are limited to individual efforts alone (Fapohunda, 2013), whereas effective teamwork produces outcomes greater than the sum of the individual members' contributions. Misra and Srivastava (2008) found that teamwork delivers better decisions, improved morale, greater self-actualisation, efficiency, effectiveness and better employee development. Bayley et al. (2007) found that the delivery of services is enhanced through effective teamwork resulting in higher team performance and innovation in healthcare teams. Collaboration in teams further enhances organisational commitment, job satisfaction, reduces staff turnover and absenteeism and has a positive impact on the mental health of the patients (Borrill, West, Shapiro & Rees, 2000). Amos, Hu and Herrick (2005) mentions similar findings, where group cohesion was linked to increased job satisfaction and a lower staff turnover rate. They argued that the support from the team can compensate for other stress related factors in the work environment.

Wuchty, Jones and Uzzi (2007) showed that teams dominate solo authors in the production of knowledge. Partington and Harris (1999) further found that a diverse team has greater creativity, productivity, commitment and participation in a diversity of large and small operations. Amanjee and Carmichael (2015) states that working in teams is a critical workplace skill. Chapman, Meuter, Toy and Wright (2006) believes that learning to work together in a group could be one of the most important interpersonal skills a person can develop since it influences employability, productivity and long-term career success.

The discussion above, clearly indicates why teamwork in work related and leadership teams are important. It is for this reason that the South African Qualification Authority (SAQA)

includes *"Work effectively with others as a member of a team or group in the management of an organisation"* as a critical cross-field outcome for an accredited MBA programme (CHE - Council on Higher Education, 2018, p. 1).

In addition, being part of a collaborative learning group has several advantages. A collaborative learning group can be defined as "*small groups of interdependent individuals that share responsibility for the outcome of semester-long course tasks and projects*" (Rafferty, 2013b, p. 43). A working definition of cooperative learning is further offered by Johnson and Johnson (1999, p. 67) who describe it as "*the instructional use of small groups enabling students to work together towards the maximisation of their own and others' learning.*"

Rafferty (2012) states that group work is widely recognised in many academic disciplines as an essential pedagogical tool when instructing graduate students. The working groups help students to use the strengths of classmates, while experimenting and investigating their abilities within a safe, educational environment. They argue that the benefits of collaborative learning not only leads to an increase in task-related skills, but it helps students to learn critical team-related competencies, such as interpersonal communication, conflict management and compromising. In the collaborative learning model, each member is learning positive interdependence, where they are reliant on other members of the group, meeting face-to-face action, gaining social skills and how to process information as a group (Johnson & Johnson, 1999). This sub-section addressed *RQ₁: Why is group work important on an MBA programme?*

2.2.2 CHALLENGES OF TEAMWORK IN COOPERATIVE LEARNING GROUPS

There are some challenges for effective teamwork within an MBA study group that will be discussed in this section. Firstly, unfavourable organisational conditions can act as a barrier to effective teamwork. Steinburg (1993) reported on a survey conducted on 4500 organisational teams by the Wilson Learning Cooperation in the USA, that reward systems are often based on output performance only and do not focus on *how* the team generated the output. In particular work situations, where the task can be broken up into standalone units and distributed among the group, a simple working group may perform better by

avoiding the networking losses due to potential conflicts, coordination losses and miscommunications (Katzenbach & Smith, 2005). The output would then be the sum of the various inputs by the different members of the group, but the team-based competencies of collaborative learning might not develop.

Collaborative learning groups face another issue, that of *social loafing*, where one or more members of the group merely rely on the other members to do the work (Seltzer, 2016). S*ocial compensation,* in contrast, is where a high performing member of the group does a disproportionate amount of the work (Johnson & Johnson, 2009). This situation can create *negative social interdependence*, where the actions of individuals within the group obstruct the achievement of each other's learning goals or *social dependence*, where the outcome of a member's success is dependent on the actions of another member, but not vice-versa.

Two kinds of conflict can arise within a collaborative learning group. *Task-related* conflict can result in the case where the work assignment is not clear, there is a disagreement on what should be done (Bacon, Stewart & Silver, 1999), or there is disagreement regarding the quality of the submitted assignment (Koppenhaver & Shrader, 2003). *The team-related* conflict could arise due to interpersonal disagreements between individuals in the group. The groups are formed by the business school without any input from the team members, to ensure a good mix of skills, background and diversity.

Team diversity has been shown to improve the creativity of a team (Shaw, 2004). However, differences in the group due to culture, gender and language have been shown to increase the chances of conflict (Chin-Min, 2011) and miscommunication, especially for international students in USA-based MBA-programmes (Rafferty, 2013a). Group work requires additional time and coordination, specifically having weekly face-to-face meetings, which could lead to conflict regarding the scheduling of these meetings. This is especially true for part-time MBA students, who need to work full-time during the day and attend classes at night (Bacon, Stewart & Silver, 1999).

If it is an educational objective for the team to experience and resolve conflict, then this conflict might be constructive (Witteman, 1999), however the presence of conflict has been clearly shown to affect the study group performance negatively and it has a negative impact

on students' perceptions of the MBA-programme (Amanjee & Carmichael, 2015; Krause & Starc, 2010; Bacon, Stewart & Silver, 1999).

It is therefore vital to implement team development interventions that could facilitate group formation at the start of the study programme. In this context, social team building will offer an opportunity for the study groups to interact in a low-pressure environment to learn more about their fellow group members, as well as to reflect on the group interactions that took place during the event.

2.2.3 GROUP DYNAMICS

One of the most influential models for group development has been Tuckman's (1965) description of the stages of development in small groups. He proposed a four-stage model:

Forming: Testing and dependence – In this stage, the group becomes orientated to the task, creates ground rules and tests boundaries for interpersonal and task behaviours. Group members establish relationships with leaders, organisational standards and each other.

Storming: The second stage represents a time of intergroup conflict. This stage is characterised by a lack of unity and polarisation around interpersonal issues. Group members resist moving into unknown areas of interpersonal relations and seek to retain security. Emotional responses may be less visible in groups working toward impersonal and intellectual tasks, but resistance may still be present.

Norming: During this stage, the group develops cohesion. Group members accept each other's idiosyncrasies and express personal opinions. Roles and norms are established. Development of shared mental models and discovering the most effective ways to work with each other. Task conflicts are avoided to ensure harmony.

Performing: In the final stage of the original model, the group develops 'functional role relatedness. The group is a 'problem-solving instrument' as members adapt and

play roles that will enhance the task activities. The group structure is supportive of task performance.

Tuckman and Jensen (1977) published an updated five-stage model, which included the following stage:

> **Adjourning**: Representing the reflective separation of the group at the end of the life of the group.

Bonebright (2010) in a 40-year review of the team development literature after the original Tuckman (1965) model had been proposed, highlighted several limitations of this model. The original model did not represent a representative sample of settings where small group development processes are likely to occur. Specific settings, particularly groups from a therapy-group setting, were significantly over-represented. The review stressed that even Tuckman and Jensen (1977) identified that the original model had a lack of rigorous quantitative research and that they expressed concern with the description and control of independent variables. Furthermore, the model did not address the effect of outside influences on group development.

The traditional models for group development suggest that a team progress linearly through a sequence of developmental phases and that they must complete one phase before entering the next one. A more recent line of research (Morgan, Salas & Glickman, 1993) focusses on the life-span development of naturally occurring *task-driven* work groups in organisations. These teams exist to perform a specific piece of work or solving a particular set of problems. Figure 2-2 shows an overview of the Team Evolution and Maturation (TEAM) model for group development by Morgan, Salas and Glickman (1993). They developed and evaluated this small group developmental model based on quantitative research of US Navy teams.

The TEAM model describes a series of developmental stages through which newly formed, task-orientated teams are proposed to evolve. As shown in Figure 2-2, the TEAM model has nine stages of development. The model goes through the familiar forming-storming-norming-performing stages of Tuckman (1965), but then includes a *cyclical* process where inefficient patterns of performance are identified (performing-I), reevaluation and transition (re-norming) result in a refocusing to produce effective performance (performing-II) and completion of team

assignments (conforming). This development might be recycled to an earlier stage as necessitated by the failure to achieve the required performance. Also, the core stages of the model are preceded by a pre-forming stage that recognises the forces from the environment on the team. They also split *taskwork* related development from *teamwork* related development and argue that both needs to be developed simultaneously for the team to be effective.
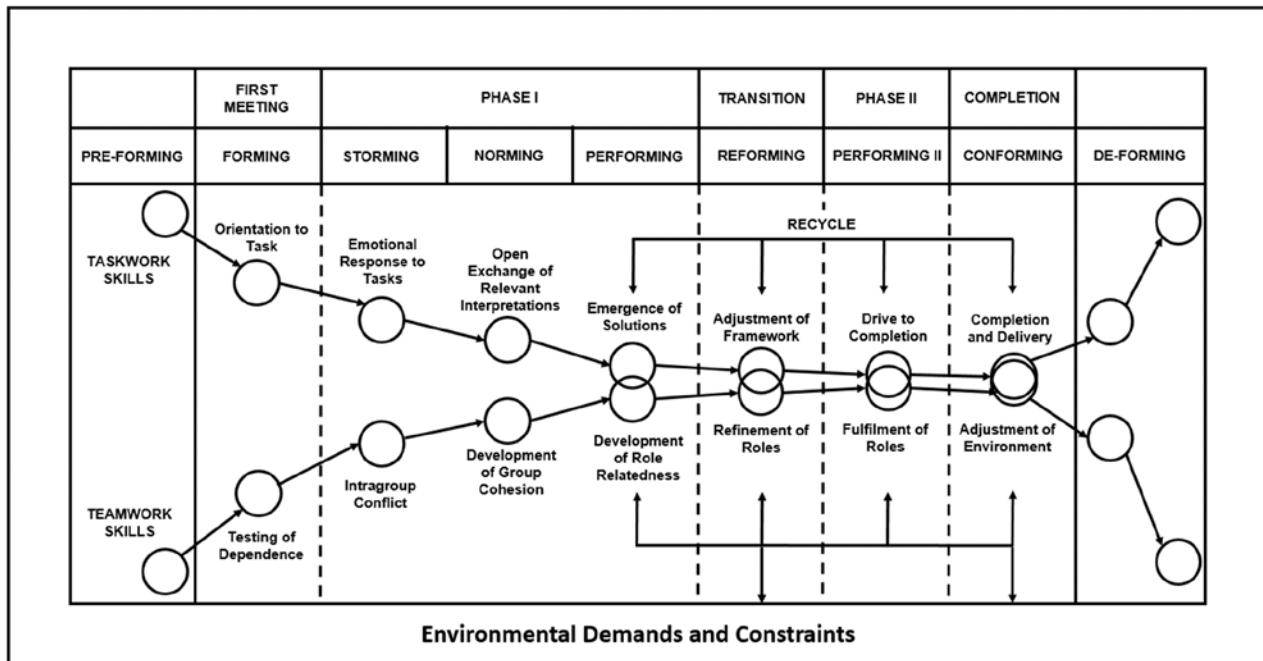
FIGURE 2-2. TEAM MODEL FOR GROUP DEVELOPMENT (ADAPTED BY AUTHOR FROM MORGAN, SALAS AND GLICKMAN, 1993)

In the context of MBA study groups, the TEAM model of Morgan, Salas and Glickman (1993) addresses some factors that the original group development model of Tuckman (1965) did not. Firstly, that group development process is cyclical. Thus, the performance outcome of one group assignment might result in team changes that take the study group back to an earlier stage of development. Secondly, the team might be performing adequately by relying on taskwork competencies only, without developing teamwork competencies. Thus, it is necessary to separate their development. Lastly, it includes the influence of the environmental factors such as the individual study group members' KSA's (knowledge, skills and attitudes), resource constraints (e.g. time scarcity of a part-time MBA-programme), organisational reward systems (all group members receive the same mark) and the fact that

the groups are pre-allocated on the development path of the team. In the TEAM model, these factors are included as the *pre-forming* stage.

The role of a social team building intervention at the start of the MBA programme would thus be to enhance *teamwork* competencies by progressing the group through along the developmental path. Less emphasis must be placed on *task-work* competencies since the team building event typically involves non-work related activities. This sub-section addressed *RQ$_2$: What are the stages in group development?*

2.2.4 CHARACTERISTICS OF EFFECTIVE TEAMS

Cohen and Bailey (1997) characterised group effectiveness into three major dimensions according to the team's impact on a) quantity and quality of outputs, b) member attitudes and c) behavioural outcomes. *Objective performance* criteria include productivity, response times, quality of products and customer satisfaction. *Attitudinal* measures include employee satisfaction, commitment and trust in management, while *behavioural* measures include absenteeism, turnover and safety.

Several models of group effectiveness exist as mentioned in Morgan, Salas and Glickman (1993). These include Stimulus-response, Learning theory, Mathematical and Input-Process-Output. All these models attempt to understand the relationships between the variables that could determine the performance of a group.

McGrath (1964) proposed a simple input-process-output (IPO) model for group effectiveness. This model (Figure 2-3) states that the performance of the group is a function of input variables consisting of *individual*-level factors, *group*-level factors as well as the *environment* in which the team operates. The performance of the team is moderated by the group processes such as communication, coordination, conflict resolution, problem-solving and decision making within the group. The outputs include objective performance measures as well as other outcomes not directly related to products produced. This model was then further expanded by other researchers (Gladstein, 1984; Goodman, Ravlin & Argote, 1986; Hackman, 1983, 1986; Tannenbaum, Beard & Salas, 1992).
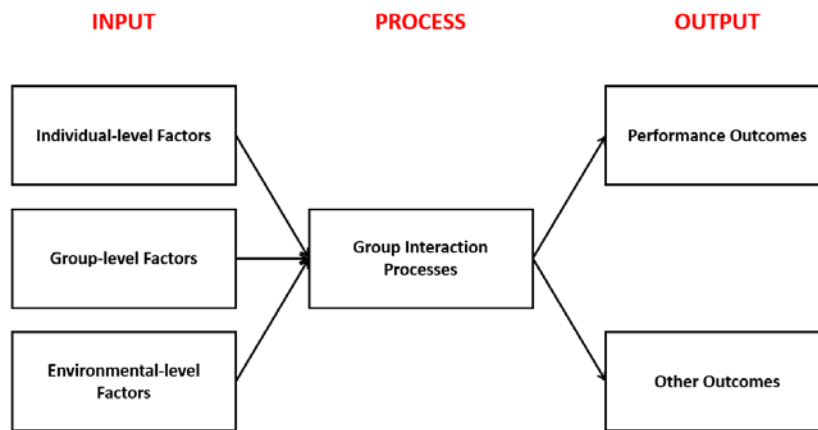
FIGURE 2-3. INPUT-PROCESS-OUTPUT TEAM EFFECTIVENESS MODEL (ADAPTED BY AUTHOR FROM MCGRAPH, 1964)

Tannenbaum, Beard and Salas, (1992) in their comprehensive review on the effectiveness of team building interventions adapted the IPO model of team effectiveness to the one shown in Figure 2-4. **Inputs** to the model include the *individual* characteristics such as general abilities, attitudes and mental models. *Team* characteristics such as group cohesion, team climate and group efficacy, the belief within a group to perform (Collins & Parker 2010), form part of the inputs. *Task* characteristics such as the complexity of the task, are also an essential factor that needs to be considered. *Work structure* refers to the way in which the team approaches a task and the norms within the team. **Throughput** refers to the processes that operate within the team and include the way in which goals are decided, communication patterns within the group, conflict resolution strategies, problem-solving strategies and the way in which the work tasks are coordinated. **Outputs** not only include measurable objective performance measures, but also include the changes within the team on a group-level and an individual-level that occur during team interactions.

The other notable feature of this model is that it emphasises that the group effectiveness is not a linear process, but follows a cyclical process. The team's performance output on one task will result in team/individual changes that create a feedback loop to influence how the team will perform on future assignments. Exclusive focus on objective measures that neglects team-work competencies (e.g. how the results were obtained), could result in negative feedback that would impact future performance. In this model (Figure 2-4), an *effective* team will emerge over a period to produce sustainable outputs. Tannenbaum, Beard and Salas, (1992) argued that Team Development Interventions (discussed in the following section)

impact the Input Characteristics and Team Processes, which then result in Team Changes that will indirectly improve the performance of the team on future tasks via the feedback loop.
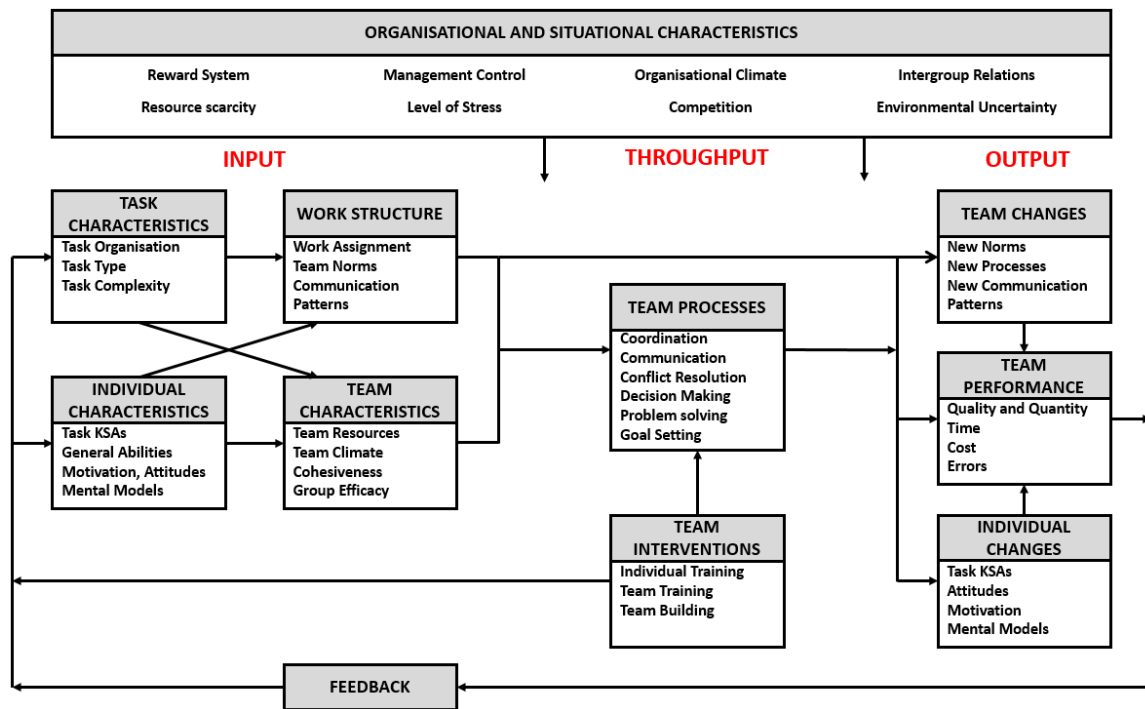
FIGURE 2-4. TEAM EFFECTIVENESS MODEL (ADAPTED BY AUTHOR FROM TANNENBAUM, BEARD AND SALAS, 1992)

This sub-section addresses the research question *RQ3: What makes an effective MBA study group?* It is clear from the model in Figure 2-4 that a number of factors could influence the effectivity of a team. This study of MBA group effectivity will specifically focus on *Group cohesion*, *Group communication* and *Goal setting*. These factors are considered to be specifically important during the early stages of group development.

2.2.4.1   EFFECT OF GOAL SETTING ON TEAM PERFORMANCE

The effects of *Goal setting* on the performance of an individual or team can be understood through goal-setting theory (Locke, 1996). The two attributes of goals that were studied were the *difficulty* and *specificity*. Locke (1996) found that more difficult goals lead to higher achievement if the individual is committed and has the necessary ability. The more specific or explicit the goal, the more precisely performance can be regulated. Also, goals that are both specific and difficult lead to the highest performance, but the individual must be committed to it. Locke (1996) argue that high commitment to the goal is attained when the

individual is convinced that it is important and if they believe it to be achievable (self-efficacy). Self-efficacy refers to the belief in an individual that they have the necessary abilities to pursue a goal successfully. In summary, the goal-setting effect on performance has been shown to depend, on factors such as goal commitment, task complexity and feedback (Latham, Locke & Fassina, 2002).

Kleingeld, van Mierlo and Arends (2011) conducted a meta-analytic study of the effect of goal-setting on *group* performance and found that goal-setting theory can be extended to groups. According to the model of Tannenbaum, Beard and Salas (1992) it is considered to be a *team process.* Difficult specific goals resulted in increased performance compared with non-specific goals. Kleingeld, van Mierlo and Arends (2011) investigated possible moderators of performance such as Task Interdependence and Task Complexity. Task Interdependence referred to "*the degree to which group members have to share or exchange information, materials, or expertise to achieve the desired group performance*", while group Task Complexity refers to the "*number of acts and information cues, the relationships between the acts and the changes in the acts and cues*" for a given task (Kleingeld, van Mierlo & Arends, 2011, p. 1290).

Task complexity has been shown to be a moderating variable for individual performance (Wood, Mento & Locke, 1987). Kleingeld, van Mierlo and Arends (2011) found however that both Task Interdependence and Task Complexity did not moderate the effect of group goals on performance. "*Ego-centric*" goals that aim to maximise an individual's performance in a group had a particularly negative effect, while "*group-centric*" goals that aim to maximise an individuals' contribution to the group performance had a positive effect. *Team efficacy* is the "*collective perceived capability of a team to work together to achieve tasks*" (Collins & Parker, 2010, p. 1005). This measurement has been shown to have a positive relationship with objective performance measures since it will influence the teams' commitment to difficult goals, how it responds to setbacks and how they discover successful task-strategies (Locke, 1996), all essential characteristics of a team.

2.2.4.2   *EFFECT OF GROUP COHESION ON TEAM PERFORMANCE*

Group cohesion is defined as a "*dynamic process which is reflected in the tendency for a group to stick together and remain united in the pursuit of its goals and objectives*" (Carron,

1982, p. 123). Group cohesion is a *team characteristic* according to the model of Tannenbaum, Beard and Salas (1992). The opposite of cohesion is social loafing (Meeuwsen & Pederson, 2006), where individuals working together on a task tend to exert less effort than when performing the same task alone. The negative effects of social loafing were found in participants of physical and cognitive tasks. Troth, Jordan and Lawrence (2012) noted that several researchers (Harrison, Price, Gavin, & Florey, 2002; Slavin, 1992) found that low study group cohesion is a problem and it has a negative impact on performance. Higher team cohesion is strongly associated with greater success in sports performance (Carron, Colman, Wheeler & Stevens, 2002).

Deeter-Schmelz, Kennedy and Ramsey (2002) used the IPO model of team effectiveness and evaluated the effect of team characteristics such as cohesion, team size and gender diversity on team performance for marketing study groups. They found that cohesion directly influenced "*teamwork*" a team process variable and indirectly the performance and goal achievement of the group.

There has however been an ongoing controversy regarding the structure and measurement of cohesion (Cota et al., 1995). Cohesion is typically seen as a multi-dimensional construct where group members are assumed to hold two predominant types of social cognitions about the cohesiveness of the group: *group integration* and *individual attractions to the group*. There are also two orientations in a group members perceptions: *task* and *social* aspects of group involvement. Group Cohesion is typically measured using the 18-Item Group Environment Questionnaire (GEQ), which assesses the four manifestations of cohesion: Group Integration-Task, Group Integration-Social, Individual attractions to Group-Task and Individual attractions to Group-Social (Carron, Widmeyer & Brawley, 1985).

According to Bandura (1986) teachers have a strong influence on study group cohesion. The role of the teacher is to set up efficient learning environments that will enhance team efficacy and group cohesion. Meeuwsen and Pederson (2006) argues that greater study-group cohesion can be achieved by working on tasks focussed on a common goal rather than working through activities focussed on creating social bonds without a goal-directed effort. They adapted the GEQ to examine cohesion in collaborative learning groups. The first measurement of cohesion was administered four weeks into the programme and repeated during the learning programme. They found that students are most attracted to their groups

due to the tasks and not so much the social aspects and that the average scores did not change over time.

Troth, Jordan and Lawrence (2012) studied whether individual student perceptions of group cohesion are determined by their level of emotional intelligence and whether their communication skills mediate this relationship. They found that there is a positive relationship between communication effectiveness and group cohesion. The effect of management of others' emotions on group cohesion was mediated by communication. They recommended that communication training could help improve cohesion in study groups.

2.2.4.3   EFFECT OF GROUP COMMUNICATION ON TEAM PERFORMANCE

Communication is an exchange of information between a sender and receiver. It is therefore critical for teams to encourage an open communication flow between team members to operate most effectively (Cooke, 2004). Deficiencies in verbal communication appear at all levels in organisations. This is especially true for interdisciplinary teams where misunderstandings, language difficulties, interruptions and hesitation to speak against authority have been reported (Sutcliffe, Lewton & Rosenthal, 2004).

Effective *group communication* has been shown to be an essential prerequisite for a team's structure, collaboration and task performance (Salas et al., 2008b) and therefore a critical *team process* (Tannenbaum, Beard & Salas, 1992) that affects the ultimate performance of a team in multiple ways. The functional theory of small group communication is concerned with the results or outcomes of group behaviours and structures. This perspective sees communication as a tool group members use to solve problems and make decisions.

Communication is the most critical element in establishing a positive group climate (Napier Group, n.d.). Fapohunda (2013) argues that effective groups use open communication to clarify roles, resolve conflict and give honest feedback. Lencioni (2002) argues that a lack of *trust* within a team can compromise open communication, which could lead to dysfunctional team outcomes. This sub-section addressed *RQ₃*: *What makes an effective MBA study group?*

2.3   TEAM DEVELOPMENT INTERVENTIONS

With the rise of teamwork comes the need for interventions designed to enhance teamwork effectiveness. As discussed in the previous section, effective teams require both task-work and team-work competencies. *Team development interventions* (TDI) are defined as "*a systematic activity aimed at improving requisite team competencies, processes and overall effectiveness*" (Lacerenza et al., 2018, p. 518). TDIs have been applied to a number of domains including healthcare (Amos, Hu & Herrick, 2005; Bayley et al., 2007; DiMeglio et al., 2005), education (Cullen & Calitz, 2015; Chen, Donahue & Klimoski, 2004; Clayton, 2015; Cox & Bobrowski, 2004; Deeter-Schmelz, Kennedy & Ramsey, 2002; Desplaces, Congden & Boothe, 2007; Mathieu & Rapp, 2009; Mitchell, 1986), sports (Carron & Spink, 1993; Gordon, 2013), military (Eden, 1985; Tannenbaum, Beard & Salas, 1992) and business (Morrison & Sturges, 1980).

Lacerenza and co-workers (2018) in their review grouped TDIs into four groups namely *team building*, *team training*, *leadership training* and *team debriefing*. *Team training* is a formalised, structured learning experience with pre-set objectives and a curriculum that targets specific team competencies. It focusses on improving the efficiency of the team. Klein et al. (2009, p. 3) consider team training as an activity that is "*skill-focussed, typically includes a practice component and is done in the context of the work environment.*" Tannenbaum, Beard and Salas (1992, p. 126) consider team training as "*a systematic effort to facilitate the development of job-related knowledge, skills and attitudes.*" Team training has been implemented across various disciplines (healthcare, engineering and education) and has shown to have strong empirical evidence for improving team effectiveness (Salas et al., 2008; Hughes et al., 2016).

Leadership training refers to interventions systematically designed to enhance leader knowledge, skills, abilities and other attributes. The goal of these interventions is to ensure that the leader acts effectively in their assigned leadership roles to ensure team effectiveness. This type of intervention has been shown to improve learning, information transfer and organisational outcomes by up to 29% (Lacerenza et al., 2017).

Team debriefing involves a discussion by the team members to reflect on a performance episode or experience. They discuss what happened during the event, uncover problems and improvement areas, confirm successes and develop a plan for future performance (Tannenbaum, Beard & Cerasoli, 2013). It can also be used to foster a shared understanding of roles and responsibilities within the team and about the teams' skills, shortcomings and priorities.

Team building is a collection of formal and informal team-level interventions that focus on improving social relations and clarifying roles, as well as solving the task and interpersonal problems that affect team functioning. Team building works by assisting individuals and groups to examine, diagnose and act upon their behaviour and interpersonal relationships. In contrast to team training, Klein et al. (2009) describe team building as an intervention that do not target skill-based competencies, is often not systematic and is typically done in settings that do not approximate the actual performance environment. Team building interventions are the subject of this study. This topic will be elaborated on in the following section.

2.3.1 TEAM BUILDING INTERVENTIONS

Team building interventions all share a conceptual similarity but often differ concerning their focus. Earlier work by Beer (1976, 1980), Buller (1986) and Dyer (1987) divided the team building interventions into four categories according to their *primary* focus. The four objectives are:

- *Goal setting* – alignment around goals. Goal setting team building interventions emphasise the importance of clear objectives and individual and team goals. Activities are arranged whereby the group members become involved in action planning to identify success and failure and strengthen motivation and foster a sense of ownership. Many teams come up with a team charter during this intervention.

- *Interpersonal approach* – building effective working relationships. Interpersonal team building interventions use activities that emphasise teamwork skills such as communication, providing and receiving support, development of mutual trust and open communication between team members. The interpersonal approach focusses

on improving the interpersonal relations in the group. This approach aims to enhance group trust and encourage mutual supportive and non-evaluative communications within the team.

- *Role clarification approach* – reducing team members' role ambiguity. Role clarification team building interventions create an understanding of their own and others' members' roles and duties. It is intended to reduce ambiguity and emphasises the members' interdependence and the value of having each member focus on their role in the team's success. This approach involves discussion and negotiation among team members regarding each of their respective roles. Role conflict and role ambiguity have been shown to result in anxiety, dissatisfaction and potential turnover (House & Rizzo, 1972).

- *Problem-solving* – finding solutions to problems in the team and working together to find answers. Problem solving team building interventions use a more general approach where team members identify significant issues, generate relevant information, engage in problem-solving and action planning and implement and evaluate action plans.

Social team building typically involves some non-work related problem-solving tasks performed by a team during a one or two-day off-site excursion. The event can be used to identify how a team solves problems and where potential bottlenecks can occur. It also helps to improve interpersonal relationships, since the group members are forced to interact outside of the work environment. Figure 2-5 shows where social team building interventions could be classified as a team development intervention.
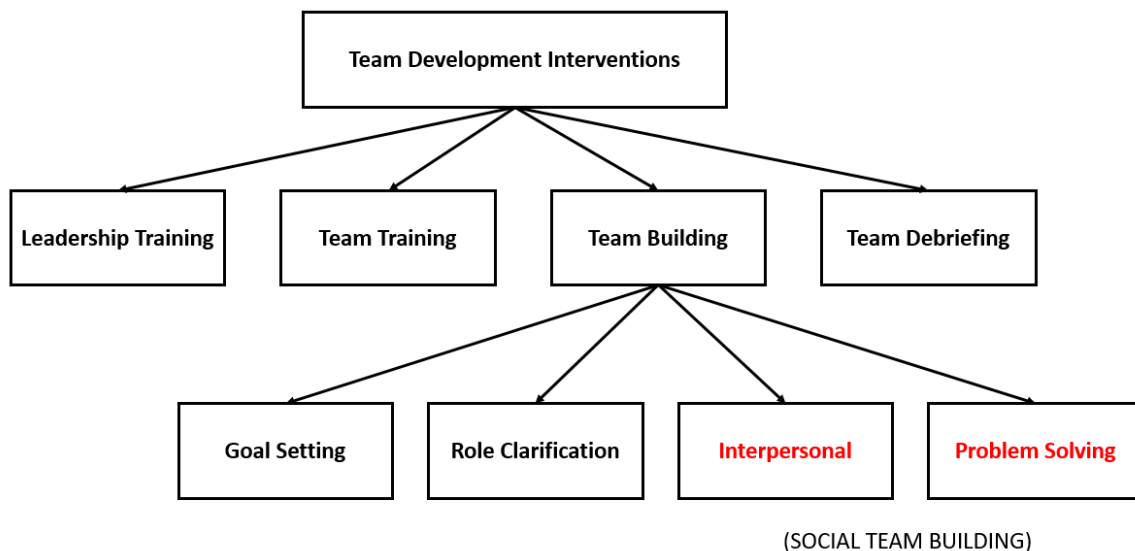
FIGURE 2-5. TYPES OF TEAM DEVELOPMENT INTERVENTIONS

2.3.2 MEASURING EFFECTIVENESS OF TEAM BUILDING INTERVENTIONS

Tannenbaum, Beard and Salas (1992) conducted a meta-analysis on the studies relating to the effectiveness of team building interventions during the period 1980-1990. They provided definitional clarity regarding "*teams*" and "*teambuilding*", something which the earlier reviews expressed as a concern (Woodman and Sherwood, 1980; DeMeuse and Liebowitz, 1981; Buller, 1986). The studies provided an adapted input-process-output model by integrating various literature sources and showed how team development interventions could impact teams and ultimately influence their performance (see Figure 2-4).

Tannenbaum, Beard and Salas (1992) identified seventeen suitable empirical studies of team building interventions were identified for this period. The studies were classified according to the research design, team building approach and the reported outcomes. In agreement with the reviews of studies conducted pre-1980, they critiqued the research designs used in the studies. Only six of the studies in the analysis used True Experimental (2) or Quazi-Experimental (4) designs. Four of these six studies reported positive *attitudinal/perception* changes, while only one showed positive *behavioural performance* changes in the teams as a result of the intervention. Tannenbaum, Beard and Salas (1992) argued that according to their model, the further the dependent variable is removed from the immediate control of the team, the less likely it will show an improvement.

Salas, Rozell, Mullen and Driskell (1999) conducted another meta-analytic study on the effects of team building on performance. They reported that previous reviews showed no convergence regarding which studies to include and that although most studies reported positive findings regarding attitudinal changes, the effect on objective performance measures was inconclusive. Teams from abnormal populations were excluded and only studies that used a precise test for the impact of team building on either an objective performance or a subjective measure of performance were included. Case studies, T-groups and managerial grid interventions were also excluded from the analysis. The study included a total of 11 studies over 30 years, representing 2806 team members in 307 teams.

Salas, Rozell, Mullen and Driskell (1999) reported an overall non-significant ($p=0.45$) positive effect of team building interventions on performance. The result was non-significant ($p=0.70$) *negative* when considering objective performance measures only. The effect was significant ($p=0.004$) positive effect when considering the subjective performance measures. The only team building component that predicted improvement on performance was *role-clarification* ($p<0.001$) interventions. The overall effect of team building decreased with the size of the team. This was true for both objective and subjective measures of performance. The duration of the team building intervention did not influence the effect on performance. They concluded that 99% of the variability in the performance of a team is due to factors other than knowing whether or not the team went through a team building intervention.

Klein et al. (2009) extended the meta-analysis of Salas, Rozell, Mullen and Driskell (1999) by assessing a more extensive database and examining a broader set of outcomes. They investigated the theoretical model shown in Figure 2-6 and included 20 studies, representing 60 effect sizes, 1562 teams each with a median team size of 9 members. After an exhaustive analysis, they found that team building has a moderate effect across all team outcomes. The impact of team building was most strongly correlated to affective and process outcomes, which is in agreement with previous findings where the influence of team building on objective performance measures is still inconclusive.
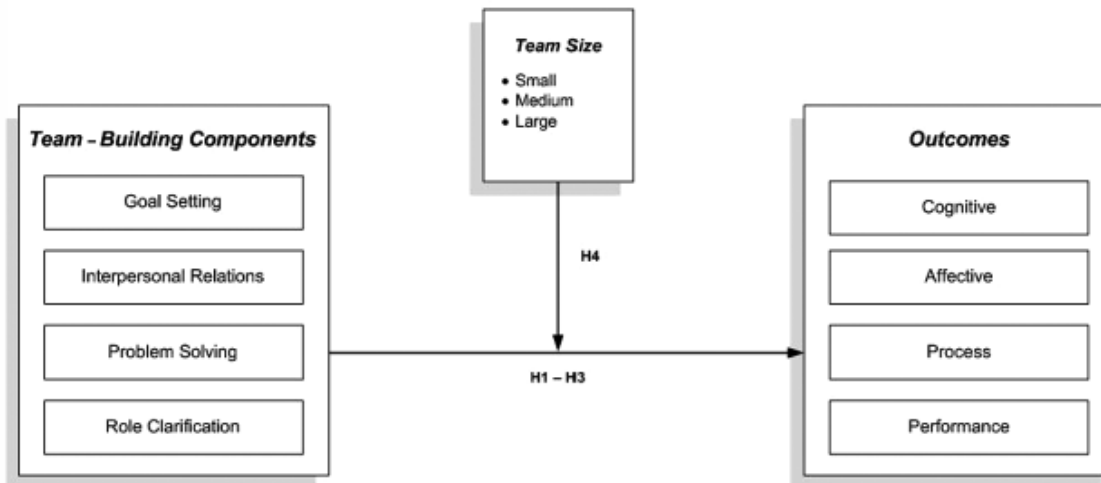
2.3.2.1 EFFECT OF TEAM BUILDING INTERVENTIONS ON GROUP COMMUNICATION

Team building interventions that focus on improving *group communication* were mostly applied in healthcare (Yi, 2016; Amos, Hu & Herrick, 2005; Bayley et al., 2007; Cohen & Ross, 1982). Effective closed-loop communication has been identified as an essential prerequisite to prevent medical mishaps (Salas et al., 2008b). Amos, Hu and Herrick (2005) found that the participants reported that listening skills and open communication improved after the team building intervention, resulting in a 50% reduction in staff-turnover rate.

Bayley et al. (2007) found a small improvement in communication skills in nursing teams three months after the team building intervention. This effect disappeared after six months. Hart, Vroman and Stulz (2015) applied an experiential learning intervention on MBA-students. They worked at non-profit organisations where they were required to conduct a communication audit to measure communication effectiveness. The students reported an increase in both verbal and written communication as a result of the intervention.

It should be noted that the team building interventions focussing on communication have some overlap with team training, as it was often concentrated on a specific skill, in this case, communication. Tannenbaum, Beard and Salas (1992) argued that the overall effectiveness of team building interventions are determined to the effect at which it addresses true team

deficiencies, thus if communication is a problem (such as in healthcare), then interventions improving communication will have an impact on the performance of the team.

2.3.2.2   EFFECT OF TEAM BUILDING INTERVENTIONS ON GROUP COHESION

Team building interventions that focus on improving *group cohesion* were mostly applied in sports where there is a strong link between high team cohesion and performance (Carron, Colman, Wheeler & Stevens, 2002). In their meta-analysis of 46 studies of sports teams, the authors found a moderate to large relationship between group cohesion, as measured using the Group Environment Questionnaire (Carron, Widmeyer & Brawley, 1985) and performance.

Carron and Spink (1993) found that participants in the team intervention showed higher individual attractions to group task (ATG-Task) than participants in the control condition. However, Prapavessis, Carron and Spink (1996) found no change in perceptions of cohesion in an 8-week intervention programme conducted on soccer teams. They argued that a team building intervention should only be implemented after a team skills assessment. The intervention should thus be designed to address true deficiencies in the team.

Senécal, Longhead and Bloom (2008) found that a goal-setting team building intervention resulted in higher perceived team cohesion as compared to a control group for 86 female basketball players. Similar findings were reported by Stevens and Bloom (2003) where 16 softball players' perceptions of cohesion measured higher than the control group after the intervention.

Team building interventions targeting cohesion have also been applied in education. Cullen and Calitz (2015) investigated the effect of social team building on group cohesion for 143 MBA students and found a positive relationship between the event and cohesion. Shivers-Blackwell (2004) applied an outdoor team building intervention on MBA-students and found that "*teamwork attitudes*" (*team efficacy*) before the intervention and successful completion of the outdoor initiative had a significant relationship with team viability measures (Group Cohesion), while performance on the intervention did not have any connection with the team viability measures. DiMeglio et al. (2005) found an increase in cohesion. Job enjoyment and staff turnover resulted after a team building intervention applied to nurses.

2.3.2.3 EFFECT OF TEAM BUILDING INTERVENTIONS ON GOAL SETTING

Goal setting as a team building intervention can be used to align the efforts of the group (Beer, 1976). Widmeyer and Ducharme (1997) described how goal-setting leads to an increase in performance and cohesion for teams by applying goal-setting theory (Locke, 1996). Widmeyer and Ducharme (1997) mentioned that it is especially important to foster *team efficacy* towards the accomplishment of long-term goals. Senécal, Longhead and Bloom (2008) found that a goal-setting team building intervention resulted in higher perceived team cohesion as compared to a control group for 86 female basketball players.

There is limited literature regarding *changes* in team goal-setting (as a *team process*) as a result of a team building intervention. Cullen and Calitz (2015) investigated the effect of a social team building intervention on group cohesion. They found a positive relationship between the intervention and goal-setting during the event. However, the directionality of this causal relationship was not investigated.

This study will focus on the *affective* outcomes (*group cohesion*, *group communication* and *goal-setting*) of team building interventions.

2.3.3 TEAM DEVELOPMENT INTERVENTIONS FOR MBA STUDENTS

Numerous studies of team building/training interventions have been conducted on MBA-students. Mazany, Francis and Sumich (1995) evaluated the effectiveness of an outdoor workshop as a *team building* intervention. They mention that businesses that sponsor development interventions want to see the effect thereof on performance. They discuss two types of adventure-based training interventions, namely outdoor-based and wilderness-based. Outdoor-centred training the participants live and eat indoors, but most of the training consists of structured outdoor activities. During wilderness-based programmes, the participants live outdoors and engage in more strenuous activities such as mountain climbing, whitewater rafting and sailing. Mazany, Francis and Sumich (1995) collected data from various Fortune500 companies and found that outdoor-centred programmes focussed on teambuilding (90%), building self-esteem (50%), leadership (40%) and problem-solving (20%), with many of the programmes having multiple objectives.

Mazany, Francis and Sumich (1995) used a team building intervention that consisted of some case studies and a computer simulation where teams make decisions about products, marketing mixes and competitive strategies. The students were then asked to complete a questionnaire that measured the decision-making process, participation, efficiency, communication and group experiences in the group before the intervention and after the intervention. No control group was used for this study. Significant differences in the pre- and post-workshop measures were found. Mazany, Francis and Sumich (1995) noted that most outdoor programmes which offer evaluations are entirely dependant on a post-event participation questionnaire (Wagner, Baldwin & Roland, 1991). More rigorous research methods are needed.

McGraw and Tidwell (2001) describe a *team training* intervention that was applied at the start of the programme to improve student readiness for working in groups. They discussed all the challenges that collaborative learning groups experience and the possible legal implications that it may have for the business school. The intervention consisted of three parts, an introductory workshop on group work theory, a group exercise to prepare a presentation on their previous experiences on group work and a case study on a challenging group work situation. The workshop helps the students to understand which behaviours are acceptable in group work and which are not. They did not evaluate the effectiveness of this intervention.

Mitchell (1986) applied a *team building* intervention based on the theory that the disclosure of internal frames of reference will improve a group members' working relationship. This work has been described by Tannenbaum, Beard and Salas (1992) as an excellent example of methodological rigour in the evaluation of team development interventions. Each team has been randomly assigned to one of three experimental conditions: alignment theory-based intervention, a conventional team building intervention and a control condition (no intervention). They used the Barret-Lennard Relationship Inventory (Barret-Lennard, 1978) and conducted measurements before, immediately after and two months after the interventions were conducted. The results show that the alignment theory-based intervention had substantial improvements shortly after the intervention and two months later. The improvement was significantly greater than the control group and was greater (not statistically) than the conventional team building intervention.

Gooding and Keys (1990) used management games that simulate the business environment in their introductory course on the executive MBA programme. They mentioned that on such a programme there is usually no opportunity to conduct controlled studies. The evaluation consisted of post-intervention feedback from the students. The participants reported that they formed cohesive units more quickly because of intergroup competition and because of the interdependent work required on the game.

Rushmer (1997) took a different approach to evaluate the impact of team development interventions by investigating what happens to the team *during* team building. Rushmer (1997) argued that it is inappropriate to use a "hard" measure of a "soft" intervention. Team building interventions should only be seen as a start, with the team in the process of becoming. The team should be considered as a dynamic entity. The team building interventions merely kick off a process that hopefully continues as the team returns to its organisations.

Data were collected during a three-day outward bound residential team building course for full-time MBA students. They used an open-ended questionnaire where each student was asked to recount, positive and negative events on a daily basis. The emergent themes from the respondents include "*Getting to know each other*", "*the refusal of a leader to emerge*", trying new things for the "*benefit of the team*", "*team spirit, having fun and motivation*" and task orientation (Rushmer, 1997, p. 319). They recommended that team building interventions should a) allow the team members to mix and talk freely and b) facilitate a contribution from all members of the team towards task accomplishment (high task-interdependence).

Cullen and Calitz (2015) investigated the effects of a social team building intervention on group cohesion. The intervention featured the popular TV-series "*a minute to win it*" game and was applied to MBA students at the start of the academic programme as part of their orientation. The goal of the intervention was to improve cohesion in the group. They recorded perceptions of the participants on the event, group processes/characteristics (cohesion, goal setting and communication) experienced during the game and the level of team building immediately after the intervention. They found a statistical relationship between the intervention and group cohesion and goal-setting.

Additional studies of the impact of TDIs on MBA-students included Clayton (2015); Cox and Bobrowski (2004); Gantasala (2015); Mathieu and Rapp (2009); Deeter-Schmelz, Kennedy and Ramsey (2002); Shivers-Blackwell (2004); Tonn and Milledge (2002); Oakley, Felder, Brent and Elhajj (2004); Hobson et al. (2014) and Bowen (1998). They all mainly show improvements on affective group-characteristics/processes. Most of the studies used simple pre-/post-test measurements to show the effect of the interventions, without a randomised control group. The preceding discussion answered the *RQ4: What are the benefits of social team building events on MBA study groups?*

2.4   CONCEPTUAL MODEL

The effectiveness of study groups in an MBA programme can be viewed within the input-process-output model of Tannenbaum, Beard and Salas (1992) (Figure 2-4). Inputs to this model consist of individual characteristics, task characteristics, group characteristics and work structures that the team follows. As mentioned previously, the outputs are moderated by group processes during an activity.

At the forming stage, the group has not worked together since the team members have just met. Thus the inputs such as the type of task, individual characteristics and the environmental constraints would determine the outputs at the start of the programme. Interventions, both at the individual or team level will influence either the group processes or the input, which then leads to changes in the team or the individuals, which then feeds back to the performance/effectiveness of the team, according to Tannenbaum, Beard and Salas (1992). This model was then reduced to the factors relevant for this study as shown in Figure 2-7.

Group cohesion is considered to be vital team characteristic, while *group communication* and *goal-setting* are considered team processes, as discussed previously. The model proposes that the social team building intervention influences the input and team process variables, which then lead to changes in the team (*team building*). These team changes will then affect the performance of the team via the feedback mechanism for future tasks. *Team efficacy* as discussed previously is a team characteristic that influences the performance of a team (Collins & Parker, 2010). Thus, one of the goals of the social team building intervention during the formation stage would be to establish a core belief in the team that they are capable of

success in the study programme. *Team efficacy* will form the basis of our measurement of *team building* during the team building intervention.
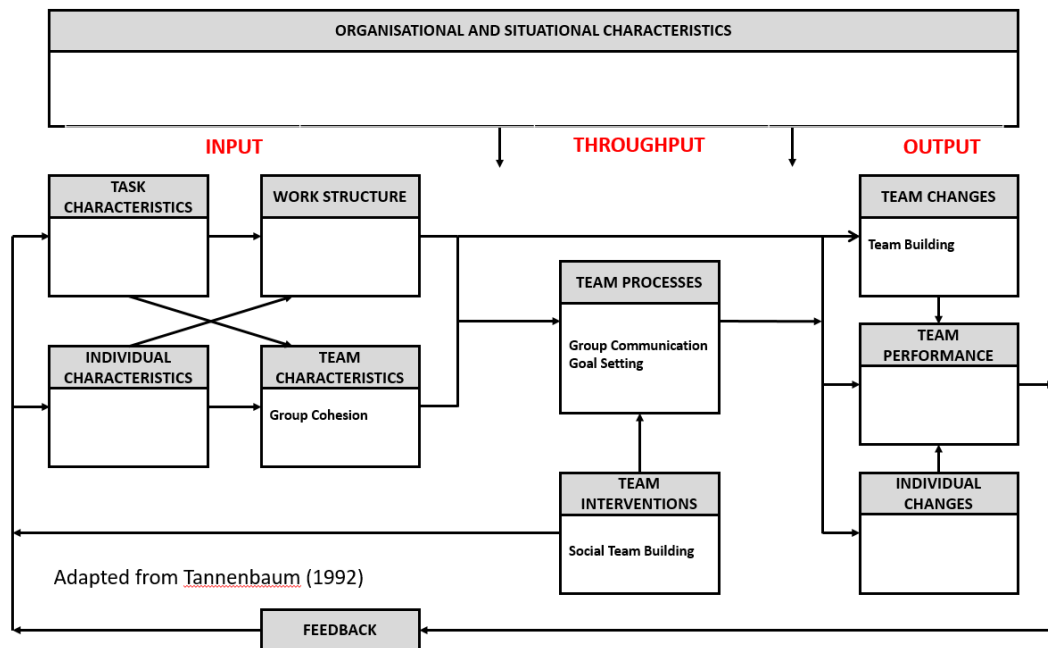
Figure 2-8 illustrates the conceptual model that will be used for this study.
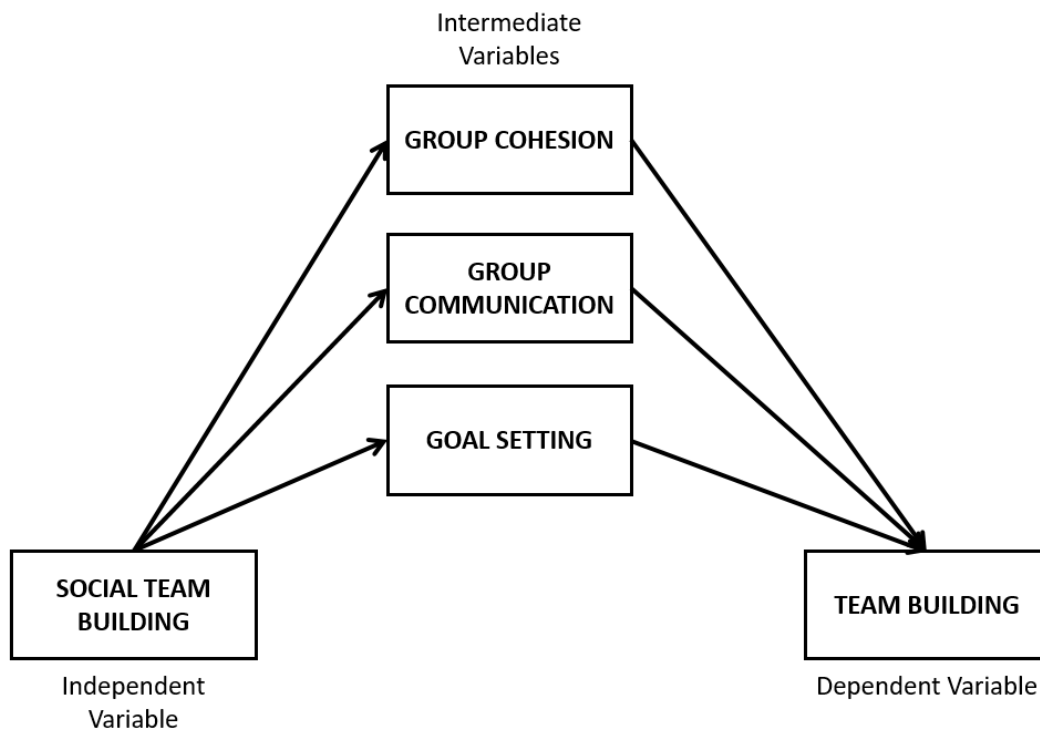
FIGURE 2-8. CONCEPTUAL MODEL

2.5   SUMMARY

This chapter began with a literature review on the definitions of teams, teamwork and the benefits of teamwork in work-teams and MBA study groups. Collaboration within the workplace have been shown to improve both *attitudinal* and *objective* performance measures. It is thus important for new graduates to have the necessary teamwork competencies. MBA study groups consist of three to six members working as collaborative learning teams. Working as part of a collaborative learning team allows the members to not only share *task-related* knowledge and skills, but the team members also develop *team-related* competencies such as conflict resolution and communication while working on the various assignments. The pitfalls of working in collaborative learning groups (eg. *social loafing*, *conflict*) were discussed and the need for team development interventions to address these pitfalls were motivated. This addressed RO_1 of the study.

Models of small group development were reviewed to understand how teams evolve. In the *forming stage*, group members are orientated more towards the task at hand. During this stage the group members are testing boundaries of both the task behaviours and interpersonal relationships, while conflict is generally avoided. Tuckman's model (1965) was expanded by Morgan, Salas and Glickman (1993) to include the cyclic nature of team development as well as the external factors that lead to the formation of a team (*pre-forming* stage). The MBA study groups are pre-allocated by the faculty staff prior to the academic programme. This often results in a diverse team. Diversity within a team have been shown to increase creativity, however it tends to increase intra-group conflict, which has been demonstrated to be detrimental to the performance of the team. This addressed RO_2 of the study.

The Input-Process-Output models of team effectiveness were reviewed to understand the critical factors that drive team effectivity and the relationships between them. In these models, individual, team and environmental factors are considered as inputs. The outputs of a team consist not only of the task performance, but also include changes that happen in the team as a result of working on a task. Team processes such as group communication and conflict resolution are considered moderating factors for the team's performance. The empirical

evidence for the link between *group cohesion* (team characteristic), *group communication* (team process) and *goal-setting* (team process) with the team's performance was reviewed.

Group cohesion refers to the tendency of a group to stick together in pursuit of goals and is considered to be an important team viability measure. Effective *group communication* has been shown to be an essential prerequisite for a team's structure, collaboration and task performance (Salas et al., 2008b) and is therefore a critical *team process* (Tannenbaum, Beard & Salas, 1992) that affects the ultimate performance of a team in multiple ways. *Goal setting* within a team will be influenced by the collective belief within the team about ability to complete a task successfully (*team-efficacy*). Thus, teams with a high level of team-efficacy will accept more challenging goals and respond more positively to set-backs, which results in higher performance, according to Goal-Setting theory (Locke, 1996). The factors considered to be important indicators for team performance were discussed in the context of the team effectivity model of Tannenbaum, Beard and Salas (1992). This addressed RO$_3$ of the study.

The second part of the chapter focussed on team development interventions (TDI), especially *social team building*. The different types of interventions were discussed. Team building interventions are designed to focus on improving various aspects of the team (goal setting, role clarification, interpersonal relationships and problem-solving). Social team building can be considered to be a combination of a *problem-solving/interpersonal relationship* team building intervention. The evidence-based benefits of team building interventions were reviewed, concerning the influence they had on *group cohesion*, *group communication* and *goal setting*. The literature shows clear empirical evidence for the improvement of *affective* outcomes as a result of a team building intervention.

Meta-analysis of the impact of team building on *objective* performance measures is still a contentious issue, where no statistical link could be found. The reviews were critical of the studies conducted to evaluate the influence of team building interventions on the performance of the team. Firstly, there were disagreements regarding the operational definitions of team building and what studies to include in the reviews. Many of the studies, had serious methodological flaws that do not allow for causal inferences to be made. Notably, earlier studies (pre-1980) consisted either of pre-experimental designs without dependent and

independent variables, no control groups or used only a post-intervention measurement to evaluate the intervention.

The reviews found that there was an over-reliance on measuring subjective/self-reported outcomes, which could be more a measure of the participant satisfaction than the actual performance. Also, many studies focussed on measuring mainly affective (team processes) outcomes, instead of objective performance measures. Furthermore, Tannenbaum, Beard and Salas (1992) stated there had been no research that examined the relationship between the stage of team's development and the usefulness of various team development interventions, which could act as a potential moderating variable. This addressed RO_4 of the study.

The chapter concluded with a conceptual model linking the social team building event as the independent variable to MBA study group formation *(team building)* as the dependent variable with *group cohesion*, *group communication and goal setting* acting as intermediate variables. This conceptual model will be the subject of an empirical study discussed in Chapter 4.

3. CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

The secondary research conducted using a literature review in Chapter Two highlighted the importance of Team Building interventions, how it relates to team performance and results in changes in the group. The importance of teamwork on the MBA programme were discussed which addressed *RQ$_1$: Why is group work important on an MBA programme?* Thus *RO$_1$: To discuss the importance of MBA group work* was achieved.

Also, *RQ$_2$: What are the stages in group development?* Which addressed *RO$_2$: To identify the stages of group development to understand the dynamics during group formation* was discussed. It was reported that groups do not progress linearly from one stage to the next, but this developmental process is rather cyclical.

Furthermore *RQ$_3$: What makes an effective MBA study group?* Which addressed *RO$_3$: To discuss the factors that make an effective MBA-group* was discussed. The Input-Process-Output models were described to conceptually understand how the different team variables could play a role in the performance of a team. The variables of *Group cohesion* (team characteristic), *Group communication* (team process) and *Goal setting* (team process) were identified as important variables for the study.

Finally, *RQ$_4$: What are the benefits of social team building events on MBA study-groups?* Which addressed *RO$_4$: To understand how social team building events can be used to promote MBA study-group formation.* Using the Input-Process-Output model the relationships between the social team building event and its possible effects on the team were developed into a conceptual model with Figure 2-8 as a result. This concluded Chapter Two.

To test if this conceptual model is practical and can assess the effect that social team building interventions have on MBA study group formation, an empirical study will be conducted. Thus, Chapter Three outlines the research approach and research design that will be used to perform this empirical research study. The research methodology that will be used to explore the literature study findings discussed in Chapter Two will be discussed. Hence, this Chapter describes the research process and data collection methods that are used in the

empirical research study. Finally, the data analysis process and the ethical requirements that need to be considered to conduct this study are reported. Therefore, Chapter Three will address *RQ₅: What research design will be used in this study?* Which corresponds to *RO₅: To establish the appropriate research design and methodology, which will be used so that the study can be replicated in future.*

The Chapter outline for Chapter Three is illustrated in Figure 3-1.

Chapter 1: Introduction and Problem Statement

Chapter 2: Literature Review

Chapter 3: Research Design and Methodology

- 3.1 Introduction
- 3.2 Research Definition
- 3.3 Research Design
- 3.4 Unit of Analysis
- 3.5 Sampling Design
- 3.6 Amazing Race as a Social Team Buidling Intervention
- 3.7 Data Collection Method
- 3.8 Research Hypotheses
- 3.9 Questionnaire Development
- 3.10 Reliability and Validity
- 3.11 Ethical Requirements
- 3.12 Summary

Chapter 4: Results and Analysis

Chapter 5: Findings, Conclusions and Recommendations

FIGURE 3-1. CHAPTER THREE OUTLINE

3.2   RESEARCH DEFINITION

Research is defined as a process of investigation and inquiry that is both methodical and systematic with the aim of increasing knowledge (Collis & Hussey, 2014, p. 2; Saunders et al., 2009). Systematic indicates that research is not based solely on beliefs, but that it is grounded in a logical relationship between theory and practice (Johnston, 2014; Saunders et al., 2009). The relationship between these two will influence the approach followed to advance knowledge (Johnston, 2014). Research can further be classified into two main categories, namely: applied research and basic research (Collis & Hussey, 2014). A study whose findings are designed to solve an existing problem and specific problem is described as applied research whereas a study whose findings are designed to influence theoretical understanding and general knowledge is classified as basic research (Collis & Hussey, 2014).

In this treatise, both above-mentioned categories will be applied. Applied research is explored to develop a specific response to the primary research problem *RP: The Business School needs to determine if the group forming interventions have an impact on MBA study group formation and team functioning.* Thus, applied research will speak directly to answering the research problem. Also, regarding basic research, this study will contribute to the body of knowledge of effective MBA study group work and evidence-based team interventions that could lead to improved team performance.

The research process (characteristics and sequence) that this study will follow is described by Saunders et al. (2009) by a metaphor of an onion. This analogy demonstrates how all the components of the research are interlinked and is illustrated in Figure 3-2. However, it is important to note that practically, research questions infrequently fall into merely one domain as the onion suggests (Saunders et al., 2009). Alternatively, Collis and Hussey (2014, p. 9) describe an overview of the research process in six steps:

- Choose a topic and explore the literature;
- Analyse the literature and design research questions;
- Outline the research and write the research proposal;
- Collect the data;
- Analyse and interpret the collected data; and
- Write the treatise or research report.
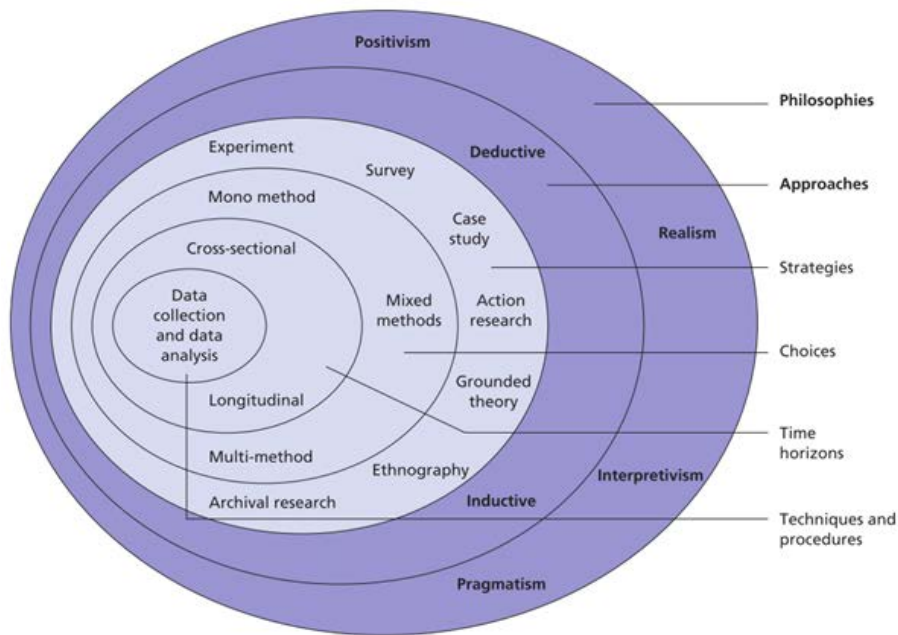
FIGURE 3-2. THE RESEARCH ONION (SAUNDERS ET AL., 2009, P. 108)

In order to ensure that good quality research is conducted, Collis and Hussey (2014, p. 18) and Litman (2012) suggest the research project to include the following aspects:

- A well-defined research question (Addressed in Chapter One);
- An explanation of existing information and the context of the problem (Addressed in Chapter Two);
- Demonstration of evidence, including data analysis that shows the study, can be replicated by other researchers (Addressed in Chapter Three and Four);
- A presentation of critical assumptions, the argument on alternative interpretations of findings and a discussion of contrary findings (Addressed in Chapter Four and Five);
- Thoughtful conclusions and the analysis of the implications of the results (Addressed in Chapter Five); and
- Sufficient references, acknowledgement of sources, an alternate perspective that enable the researcher to explore new developments on the topic and criticisms (Addressed in Chapter Two).

This sub-section defined research. The next section will discuss the various research philosophies, which were introduced in Figure 3-2 in The Research Onion.

3.3   RESEARCH DESIGN

The research design followed is determined by research philosophies (Collis & Hussey, 2014). By assessing the stance of either positivism, realism, interpretivism or pragmatism, the researcher is guided into a research methodology approach (Johnston, 2014; Saunders et al., 2009). This section explores the various research philosophies and the methodologies most commonly associated with the research philosophies.

3.3.1 RESEARCH PHILOSOPHIES AND APPROACHES

The research onion, as mentioned previously and illustrated in Figure 3-2, aids in discussing the research philosophies, the primary two being positivism and interpretivism (Collis & Hussey, 2014). Positivism relies on large samples, is usually concerned with hypothesis testing and yields precise, quantitative data that are objective, yields data high in reliability, but low in validity and allows for results of the sample to be inferred to a population (Collis & Hussey, 2014).   In contrast, interpretivist studies rely on small samples, are usually concerned with developing theories, yield rich, qualitative data that are subjective, yield findings which are high in validity, but low in reliability and allows for results of the setting to be inferred to another similar environment (Collis & Hussey, 2014).

This treatise will follow a positivistic research philosophy for which the ontology is external, objective and precise rather than intuitive and subjective as with interpretivist studies (Collis & Hussey, 2014; Saunders et al., 2009). The epistemology of positivistic research is to solely observe singularities that can deliver credible facts and data, to concentrate on causality and reduce singularities to their simplest forms (Saunders et al., 2009). The researcher's axiology in positivistic studies are unbiased and independent and as such, researchers take an objective attitude towards the data and undertake the research in a value-free manner (Saunders et al., 2009).

The teambuilding taking place during an intervention, which this study aims to investigate, is assumed to be influenced by group cohesion, group communication and goal setting which are all measurable indicators. A sample of Nelson Mandela University post-graduate business administration students will be selected and the findings of this study will be analysed (Collis & Hussey, 2014). These findings will be extrapolated to represent the population of all Nelson Mandela University post-graduate Business Administration students.

Once the philosophy has been selected, the research approach should be determined. There are two main approaches to research: deductive and inductive (Saunders et al., 2009). The deductive approach follows scientific principles where theory and hypotheses are constructed and a research strategy is designed to test the hypotheses. In contrast, an inductive approach involves collecting data, conducting data analysis and developing a theory based on the investigation. Therefore, the deductive method is most often associated with positivism and inductive approaches are most often associated with interpretivism (Saunders et al., 2009). A deductive approach is selected for this study.

3.3.2 RESEARCH METHODOLOGY

The research philosophy and approach discussed in Section 3.3.1 guides the selection of the research methodology, however, there are studies where a combination of methods can be used, which are not normally associated with the philosophy (Collis & Hussey, 2014; Park & Park, 2016). Research methodology refers to the theory behind the process of research and involves a body of methods (Collis & Hussey, 2014; Saunders et al., 2009). It includes the strategies, choices of method and time-horizons (Saunders et al., 2009).

There are three choices of methods available for researchers to choose from. These are qualitative, quantitative and mixed methods. The qualitative approach is most often indicated in exploratory or investigatory studies and uses interpretative manners to conduct analyses (Collis & Hussey, 2014; Park & Park, 2016). The following elements characterise this research method:

- To gain insights and understanding into a problem (Park & Park, 2016);
- Uncovering trends in opinions and thoughts (Park & Park, 2016);
- Collection of non-standardised data that should be categorised (Saunders et al., 2009);
- Subjective analysis and interpretation of findings, whether conscious or subconscious (Collis & Hussey, 2014);
- Associated with data analysis processes that generate non-numerical data (Saunders et al., 2009);
- The conceptualisation is used in conducting analyses (Saunders et al., 2009); and
- Allow for the findings of the study to be inferred only to another similar setting (Collis & Hussey, 2014).

Thus, qualitative data most commonly use interviews with participants or focus groups, protocol analysis, diary methods or observations (Collis & Hussey, 2014). Also, qualitative research delivers data that are associated with a high degree of validity, but a low degree of reliability (Collis & Hussey, 2014). It is essential to contextualise a problem before embarking on qualitative research as the problem can be caused by location, time, legalities, economic, social or political influences (Collis & Hussey, 2014). Qualitative data collection methods are most often associated with inductive approaches to data collection and interpretivism (Saunders et al., 2009).

In contrast to qualitative research, quantitative research is associated with objectivity and requires the researcher to be unbiased (Collis & Hussey, 2014; Saunders et al., 2009). The following characteristics are associated with quantitative research:

- Collection of the data results in standardised and numerical data (Saunders et al., 2009);
- Diagrams and statistics are used in the analysis (Saunders et al., 2009);
- Unbiased and value-free research is yielded (Park & Park, 2016);
- Structured data collection methods are used (Park & Park, 2016);
- Large sample sizes are required, which accurately represents the population of interest (Park & Park, 2016);
- Respondents are randomly selected (Park & Park, 2016);
- Findings can be extrapolated to the population (Park & Park, 2016); and
- All the variables must be established before data are collected (Collis & Hussey, 2014).

Strategies that are most often used in the quantitative data collection are surveys and experimental design (Park & Park, 2016). Experimental design is used for specific hypothesis testing and involves independent and dependent variables. It aims to comprehend the effects of a specific intervention. The survey method is another popular method used in quantitative research. The objective and purpose are to describe characteristics, which are associated with a large group to gain an understanding of the present conditions. Strategies that are most often associated with qualitative data include grounded theory, ethnography, action research, phenomenology, case study analysis and participatory enquiry. In both methods, it

is imperative to have a representative sample of the population under investigation (Park & Park, 2016).

A mixed method study uses a combination of both qualitative and quantitative research methodology. It allows for statistical analysis of quantitative data as well as in-depth insight into a problem (Park & Park, 2016; Saunders et al., 2009).

As established above, the deductive approach and quantitative research methodology are most often associated with the positivistic philosophy. The data collected are objective (Park & Park, 2016). This allows for statistical and numerical analysis and further allows the findings of the sample to be inferred onto the population (Park & Park, 2016; Collis & Hussey, 2014). Also, it established that qualitative research methodology is most often associated with subjective analysis, uncovering opinions and thoughts and helps a researcher gain insight and understanding into a problem (Park & Park, 2016). The core objective of this treatise is to evaluate the effect that social team building has on MBA-study group formation and to gain insight into what makes an effective MBA study group.

A conceptual model will be assessed and evaluated by using the deductive and quantitative research approach. The opinions of respondents about the event will be analysed by creating a word cloud of themes that respondents most often expressed and it will be analysed in aggregate. For this analysis to be achieved, an empirical study will be conducted among the 2018 intake of post-graduate Business Administration students at Nelson Mandela University. The data collected will be analysed through statistical measures. As such, a mixed method study will be conducted – the first part will be quantitative and the last question will be qualitative and ask for the opinions of respondents.

3.3.3 EXPERIMENT DESIGN AND GENERALISED CAUSAL INFERENCE

Despite its intuitive familiarity with causal relationships, a precise definition of cause and effect has eluded philosophers for centuries. Shadish, Cook and Campbell (2002, p. 2) define it as "*That which produces any simple or complex idea, we denote by the general name* **cause** *and that which is produced,* **effect**". Shadish, Cook and Campbell (2002) argue that causal relationships are not deterministic and only increase the probability that an effect will occur. Thus causal relationships are context dependent and generalisation of experimental effects must be done with care. To understand what an *effect* is, it can be viewed via the counterfactual model. The counterfactual is knowledge of what would have happened to those same people if they simultaneously did not receive treatment. An effect is the difference between that did happen and what would have happened.

A causal relationship exists if (1) the cause preceded the effect, (2) the cause was related to the effect and (3) there is no plausible alternative explanation for the effect other than the cause. It is the aim of a research design to use various methods during the experiment to reduce the plausibility of other explanations for the observed effects.

Shadish, Cook and Campbell (2002) describe the following experimental designs that are used to confirm causal relationships:

- In a *randomised experiment* the treatment is applied to experimental units, which are probabilistically similar to each other, by chance. Thus, any outcome differences that are observed between the units are likely to be due to the treatment, not to differences between the groups at the start of the study. Furthermore, if certain assumptions are met, the randomised experiment could yield an estimate of the size of a treatment effect. A *true experiment* generally refers to a study in which an independent variable is deliberately manipulated and a dependent variable is assessed.

- *Quazi-experiments* lack random assignment of units to treatment conditions but have otherwise similar purposes and structural attributes to randomised experiments. Quazi-experiments need to identify plausible alternative explanations (threats) for the causal relationship and show how likely that it can explain the treatment-outcome covariation.

Design elements may be added to the quasi-experiment to reduce the plausibility of the alternative explanations.

- *One-Group Post-test-Only* designs obtain post-test observation on respondents who experienced a treatment, but there are neither control groups nor pre-tests. This design is diagrammed as:

$$X \qquad O_1$$

where X is the treatment, O_1 is the post-test observation and the position from left to right indicates temporal order. The absence of a pretest makes it difficult to know if a change has occurred and the absence of a no-treatment control group makes it difficult to know what would have happened without the treatment. A history threat is nearly always present because other events might have occurred at the same time as the treatment to produce the observed effect.

- *One-group Pre-test-Post-test* design adds a pre-test to the preceding design. A single prior observation is taken on a group of respondents (O_1), treatment (X) then occurs and a single post-test observation on the same measure (O_2) follows:

$$O_1 \qquad X \qquad O_2$$

By adding a pre-test provides weak information about the counterfactual inference concerning what might have happened had the treatment not occurred. However, because O_1 occurs before O_2, the two may differ for a reason unrelated to the treatment, such as maturation or history.

- *Nonequivalent Group Pre-test-Post-test* design uses a treatment group and an untreated comparison group, with both pre-test and post-test data gathered on the same units. It is diagrammed:

$$NR \qquad O_1 \; X \; O_2$$
$$\text{---------------------}$$
$$NR \qquad O_1 \qquad O_2$$

The groups are nonequivalent by definition and selection bias is presumed to be present. Pre-test measurements can be used as an indication of the differences between the units, but the absence of a pre-test difference is not proof that selection bias is absent.

- *Nonexperimental designs, correlational design or passive observational design,* refer to situations in which the presumed cause and effect are identified and measured but in which other structural features of experiments are missing. Design elements such as pretests, control groups and randomisation needed to produce counterfactual inferences that are missing from the design (Shadish, Cook and Campbell, 2002, p. 18). In cross-sectional studies where all the data are collected from the respondents at once, the researcher may not even know if the cause preceded the effect. This can be problematic for causal inference unless much is known about possible alternative explanations, unless the substantive model used for statistical adjustment is well-specified.

3.3.4 TIME HORIZONS

There are two time horizons that a study can follow, cross-sectional or longitudinal, as illustrated in Figure 3-2 (Saunders et al., 2009). Cross-sectional studies are used to investigate a group of people or variables in different contexts over the same time-period (Collis & Hussey, 2014, p. 63). It is thus commonly viewed as a "snapshot" time horizon (Saunders et al., 2009). This time horizon is most often conducted when there are limited resources or time constraints. There are problems associated with the cross-sectional approach. Firstly, it determines that a correlation exists, although it does not establish why it exists (Collis & Hussey, 2014). Secondly, it is often difficult to find a sample large enough to be represented by the population and thirdly, it could be difficult to isolate the singularities under investigation from other potential influencers on the correlation (Collis & Hussey, 2014).

In contrast to cross-sectional studies, longitudinal studies are often viewed as a "diary" perspective as they accommodate changes occurring over a period (Saunders et al., 2009). Longitudinal studies investigate the same group of people or variables over a period and the repeat observations can reveal the stability of the singularity being investigated (Collis & Hussey, 2014). Longitudinal studies require a smaller sample size when compared to cross-

sectional studies. However, subjects can be lost, which can influence a problem as once started, the study must be continued (Collis & Hussey, 2014). Longitudinal studies are also costly and time-consuming (Collis & Hussey, 2014). For this study, the 2018 class intake of post-graduate students to the Business Administration programme will be samples and it will be assumed that the results can be inferred onto the population. Furthermore, a cross-sectional study will be more affordable and will be completed in the time-frame for this treatise. The research methodology selected for this study is illustrated in Figure 3-3.

Philosophy	*Approach*	*Strategy*	*Choice*	*Time Horizon*
Positivism	Deductive	Questionnaire	Mixed Method	Cross-sectional

FIGURE 3-3. RESEARCH METHODOLOGY FOR THIS TREATISE

3.4   UNIT OF ANALYSIS

The unit of analysis is closely linked to both the research problem and the research question, which was determined at the start of the study and is defined as the case under investigation about which data are collected and analysed (Collis & Hussey, 2014, p. 101). In other words, the analysis conducted in the study determines the unit of analysis. The determination of the unit of analysis allows the researcher to review whether the sample is representative of the population (Collis & Hussey, 2014). As the unit of analysis defines the boundaries in which the study is conducted (Blumberg, Cooper & Schindler, 2008), the unit of analysis for this study is the 2018 intake of the Nelson Mandela University post-graduate Business Administration students.

3.5   SAMPLING DESIGN AND PARTICIPANTS OF THE STUDY

Once the unit of analysis has been identified, the next step is to ensure that the population is accurately represented (Collis & Hussey, 2014). The ideal would be to test every person in the population. However, this is impractical due to the large population size, high costs and time frame associated with it, thus a sample from the population is selected (Saunders et al., 2009). Selecting a sample allows the researcher to draw conclusions and extrapolate the findings to the entire population (Collis & Hussey, 2014). This also allows the study to be

completed in the desired time-frame, budget and allows for easier access to respondents in the population.

To have a high response rate, the questionnaire was administered in class after the social team building event. A non-probability sampling method was used for the study as the sample members were not randomly selected and convenience sampling methods were used (Wegner, 2016). Although there are certain disadvantages to non-probability sampling such as the inability to measure sampling error and the potential of the sample to be unrepresentative of the entire population (Wegner, 2016), the benefits of lower costs and easier access outweighed the disadvantages. Each variable that was measured in the study received 168 responses.

3.6   AMAZING RACE AS A SOCIAL TEAM BUILDING INTERVENTION

The *Amazing Race* is an award-winning American reality competition show in which teams of two people race around the world (The Amazing Race - CBS.com, 2018). The race is split into several legs, with each leg requiring teams to deduce clues, navigate themselves in foreign areas, perform physical and mental challenges and vie for airplane, boat and taxi and other transportation options on a limited budget provided by the show. Teams are progressively eliminated at the end of most legs, while the first team to arrive at the end of the final leg wins the grand prize of US$1 million.

The idea of this show was used to create the social team building event, which is the subject of this study. The venue for this event was the Boardwalk Casino Complex in Summerstrand, Port Elizabeth. Teams of four to eight participants were required to move between various stations placed around the complex, by following clues placed in marked envelopes, solving puzzles at the stations and following specific directions given to them at the completion of a task. Failure to complete a task, resulted in time penalties. The first team to complete all the challenges wins the event. Figure 3-4 shows a selection of photographs taken during the Amazing Race social team building event in February 2018 at the Boardwalk Casino Complex.

FIGURE 3-4. SELECTED PHOTOGRAPHS FROM THE 2018 SOCIAL TEAM BUILDING EVENT

3.7 DATA COLLECTION METHOD

The main reason that data are collected is to investigate the research question so that knowledge can be generated (Collis & Hussey, 2014). Data can be divided into two main categories, namely primary and secondary data. Primary data are collected from sources in the form of surveys, interviews, experiments or focus groups (Collis & Hussey, 2014). In contrast, secondary data are collected from existing sources that were collected to investigate problems that researchers previously identified. These sources include internal databases or records and external sources (publications, Internet sources) (Wegner, 2016; Collis & Hussey, 2014).

The data collected for this study should align with the research questions discussed in Chapter One and should furthermore be selected based on the relevance, validity and reliability (Wegner, 2016; Collis & Hussey, 2014). The secondary data collection for this study was completed in Chapter Two. This section will thus focus on the primary data collection for the study. As discussed in Section 3.3.2, the two primary data collection methods commonly associated with positivistic studies are surveys and experimental design (Park & Park, 2016; Collis & Hussey, 2014). This study will use a questionnaire that aims to assess the DV Team Building, three IntV's (Group Cohesion, Group Communication, Goal Setting) and the IV

Social Team Building Intervention (Amazing Race) as discussed in Section 2.4. This study uses a Quazi-experimental design with no control group and only a post-test observation of self-reported perceptions of the participants of the social team building event.

3.8   RESEARCH HYPOTHESES

The conceptual model was developed in Chapter 2 and shown in Figure 2-8. This section describes the proposed hypotheses for this treatise as illustrated in Figure 3-5. The demographic variables of interest are group size and the %females in a group. To assess the formulated hypotheses, the null hypotheses shall be accepted or rejected via statistical analysis.
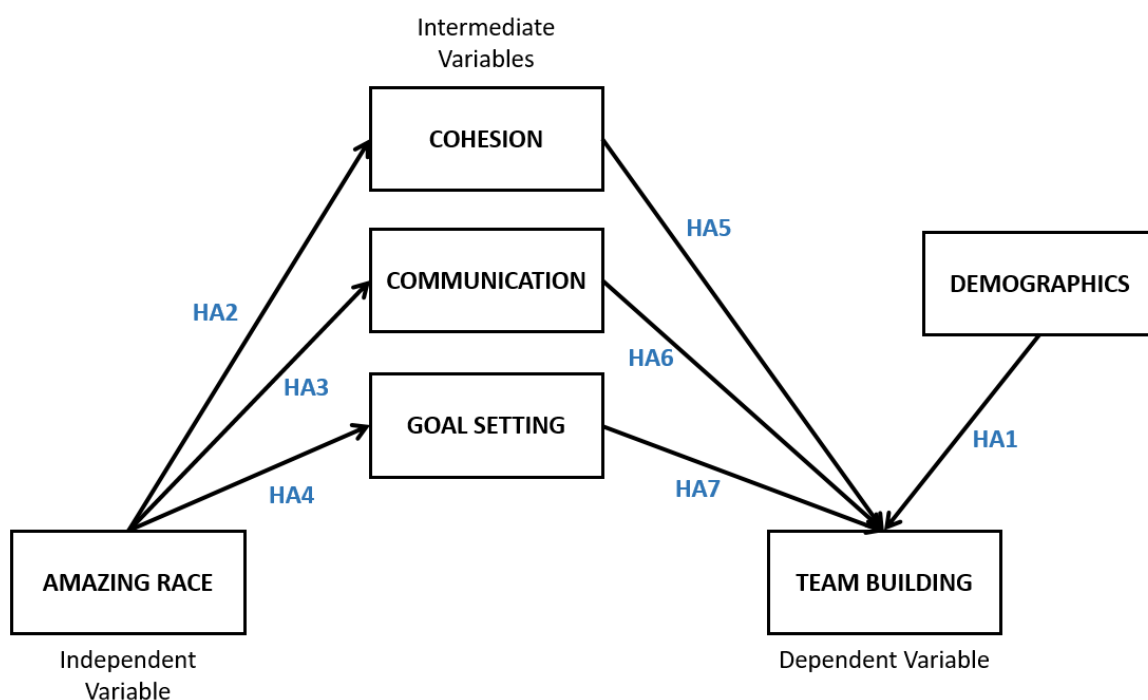
FIGURE 3-5. HYPOTHESISED THEORETICAL MODEL FOR THE EFFECT OF SOCIAL TEAM BUILDING ON TEAM FORMATION

The following is a list of hypotheses as shown in Figure 3-5.

3.8.1 DEMOGRAPHICS

Group size

$H0_{1a}$: "Group size" exerts no effect on team building.

HA_{1a}: "Group size" exerts a positive effect on team building.

%Females in group

$H0_{1b}$: "%Females in group" exerts no effect on team building.

HA_{1b}: "%Females in group" exerts a positive effect on team building.

3.8.2 AMAZING RACE

$H0_2$: "Amazing Race" exerts no effect on group cohesion.

HA_2: "Amazing Race" exerts a positive effect on group cohesion.

$H0_3$: "Amazing Race" exerts no effect on group communication.

HA_3: "Amazing Race" exerts a positive effect on group communication.

$H0_4$: "Amazing Race" exerts no effect on goal setting.

HA_4: "Amazing Race" exerts a positive effect on goal setting.

3.8.3 TEAM BUILDING

$H0_5$: "Group cohesion" exerts no effect on team building.

HA_5: "Group cohesion" exerts a positive effect on team building.

$H0_6$: "Group communication" exerts no effect on team building.

HA_6: "Group communication" exerts a positive effect on team building.

$H0_7$: "Goal setting" exerts no effect on team building.

HA_7: "Goal setting" exerts a positive effect on team building.

Each of the above hypotheses form an instrument in the questionnaire design. The following section discusses the instrument and the questions forming the instrument.

3.9 QUESTIONNAIRE DEVELOPMENT

The step of administering a questionnaire is one of the most vital steps in conducting a study, as it will determine whether respondents will respond (Saunders et al., 2009). It is therefore essential that the questionnaire is well laid out and worded in such a way that the respondent is motivated to complete the survey (Saunders et al., 2009). The wording of the questions is important as it must avoid ambiguity and be valid – in other words, measure what it says it measures and elicit reliable responses from the sample group (Collis & Hussey, 2014; Saunders et al., 2009).

The questionnaire was distributed in class after the event. The questionnaire consisted of three sections. The first section collected information about the demographics of the respondents and consisted of four items. Information such as qualification (MBA, PDBA), group number, learning centre (Port Elizabeth, East London, Durban, Cape Town, Johannesburg) and the composition (#Males, #Females) of the group was determined. The second section collected qualitative information regarding the Amazing Race event and teamwork during the event and consisted of six items. Information such as the respondent's perceptions of active teamwork, what they liked/disliked about the event and general descriptions of the event were determined.

The third section of the questionnaire was operationalised from the literature reviewed in Chapter Two and is illustrated in Table 3-1. It was made up of a five-point Likert scale with the scale "Strongly Agree" (5), "Agree" (4), "Neutral" (3), "Disagree" (2) and "Strongly Disagree" (1), which was used for team building, Amazing race, group cohesion, group communication and goal setting. Table 3-1, illustrates the operationalisation of the questionnaire. A copy of the questionnaire is attached as Annexure B: Questionnaire. This study is a follow-up from Cullen and Calitz (2015) that focussed on the relationship between the social team building intervention and group cohesion. The items for the *team building event* were expanded from only one item (A*R7: The event was worthwhile*) to the eight items listed in Table 3-1. Since the items on the questionnaire that represent the factors were not taken from established literature, this study is exploratory in nature and an essential part of the quantitative investigation would be to determine the reliability of the measurement. Issues regarding the validity of the analysis need to be taken into account when considering plausible alternative explanations for the results.

TABLE 3-1. OPERATIONALISATION OF QUESTIONNAIRE

Code	Question statement
Team Building **Dependent variable**	
TB1	1. I learned from the group
TB2	2. The group learnt from me
TB3	3. I am glad I am a member of this group
TB4	4. This group will enhance my study experience
TB5	5. The team event made me feel part of my group
TB6	6. The group worked together as a team
Amazing Race **Independent variable**	
AR1	1. I enjoyed the Amazing Race theme
AR2	2. I have seen the Amazing Race on TV
AR3	3. The Amazing Race provides a platform for group interaction
AR4	4. The Amazing Race clues were easy
AR5	5. The Amazing Race made us think and plan
AR6	6. The Amazing race made us work as a team
AR7	7. The event was worthwhile
AR8	8. The Amazing Race is a great team building exercise
AR9	9. I learned more about my team members in the Amazing Race
Group Cohesion **Intermediate variable 1**	
GCOH1	1. The group was well organised
GCOH2	2. The members encouraged each other
GCOH3	3. Group members helped each other
GCOH4	4. The group was well co-ordinated
GCOH5	5. The group is bureaucratic
GCOH6	6. Group relationships were good
GCOH7	7. The group was enthusiastic
GCOH8	8. The group worked well together
Group Communication **Intermediate variable 2**	
GCOM1	1. The group communicated well
GCOM2	2. There was one dominant group member
GCOM3	3. The group wasted a lot of time arguing
GCOM4	4. The group acted too quickly without thinking things through
GCOM5	5. The group discussed possible solutions to the clues
GCOM6	6. All members in the group debated possible solutions to the clues
Goal Setting **Intermediate variable 3**	
GS1	1. The group had a strategy
GS2	2. The group came up with good ideas
GS3	3. The group discussed their approach
GS4	4. The group was effective
GS5	5. The group was competitive
GS6	6. The group compromised with each other
GS7	7. The group focused on a specific goal

This subsection discussed the questionnaire development and distribution methods used in this study. The next sub-section discusses the data analysis methods, which will be used in the study.

3.9.1 DATA ANALYSIS

Data analysis tools are used to present collected primary data in a form that is easily interpreted and well communicated so that managers can make decisions (Wegner, 2016). Researchers make use of tools such as computer software programmes, statistical tools and other technical tools to analyse the data. It assists in summarising the findings of the sample in a simple and logical manner (Wegner, 2016; Blumberg et al., 2008).

The choice of the data analysis tools used in a study depends on whether qualitative or quantitative data collection methods are followed (Collis & Hussey, 2014). In addition, the methods selected must be valid, clear and reliable (Collis & Hussey, 2014; Blumberg et al., 2008). Precoding the questions before they are captured ensures that less mistakes are made. In addition to coding, the data needs to be captured and edited (Collis & Hussey, 2014; Blumberg et al., 2008). The coding of the questions are illustrated in Table 3.1. The capturing of the data was manually done in Microsoft Excel 2016. Once data were captured in excel, the data were edited and cleaned so that all transcription errors were removed (Saunders et al., 2009). Dr Danie Venter the Nelson Mandela University statistician did the statistical analysis for this study.

This study collected quantitative data, thus statistical data analysis methods are used to present the data. The data that were captured was analysed against the secondary data that was collected in Chapter Two thereby testing the conceptual model illustrated in Figure 2-8. Both descriptive data analysis and inferential data analysis techniques were used to analyse the data. The descriptive statistics that were conducted include frequency distributions of demographic information and the measurement items. Furthermore, central tendency and dispersion of each factor were done. For a result to be regarded as significant, it must be both statistically and practically significant. To indicate statistical significance, Alpha = 0.05 and the p-value of less than 0.05 is used. Cohen's d is used for practical significance in a One-sample T-test. The Cohen's d ranges and interpretations are illustrated in Table 3-2.

Interpretation intervals for Cohen's d:	
<0.20	Not significant
0.20 - 0.49	Small
0.50 - 0.79	Medium
0.80+	Large

Cramer's V and p-values are used to indicate practical significance in cross tabulation and Chi-square. The acceptable ranges are depicted in Table 3-3.

TABLE 3-3. INTERPRETATION INTERVALS FOR CRAMER'S V (GRAVETTER & WALLNAU, 2009, p. 268)

	Small	Medium	Large
$df^* = 1$	$.10 < V < .30$	$.30 < V < .50$	$V > .50$
$df^* = 2$	$.07 < V < .21$	$.21 < V < .35$	$V > .35$
$df^* \geq 3$	$.06 < V < .17$	$.17 < V < .29$	$V > .29$

Pearson's Product Moment Correlations analysis is conducted. The correlation coefficient is deemed statistically significant if the p-value is at 0.05 for n ranging from 150 to 200 for a correlation coefficient critical (rcrit or |r|) ranging from .103 to .106 and deemed practically significant if |r| >= .300 (Gravetter & Wallnau, 2009, p. 534). Thus, for the sample size of 168, a result will be deemed both statistically and practically significant if |r| >= .300 (Gravetter & Wallnau, 2009, p. 534).

A relationship between variables, if a correlation exists, is when one variable increases, another variable either increases (positive correlation) or decreases (negative correlation). This correlation behaves in a predictable fashion (Collis & Hussey, 2014; Leedy & Ormrod, 2010). The correlation coefficient measures the strength of such correlation. This correlation coefficient (r) can range from -1 (a perfect negative correlation) to +1 (a perfect positive correlation). The various strengths of correlation can be seen in Table 3-4.

TABLE 3-4. STRENGTHS OF CORRELATION (COLLIS & HUSSEY, 2014)

Correlation Coefficient	Interpretation
+1.00	Perfect positive linear association
+0.90 to +0.99	Very high positive correlation
+0.70 to +0.89	High positive correlation;
+0.40 to +0.69	Medium positive correlation
+0.01 to +0.39	Low positive correlation
0	No linear association
-0.01 to -0.39	Low negative correlation
-0.40 to -0.69	Medium negative correlation
-0.70 to -0.89	High negative correlation
-0.90 to -0.99	Very high negative correlation
-1.00	Perfect negative linear association

Multivariate data analysis is conducted, which will help the researcher to create knowledge and better decision making as it allows for multiple measurements to be analysed simultaneously (Hair, Black, Babin & Anderson, 2010). The multivariate methods that are used are Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA) and Structural Equation Modelling (SEM) in data analysis. EFA is used to explore the relationships among variables to identify patterns, to reduce the number of variables and to detect structure in the relationship between variables (Hair et al., 2010; Schreiber, Nora, Stage, Barlow & King, 2006). The items that provide the most significant data were kept and the items that provided redundant information were eliminated. (Hair et al., 2010). Two measurement tools help determine whether an item is significant, Eigenvalues > 1 deemed significant and minimum factor loadings of 0.432 at $\alpha = 0.05$ is deemed significant for samples n = 168 (Hair, Black, Babin anderson & Tatham, 2006, p. 128).

CFA is driven by theory or previous findings to estimate which items form the basis of each dimension of the factors and is a confirmatory technique (Schreiber et al., 2006). The purpose of it is to test the hypothesised model or determine to what degree the observed data fit the expected or hypothesised structure. On the other hand, SEM is described as an amalgamation of EFA, multiple regression and sometimes CFA (Schreiber et al., 2006; Ullman, 2001). In comparison to CFA, SEM provides the possibility of relationships amongst

latent variables and involves a measurable model and a structural model (Schreiber et al., 2006, p.325).

CFA is the measurable model and testing the reliability of observed variables is a key component of CFA (Schreiber et al., 2006). Also, the measurable model is used to investigate the degree of covariance (or lack thereof) and interrelationships between latent variables (Schreiber et al., 2006, p. 325). The process involves determining factor loadings and unique variances and estimating modification indices so that the best indicators for latent variables can be established before testing the structural model (Schreiber et al., 2006). The structural model demonstrates the interrelationships between latent and observed variables in the hypothesised model as a sequence of the structural equation – similar to running numerous regression equations (Schreiber et al., 2006).

When CFA and SEM are discussed in Chapter Four, the 'goodness-of-fit' as illustrated in Table 3-5 is used. The criteria are dependent on the number of items and the sample size, thus column 1 and column 2 in Table 3-5 are used as a reference in this study as the sample size is 168 and the number of items more than 30 (Hair et al., 2006, p. 128; Schreiber et al., 2006). The target Chi-square (χ^2) is $p > .05$ and the target χ^2 per degrees of freedom (df) or χ^2/df is ≤ 2. The target Bentler Comparative Fit Index (CFI) is $\geq .92$ and the target Bentler-Bonnet normed fit index (NFI) is $\geq .92$. The target Joreskog adjusted goodness-of-fit index (AGFI) is $\leq .95$ and finally, the target Root mean square error of approximation (RMSEA) is $\leq .08$ (Hair et al., 2006, p. 128; Schreiber et al., 2006).

SEM estimates for each model analyses the Standardised Regression Weight (SRW), Squared Multiple Correlation (SMC) and p-values. The SRW can be greater than 1,000 as it is not a correlation. The SMC is equivalent of the of R^2 for ordinary multiple linear regression, but the value can be greater than 1,000 as it is the square of multiple standardised regression weights and it applies to the DV. The p-values are not applicable to constrained parameters and are left out in these cases (Hair et al., 2006; Schreiber et al., 2006).

TABLE 3-5. "GOODNESS OF FIT" FOR STRUCTURAL EQUATION MODELLING AND CONFIRMATORY FACTOR ANALYSIS (SOURCE: COMPILED BY DR VENTER, ORIGINAL SOURCES: HAIR ET AL., 2006, P. 128; SCHREIBER ET AL., 2006)

Goodness-of-Fit Criteria depending on samples size (n) and number of items (m)						
n.m. Cat.	1	2	3	4	5	6
	n < 250			250 < n < 1000		
	m ≤ 12	12 < m < 30	m ≥ 30	m ≤ 12	12 < m < 30	m ≥ 30
χ^2	p > .05	p > .05	p > .05	p > .05	p > .05	p > .05
χ^2/df	≤ 2	≤ 2	≤ 2	≤ 3	≤ 3	≤ 3
CFI	≥ .97	≥ .95	≥ .92	≥ .95	≥ .92	≥ .90
NFI	n.a.	≥ .95	≥ .92	≥ .95	≥ .92	≥ .90
AGFI	≤ .95	≤ .95	≤ .95	≤ .95	≤ .95	≤ .95
RMSEA	≤ .08	≤ .08	≤ .08	≤ .08	≤ .08	≤ .08

Any changes that will be made to the conceptual model after analysing the data will be discussed in Chapter Four. For the qualitative data analysis, a word cloud will be constructed so that themes can be identified. These themes will allow the researcher to analyse the comments from respondents in aggregate. It will be discussed in Section 4.10.

3.10 RELIABILITY AND VALIDITY

Reliability denotes the precision and accuracy of the measurement and the absence of variation if the study was repeated (Collis & Hussey, 2014, p. 52; Saunders et al., 2009). On the other hand, validity denotes the degree to which the measurement tests what the researcher wants to test and the findings reflect the case under investigation (Collis & Hussey, 2014, p. 53; Saunders et al., 2009). Therefore, these two constructs measure the quality of the measures used in any study. In addition to validity and reliability, a researcher should also test the relevance of the measure. Thus it must complement additional measurement outcomes.

The first construct mentioned above is reliability. The researcher should question whether the findings and conclusions will stand up to scrutiny, the findings are consistent and whether, if replicated, the study would yield the same results (Collis & Hussey, 2014). In positivistic studies, reliability is considered significant; however, in interpretivist studies, it is of little significance (Collis & Hussey, 2014). However, for this study, it is important to note that little

evidence has been collected on the reliability of the measurement items. Collis and Hussey (2014, p. 274-275) explain three different ways that reliability can be estimated:

- **Test-retest reliability** – The same sample can be requested to redo the questionnaire a few days later so that the results can be compared. If there is a positive correlation between the two sets of results (correlation ≥0.8), the findings are reliable. This is a form of external reliability testing; however, it is often cumbersome for respondents and they can often change their answers after contemplating about the questions;

- **Split-half reliability** – This is a form of internal reliability for multiple-scale items and is achieved by separating the items in the scale into two equal halves. Correlation analyses are run and the correlation coefficients of the two groups are compared. The Cronbach Alpha test is considered the most applicable for split-half reliability and an advantage is that the questionnaire can be completed only once. The minimum requirement for a Cronbach's Alpha score for good reliability is 0,70 (Nunnally, 1978) and the cut-off for fair reliability is 0,60 (Zikmund, Babin, Carr & Griffin, 2013) as shown in Table 3-6.; and

- **Internal consistency reliability** – It is important to rule out multicollinearity. This means that there is a very strong correlation between variables measuring the same DV in multiple regression models (≥0.90). Multicollinearity generates unreliable approximations of standard errors. Correlation coefficients in the findings are acceptable below ≤0.70.

TABLE 3-6. INTERPRETATION OF CRONBACH'S ALPHA COEFFICIENTS (NUNNALLY, 1978; ZIKMUND, BABIN, CARR & GRIFFIN, 2013)

Cronbach's Alpha	Internal Consistency
α > 0.9	Excellent
0.7 > α > 0.9	Good
0.6 > α > 0.7	Fair
0.5 > α > 0.6	Poor
α < 0.5	Unacceptable

In addition to the reliability discussed above, the validity of the results needs to be established. As mentioned earlier, validity refers to the degree to which the measurement tool tests what the researcher wants to test and the findings reflect the case under

investigation (Collis & Hussey, 2014, p. 53; OECD, 2013; Saunders et al., 2009). There are three ways in which validity can be measured (Collis & Hussey, 2014; Saunders et al., 2009; Blumberg, et al., 2008):

- **Face validity** – also commonly referred to as content validity is described as the extent to which a measurement delivers adequate disclosure to the RQs, which guide the study (Blumberg et al., 2008). Simply put, it tests whether the measurement tool measures what it is supposed to measure (Collis & Hussey, 2014);

- **Construct validity** – pertains to hypothetical constructs, which are not directly apparent, but rather assumed. The researcher must explain in the research results and observations how the construct explains the theoretical constructs (Collis & Hussey, 2014; Saunders et al., 2009). These situations tend to consist of elements, which are deficient in empirical validation (Blumberg et al., 2008); and

- **Criterion-based validity** – often referred to as predictive validity denotes the extent to which the measurement tool adequately estimates or predicts relevant aspects of the variable or criterion (Saunders et al., 2009; Blumberg et al., 2008).

To validate the questionnaire in this study, the questions were operationalised from a previous study (Cullen & Calitz, 2015) (as illustrated in Section 3.9, Table 3-1). Also, a senior lecturer at the NMU Business School, Professor Margaret Cullen was consulted and required changes were made to the questionnaire. Therefore, face validity, criterion-based validity and construct validity were adhered to. The next section discusses ethical requirements for the study.

3.11 ETHICAL REQUIREMENTS

Research ethics form a pivotal part to any research project. It is concerned with the way in which research is collected and how the findings are conveyed (Collis & Hussey, 2014). There is a list of ethical principles that researchers should adhere to (Collis & Hussey, 2014, p. 31; Bell & Bryman, 2007):

- Avoid potential harm to participants throughout the research process;
- Respect the participant's dignity and avoid making the participant feel uncomfortable or anxious;
- Ensure that the researcher has knowledgeable consent from the participant;
- Protect the privacy of participants or avoid invading their privacy;

- Ensure the confidentiality of the collected data;

- Protect the anonymity of participants;

- Avoid deception or misleading behaviour throughout the research process;

- Declare any affiliations, conflict of interests and sponsorship of the research;

- Communicate information transparently and honestly;

- Ensure that the study does not exploit the participant, but that the investigation is mutually beneficial; and

- Avoid misrepresentation, misleading, misunderstanding or falsely reporting the findings of the investigation.

NMU has criteria stipulated which explains the requirements for full ethical clearance. Since this study involved students registered at Nelson Mandela University, this treatise meets the criteria needed for full ethical clearance. The signed ethics letter (**H18-BES-BUS-025**) from Nelson Mandela University is attached in Annexure A: Full Ethics Clearance.

3.12 SUMMARY

The main aim of Chapter Three was to describe the research design and methodology that will be used in conducting this study. Therefore, this chapter addressed *RQ5: What research design will be used in this study?* Which corresponds to *RO5: To establish the appropriate research design and methodology which will be used so that the study can be replicated in future.* To accomplish this, literature was reviewed to explore the main two research philosophies: interpretivism and positivism and the deductive and inductive approaches to research were discussed. Furthermore, this chapter reviewed the differences between qualitative and quantitative research methodologies and outlined the different data collection methods associated with each methodology. The positivistic philosophy, deductive approach, mixed method research methodology, survey data collection method and cross-sectional time horizon were chosen for this study and illustrated in Figure 3-3.

This chapter further identified the unit of analysis as Nelson Mandela University Business Administration post-graduate students and discussed the sampling design, which consisted of the 2018 student intake into the programme. The data collection methods of secondary data (conducted in Chapter Two) and primary data which will be collected through the questionnaire were discussed as well as the questionnaire development and

operationalisation of questions through literature review in Chapter Two. The data analysis methods, the validity and reliability were discussed to ensure that the data collected are valid and reliable. This chapter concluded with the ethical requirements needed to conduct this study. The next chapter will analyse the collected data and the findings will be presented and discussed.

4. CHAPTER 4: RESULTS AND ANALYSIS

4.1 INTRODUCTION

In Chapter 3, the research methodology and approach that this study followed were discussed. Chapter 3 addressed RQ_5: *What research design will be used in this study?* Which corresponds to RO_5: *To establish the appropriate research design and methodology which will be used so that the study can be replicated in future.* Also, Chapter 3 introduced the various statistical data analysis techniques that will be used in this chapter to evaluate the results of the study.

Chapter 4 addresses the RQ_M: *How effective are social team building interventions on MBA-group formation?* and RO_M: *To evaluate the effectiveness of social team building interventions on MBA study group formation.* This chapter further discusses the various aspects of the questionnaire, the demographics of the participants, followed by an analysis and discussion of the various measurement items. Exploratory Factor Analysis (EFA) and Cronbach's Alpha analysis were conducted in order to reduce the number of factors. Descriptive and inferential statistics are presented and the relationships between the DV: Team Building and selected demographic information as well as the different factors (IV, IntV and DP) are explored.

The chapter concludes with Confirmatory Factor Analysis (CFA), in order to establish the the effectiveness of the measurement instrument and finally Structural Equation Modelling (SEM) will be conducted to test the conceptual Model from Chapter 2 for its "goodness-of-fit" as a model for the effect that social team building has on MBA study group formation. The Chapter outline is illustrated in Figure 4.1.

| Chapter 1: Introduction and Problem Statement |
| Chapter 2: Literature Review |
| Chapter 3: Research Design and Methodology |
| Chapter 4: Results and Analysis |

- •4.1 Introduction
- •4.2 Demographic Profile of the Respondents
- •4.3 Measurement Items
- •4.4 Item Analysis
- •4.5 Descriptive Statistics for Factors
- •4.6 Inferential Statistics for Factors
- •4.7 Relationship between selected Demographic information and DV: Team Building
- •4.8 Relationship between Factors
- •4.9 Testing the Model
- •4.10 Qualitative Analysis of Comments from Respondents
- •4.11 Conclusions

| Chapter 5: Findings, Conclusions and Recommendations |

FIGURE 4-1. CHAPTER FOUR OUTLINE

4.2 DEMOGRAPHIC PROFILE OF THE RESPONDENTS

A total of 168 respondents (MBA and PDBA students) from the 2018 cohort of the five learning centres of the Nelson Mandela University Business School fully completed the questionnaire. The questionnaire was done in class after the social team building event resulting in a 75% (n = 168) response rate.

4.2.1 GEOGRAPHICAL INFORMATION

TABLE 4-1. FREQUENCY DISTRIBUTION – LEARNING CENTRES

Learning Centre	n	%
Cape Town	10	6%
Durban	10	6%
East London	43	25%
Gauteng	18	11%
Port Elizabeth	87	52%
Total	168	100%

Table 4-1 indicates that the majority of the respondents (78%; n = 130) came from the Eastern Cape learning centres (Port Elizabeth and East London). Figure 4-2 shows a graphical representation of the geographical distribution of the respondents.
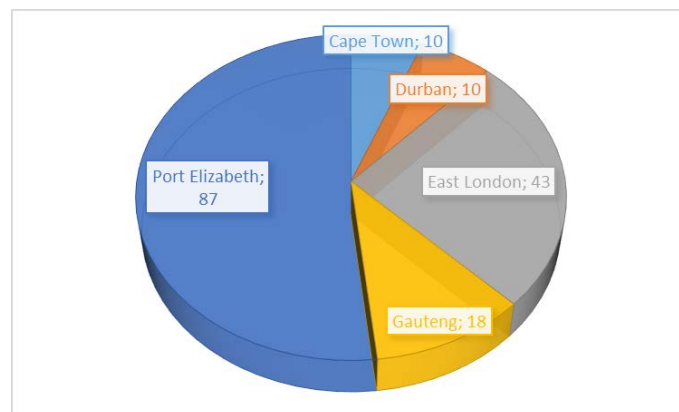
FIGURE 4-2. GEOGRAPHICAL DISTRIBUTION OF STUDENTS (N = 168)

4.2.2 DEMOGRAPHIC CHARACTERISTICS

Table 4-2 and Table 4-3 show the distribution of genders (Male and Female) in the respondent's group. The respondents reported that their groups consisted of mostly 3-5 males (69%; n = 132) and 2-4 females (90%; n = 151). It should be noted that the number of respondents should be greater or equal than either the males/females in a group. Thus the values marked in red are possibly an error from the respondents, or the other members of that group did not complete the questionnaire.

TABLE 4-2. FREQUENCY DISTRIBUTION –
MALES IN GROUP

TABLE 4-3. FREQUENCY DISTRIBUTION –
FEMALES IN GROUP

Males in Group	n	%
None	1	1%
One	3	2%
Two	13	7%
Three	48	29%
Four	48	29%
Five	36	21%
Six	17	10%
Seven	*2*	*1%*
Total	168	100%

Females in Group	n	%
None	4	2%
One	9	5%
Two	55	33%
Three	45	27%
Four	51	31%
Five	*4*	*2%*
Total	168	100%

Table 4-4 shows the distribution of the respondent's group size. The respondents reported that most of the groups (54%; n = 90) consisted of seven members. The group size was calculated from the sum of the number of males and females reported by the respondents. Reported group sizes of 9, 10 and 11 members (marked in red) each had fewer than four respondents, indicating a possible error by the respondents or the other members of those groups did not complete the questionnaire.

TABLE 4-4. FREQUENCY DISTRIBUTION – GROUP SIZE

Group Size	n	%
4	4	2%
5	12	7%
6	37	22%
7	90	54%
8	18	11%
9	*4*	*2%*
10	*2*	*1%*
11	*1*	*1%*
Total	168	100%

Table 4-5 shows the distribution of the percentage of females in the responder's group. Most of the respondent's group consisted of 40-59% females (47%; n = 81). Only one respondent reported an 80+% female group (marked in red), which is probably an error on the part of the respondent or the other members of those groups did not complete the questionnaire.

TABLE 4-5. FREQUENCY DISTRIBUTION – FEMALE % OF GROUP

Female % of Group	n	%
<20%	12	7%
20 - 39%	63	38%
40 - 59%	81	47%
60 - 79%	11	7%
80 - 100%	1	1%
Total	168	100%

4.2.3 QUALIFICATION

Table 4-6 shows the frequency distribution of the type of qualification the respondent is registered for at the Nelson Mandela University Business School. The respondents consisted of MBA (51%; n = 85) and PDBA (49%; n = 83) students.

TABLE 4-6. FREQUENCY DISTRIBUTION – QUALIFICATION

Qualification	n	%
MBA	85	51%
PDBA	83	49%
Total	168	100%

4.2.4 GROUP WORK PERCEPTIONS

Table 4-7 shows the distribution of the respondents' perceptions regarding the effectivity of the group work during the Amazing Race social team building event. The majority of respondents (94%; n = 159) reported that their group worked "*well*" or "*extremely well*" together.

TABLE 4-7. FREQUENCY DISTRIBUTION – EFFECTIVE GROUP WORK

Effective group work	n	%
Poorly	1	1%
Adequately	8	5%
Well	86	51%
Extremely well	73	43%
Total	168	100%

Table 4-8 shows the distribution of group member participation during the Amazing Race reported by the respondents. It indicates that most of the group members actively participated

during the event with only 4% (n = 7) of the respondents reporting group participation of less than 80%. The respondents' perceptions indicate that the Amazing Race was successful in making the groups actively work together during the social team building event.

TABLE 4-8. FREQUENCY DISTRIBUTION – GROUP PARTICIPATION

Group Participation	n	%
60%	7	4%
80%	39	23%
100%	122	73%
Total	168	100%

The central tendency measures: median, mean, standard deviation and dispersion for the group profile are illustrated in Table 4-9. The groups consisted of a median of seven members (four males and three females) with a standard deviation of approximately one member (male/female), corresponding to an average mean of 42.3% females in a group.

TABLE 4-9. CENTRAL TENDENCY & DISPERSION: GROUP PROFILE

Group Profile (n = 168)	Mean	S.D.	Minimum	Quartile 1	Median	Quartile 3	Maximum
Males in Group	3.93	1.26	0.00	3.00	4.00	5.00	7.00
Females in Group	2.85	1.07	0.00	2.00	3.00	4.00	5.00
Group Size	6.78	1.04	4.00	6.00	7.00	7.00	11.00
Female % of Group	42.29	16.43	0.00	28.57	42.86	57.14	100.00

4.3   MEASUREMENT ITEMS

4.3.1 DEPENDENT VARIABLE: TEAM BUILDING

This section of the questionnaire established the extent to which successful team building took place during the Amazing Race event. Descriptive statistics for the summated score derived from the responses to these items are presented and discussed in Section 4.5. Frequency distributions for these items are reported in Table 4-10.

TABLE 4-10. FREQUENCY DISTRIBUTIONS – TEAM BUILDING ITEMS

Team Building Items (n = 168)	Strongly disagree		Disagree		Not sure		Agree		Strongly agree	
I learnt from the group (**TB1**)	0	0%	1	1%	8	5%	101	60%	58	35%
The group learnt from me (**TB2**)	0	0%	3	2%	49	29%	86	51%	30	18%
I am glad I am a member of this group (**TB3**)	2	1%	1	1%	9	5%	84	50%	72	43%
This group will enhance my study experience (**TB4**)	1	1%	1	1%	20	12%	83	49%	63	38%
The team event made me feel part of my group (**TB5**)	0	0%	1	1%	6	4%	82	49%	79	47%
The group worked together as a team (**TB6**)	0	0%	0	0%	1	1%	95	57%	72	43%

The results in Table 4-10 show that 95% (n = 159) of the respondents agreed that they learned from the group (TB1). However, only 69% (n = 116) of the respondents agreed that the group learnt from them (TB2), with 29% (n = 49) not sure if the group learnt from them. The respondents had a very favourable view of working together with their group during the postgraduate study programme, with 93% (n = 156) of the respondents glad to be a member of their group (TB3) and 87% (n = 146) of respondents agreed that their group would enhance their study experience (TB4). During the team building event, 96% (n = 161) of the respondents agreed that the group made them feel part of the group (TB5) and 98% (n = 167) agreed that the group worked together as a team (TB6). This indicates that the respondents are positive regarding future group work with their assigned team on the post-graduate business management programme and experienced the group work during the Amazing Race event as a very positive experience.

4.3.2 INDEPENDENT VARIABLE: AMAZING RACE

This section of the questionnaire established the respondent's perceptions regarding the Amazing Race event. Descriptive statistics for the summated score derived from the responses to these items are presented and discussed in Section 4.5. Frequency distributions for these items are reported in Table 4-11.

TABLE 4-11. FREQUENCY DISTRIBUTIONS – AMAZING RACE ITEMS

Amazing Race Items (n = 168)	Strongly disagree		Disagree		Not sure		Agree		Strongly agree	
I enjoyed the amazing race theme (**AR1**)	0	0%	3	2%	11	7%	77	46%	77	46%
I have seen the Amazing Race on TV (**AR2**)	2	1%	10	6%	11	7%	79	47%	66	39%
The Amazing race provides a platform for group interaction (**AR3**)	0	0%	3	2%	4	2%	82	49%	79	47%
The Amazing Race clues were easy (**AR4**)	5	3%	36	21%	39	23%	71	42%	17	10%
The Amazing Race made us think and plan (**AR5**)	0	0%	4	2%	13	8%	109	65%	42	25%
The Amazing Race made us work as a team (**AR6**)	0	0%	0	0%	4	2%	100	60%	64	38%
The event was worthwhile (**AR7**)	0	0%	0	0%	8	5%	91	54%	69	41%
The Amazing Race is a great team building exercise (**AR8**)	0	0%	0	0%	12	7%	89	53%	67	40%
I learned more about my team members in the Amazing Race (**AR9**)	1	1%	0	0%	10	6%	94	56%	63	38%

The results in Table 4-11 show that 92% (n = 154) of the respondents enjoyed the Amazing Race themed event (AR1). A total of 88% (n = 145) of the responders have seen the Amazing Race on television, which indicate that they were familiar with the concept before the event. The measurement items (AR3, AR5, AR6, AR7, AR8 and AR9) all had greater than 90% (n > 151) positive responses. This indicates that the respondents felt that the Amazing Race event is a good event for team building. The only item with a large dispersion was the question whether or not the Amazing race clues were easy (AR4), 52% (n = 88) of the respondents felt that the clues were easy, while 24% (n = 41) did not think the clues were easy and 23% (n = 39) were not sure if the clues were easy. This item might have been ambiguous and could have been worded to ask whether or not the clues were "*too easy*" or "*too difficult*".

4.3.3 INTERMEDIATE VARIABLE 1: GROUP COHESION

This section of the questionnaire aimed to establish the respondents' perceptions regarding the cohesion in the group during the Amazing Race. Descriptive statistics for the summated score derived from the responses to these items are presented and discussed in Section 4.5. Frequency distributions for these items are reported in Table 4-12.

TABLE 4-12. FREQUENCY DISTRIBUTIONS – GROUP COHESION ITEMS

Group Cohesion Items (n = 168)	Strongly disagree		Disagree		Not sure		Agree		Strongly agree	
The group was well organised (GCOH1)	0	0%	5	3%	11	7%	115	68%	37	22%
The members encouraged each other (GCOH2)	0	0%	0	0%	2	1%	76	45%	90	54%
Group members helped each other (GCOH3)	0	0%	0	0%	1	1%	67	40%	100	60%
The group was well coordinated (GCOH4)	0	0%	3	2%	22	13%	93	55%	50	30%
The group was bureaucratic (GCOH5)	12	7%	41	24%	36	21%	56	33%	23	14%
Group relationships were good (GCOH6)	0	0%	0	0%	2	1%	89	53%	77	46%
The group was enthusiastic (GCOH7)	0	0%	2	1%	4	2%	73	43%	89	53%
The group worked well together (GCOH8)	0	0%	0	0%	1	1%	85	51%	82	49%

The results in Table 4-12 show that for several of the items regarding the group's organisation (GCOH1), encouragement (GCOH2), helping each other (GCOH3), coordination (GCOH4), relationships (GCOH6), enthusiasm (GCOH7) and working well together (GCOH8) had greater than 85% (n > 143) positive responses from the respondents. The only item with a large dispersion was whether or not the group was bureaucratic (GCOH5), with 47% (n = 79) of the respondents thought that the group was bureaucratic, 36% (n = 53) of the respondents saying it disagreed with the statement and 21% (n = 36) of the respondents were not sure if the group was bureaucratic. It is interesting to note that this is the only negatively worded item in this construct and it resulted in the largest dispersion of answers.

4.3.4 INTERMEDIATE VARIABLE 2: GROUP COMMUNICATION

This section of the questionnaire established the responders' perceptions regarding communication in the group during the Amazing Race event. Descriptive statistics for the summated score derived from the responses to these items are presented and discussed in Section 4.5. Frequency distributions for these items are reported in Table 4-13.

TABLE 4-13. FREQUENCY DISTRIBUTIONS – GROUP COMMUNICATION ITEMS

Group Communication Items (n = 168)	Strongly disagree		Disagree		Not sure		Agree		Strongly agree	
The group communicated well (**GCOM1**)	0	0%	1	1%	10	6%	97	58%	60	36%
There was one dominant group member (**GCOM2**)	18	11%	66	39%	36	21%	35	21%	13	8%
The group wasted a lot of time arguing (**GCOM3**)	96	57%	59	35%	2	1%	8	5%	3	2%
The group acted too quickly without thinking things through (**GCOM4**)	35	21%	88	52%	12	7%	30	18%	3	2%
The group discussed possible solutions to the clues (**GCOM5**)	2	1%	5	3%	7	4%	115	68%	39	23%
All members in the group debated possible solutions to the clues (**GCOM6**)	1	1%	13	8%	7	4%	112	67%	35	21%

The results in Table 4-13 show that the respondents reported that the group communicated well (94%; n = 157 - agreed) (GCOM1), discussed possible solutions to the clues (91%; n = 154 - agreed) (GCOM5) and that all the members took part in the discussions (88%; 147 - agreed) (GCOM6). This indicates that the different members of the group evenly distributed the communications during the Amazing Race. The respondents reported that the group did not waste time arguing with 92% (n = 155) disagreeing with the item (GCOM3). This result could be linked to the stage of group development. During the group-formation stage conflict is often avoided (Tuckman, 1965; Tuckman & Jensen, 1977). However, only 50% (n = 84) of the respondents disagreed that there was one dominant group member (GCOM5), with 29% (n = 48) agreeing that their group had one dominant member and 21% (n = 36) not sure if their group had one dominant member. The respondents felt that some groups (20%; n = 33) acted too quickly without thinking things through (GCOM4), while 73% (n = 123) of the respondents disagreed with the statement. It is again interesting to note that the negatively worded items had a larger dispersion in answers.

4.3.5 INTERMEDIATE VARIABLE 3: GOAL SETTING

This section of the questionnaire established the responders' perceptions regarding goal setting by the group during the Amazing Race event. Descriptive statistics for the summated score derived from the responses to these items are presented and discussed in Section 4.5. Frequency distributions for these items are reported in Table 4-14.

TABLE 4-14. FREQUENCY DISTRIBUTIONS – GOAL SETTING ITEMS

Goal Setting Items (n = 168)	Strongly disagree		Disagree		Not sure		Agree		Strongly agree	
The group had a strategy (**GS1**)	2	1%	31	18%	34	20%	77	46%	24	14%
The group came up with good ideas (**GS2**)	0	0%	4	2%	10	6%	110	65%	44	26%
The group discussed their approach (**GS3**)	1	1%	24	14%	26	15%	88	52%	29	17%
The group was effective (**GS4**)	1	1%	4	2%	7	4%	110	65%	46	27%
The group was competitive (**GS5**)	3	2%	10	6%	9	5%	89	53%	57	34%
The group compromised with each other (**GS6**)	11	7%	16	10%	21	13%	94	56%	26	15%
The group focused on a specific goal (**GS7**)	1	1%	10	6%	10	6%	100	60%	47	28%

The results in Table 4-14 show that only 60% (n = 101) of the respondents reported that their group had a strategy (GS1), while 19% (n = 33) said that their group did not have one and 20% (n = 34) weren't sure if their group had a strategy. The respondents indicated that the groups came up with good ideas (GS2) (91%; n = 154 - agreed), was effective (GS4) (92%; n = 156 - agreed), was competitive (GS5) (87%; n = 146 - agreed) and focussed on a specific goal (GS7) (88%; n = 147 - agreed). However, only 69% (n = 117) of the respondents reported that their group discussed their approach (GS3), with 15% (n = 25) reporting that their group did not discuss their approach and 15% (n = 25) not sure if their group discussed their approach. Seventeen percent (n = 26) of the respondents disagreed that their group compromised with each other, with 71% (n = 120) agreeing that they did and 13% (n = 21) not sure if the group compromised with each other.

4.4   ITEM ANALYSIS

As discussed in Section 3.6.2, EFA was conducted to explore the relationships among variables so that patterns could be identified, the number of variables could be reduced and structure in the relationship between variables could be detected (Hair et al., 2010; Schreiber et al., 2006). Only the items that were significantly related to the intended construct were kept. The others were eliminated (Hair et al., 2010). The three measurement tools that helped determine the significance of items were Eigenvalues, factor loadings and Cronbach's Alpha. The number of factors per construct was determined using Eigenvalues greater as 1 as the guideline (Cramer's Rule), whilst factor loadings of greater than 0.432 were deemed significant at α = 0.05 significance in accordance with the recommendation for sample sizes 150 < n < 200 (Hair et al., 2006, p. 116). Exploratory factor analysis was performed without

imposing the theoretical constructs to see if the items will group as proposed in the conceptual model.

4.4.1 EIGENVALUES

Tables 4-16 to 4-23 illustrate the Eigenvalues and the percentage that a single factor can explain each construct. In this case, principle component analysis was performed on the proposed construct items as grouped in the questionnaire to determine if it was univariate.

IV: Amazing Race

Table 4-15 shows that for *IV: Amazing Race*, two factors delivered significant Eigenvalues (3.75 and 1.01). Cumulatively these two factors explain 60% of the variance for the Amazing Race (n=168).

TABLE 4-15. EIGENVALUES AND VARIANCE EXPLAINED FOR IV: AMAZING RACE

Factor	Eigenvalue	% Variance explained	Cumulative %
1	3.75	47	47
2	1.01	13	60
3	0.88	11	71
4	0.73	9	80
5	0.61	6	87
6	0.44	5	93
7	0.32	4	97
8	0.25	3	100

In the above table the item "AR4: *The Amazing Race clues were easy*" did not load significantly (below minimum loading significance of 0.432) and were omitted. Table 4-16 shows the seven remaining items, had one factor that delivered a significant Eigenvalue of 3.75 which explains 54% of the variance in Amazing Race (n = 168).

TABLE 4-16. UPDATED EIGENVALUES AND VARIANCE EXPLAINED FOR IV: AMAZING RACE

Factor	Eigenvalue	% Variance explained	Cumulative %
1	3.75	54	54
2	0.88	13	66
3	0.74	11	77
4	0.62	9	85
5	0.44	6	92
6	0.33	5	96
7	0.25	4	100

DV: Team Building

In Table 4-17, it is illustrated that *DP: Team Building* obtained one factor that had an Eigenvalue of 3.54 and it explains 59% of the variance in Team Building (n = 168).

TABLE 4-17. EIGENVALUES AND VARIANCE EXPLAINED FOR DP: TEAM BUILDING

Factor	Eigenvalue	% Variance explained	Cumulative %
1	**3.54**	**59**	**59**
2	0.80	13	72
3	0.59	10	82
4	0.48	8	90
5	0.33	5	96
6	0.26	4	100

IntV1: Group Cohesion

Table 4-18 shows that for *IntV1: Group Cohesion*, two factors delivered significant Eigenvalues (3.82 and 1.01). Cumulatively these two factors explain 60% of the variance for the Amazing Race (n = 168).

TABLE 4-18. EIGENVALUES AND VARIANCE EXPLAINED FOR INTV1: GROUP COHESION

Factor	Eigenvalue	% Variance explained	Cumulative %
1	**3.82**	**48**	**48**
2	**1.01**	**13**	**60**
3	0.78	10	70
4	0.74	9	79
5	0.50	6	86
6	0.47	6	91
7	0.36	4	96
8	0.33	4	100

In the above table the item "GCOH5: *The group was bureaucratic*" did not load significantly (below minimum loading significance of 0.432) and were omitted. Table 4-19 shows the seven remaining items, had one factor that delivered a significant Eigenvalue of 3.79 and explains 54% of the variance in Group Cohesion (n = 168).

TABLE 4-19. UPDATED EIGENVALUES AND VARIANCE EXPLAINED FOR INTV1: GROUP COHESION

Factor	Eigenvalue	% Variance explained	Cumulative %
1	3.79	54	54
2	0.78	11	65
3	0.76	11	76
4	0.50	7	83
5	0.47	7	90
6	0.36	5	95
7	0.34	5	100

IntV2: Group Communication

In Table 4-20, it is illustrated that IntV2 Group Communication obtained two factors that have Eigenvalues of 2.42 and 1.07 and it explains 58% of the variance in Group Communication (n=168).

TABLE 4-20. EIGENVALUES AND VARIANCE EXPLAINED FOR INTV2: GROUP COMMUNICATION

Factor	Eigenvalue	% Variance explained	Cumulative %
1	2.42	40	40
2	1.07	18	58
3	0.85	14	72
4	0.72	12	84
5	0.53	9	93
6	0.41	7	100

IntV3: Goal Setting

Table 4-21 shows that for *IntV3: Goal Setting*, two factors delivered significant Eigenvalues (3.43 and 1.02). Cumulatively these two factors explain 63% of the variance for Goal Setting (n = 168).

TABLE 4-21. EIGENVALUES AND VARIANCE EXPLAINED FOR INTV3: GOAL SETTING

Factor	Eigenvalue	% Variance explained	Cumulative %
1	3.43	49	49
2	1.02	15	63
3	0.73	10	74
4	0.63	9	83
5	0.51	7	90
6	0.36	5	95
7	0.33	5	100

In the above table the item "GS6: *The group compromised with each other*" did not load significantly (below minimum loading significance of 0.432) and were omitted. Table 4-22 shows the five remaining items, had one factor that delivered a significant Eigenvalue of 3.42 and explains 57% of the variance in Goal Setting (n = 168).

Factor	Eigenvalue	% Variance explained	Cumulative %
1	3.42	57	57
2	0.75	12	69
3	0.63	10	79
4	0.51	8	88
5	0.37	6	94
6	0.33	6	100

4.4.2 CRONBACH'S ALPHA ANALYSIS

The Cronbach's alpha scores reported in Table 4-23. It is clear from Table 4-23 that all the alpha scores meet the minimum requirement of 0.70 required for good reliability (Nunnally, 1978), except IntV2: Group Communication that meets the 0.60 cut-offs for fair reliability (Zikmund et al., 2013) after the items indicated in the last column were removed to improve the reliability.

TABLE 4-23. CRONBACH ALPHA VALUES FOR THE MEASUREMENT ITEMS

Cronbach's alpha coefficients (n = 168)			
Factor	Initial	Final	Items omitted to improve reliability
Group Cohesion	0.67	0.85	The group was bureaucratic (**GCOH5**)
Group Communication	0.69	0.69	
Goal Setting	0.77	0.84	The group compromised with each other (**GS6**)
Team Building	0.85	0.85	
Amazing Race	0.77	0.85	The Amazing Race clues were easy (**AR4**)

The items that were removed to improve the Cronbach alpha coefficients are identical to the items with factor loadings below the minimum significance level.

4.4.3 FACTORS LOADINGS

In Tables 4-25 to 4-29, the factors with each factor loading are listed. A minimum factor loading of 0.432 is deemed significant at α = 0.05 significance level. Some items were omitted from a scale if either their factor loading was less than 0.432 or if their inclusion resulted in

unacceptable Cronbach's alpha values. The omitted items are depicted in strikethrough font in the tables.

TABLE 4-24. FACTOR LOADINGS – GROUP COHESION

Code	Item	Loadings
GCOH1	The group was well organised	0.68
GCOH2	The members encouraged each other	0.78
GCOH3	Group members helped each other	0.77
GCOH4	The group was well coordinated	0.77
~~GCOM5~~	~~The group was bureaucratic~~	~~0.21~~
GCOH6	Group relationships were good	0.72
GCOH7	The group was enthusiastic	0.63
GCOH8	The group worked well together	0.77

TABLE 4-25. FACTOR LOADINGS – GROUP COMMUNICATION

Code	Item	Loadings
GCOM1	The group communicated well	0.62
GCOM2	There was one dominant group member **(Reversed)**	0.57
GCOM3	The group wasted a lot of time arguing **(Reversed)**	0.62
GCOM4	The group acted too quickly without thinking things through **(Reversed)**	0.77
GCOM5	The group discussed possible solutions to the clues	0.56
GCOM6	All members of the group debated possible solutions to the clues	0.64

TABLE 4-26. FACTOR LOADINGS – GOAL SETTING

Code	Item	Loadings
GS1	The group had a strategy	0.80
GS2	The group came up with good ideas	0.80
GS3	The group discussed their approach	0.76
GS4	The group was effective	0.80
GS5	The group was competitive	0.66
~~GS6~~	~~The group compromised with each other~~	~~0.09~~
GS7	The group focused on a specific goal	0.69

TABLE 4-27. FACTOR LOADINGS – TEAM BUILDING

Code	Item	Loadings
TB1	I learnt from the group	0.74
TB2	The group learnt from me	0.60
TB3	I am glad I am a member of this group	0.77
TB4	This group will enhance my study experience	0.84
TB5	The team event made me feel part of my group	0.83
TB6	The group worked together as a team	0.80

TABLE 4-28. FACTOR LOADINGS – AMAZING RACE

Code	Items	Loadings
AR1	I enjoyed the Amazing Race theme	0.74
AR2	*I have seen the Amazing Race on TV (Not considered as an item)*	*0.46*
AR3	The Amazing race provides a platform for group interaction	0.70
AR4	*The Amazing Race clues were easy*	*0.12*
AR5	The Amazing Race made us think and plan	0.67
AR6	The Amazing Race made us work as a team	0.76
AR7	The event was worthwhile	0.82
AR8	The Amazing Race is a great team building exercise	0.80
AR9	I learned more about my team members in the Amazing Race	0.56

4.4.4 EXPLORATORY FACTOR ANALYSIS (EFA)

The measurement items were not exclusively derived from prior established literature. Thus this is an exploratory study. To determine the dimensionality of the questionnaire, without the imposed theoretical constructs, exploratory factor analysis was performed. In this section, no assumptions were made about the theoretical constructs and all the *remaining* measurement items were processed at the same time.

Exploratory factor analysis was performed using the *psych* package in R. There are three main concerns regarding the accuracy of the EFA, namely the factor extraction method, the decision on the number of factors to retain and the matrix rotation method. To determine the number of unique factors the *'fa'* function was used employing the minimum residual '*minres*' extraction method. The 'fa.*parallel'* function simulates random data and compares it with the measured data. Figure 4-3 shows the scree-plot generated after performing EFA. The analysis suggested that the measured items can be grouped in five unique factors (latent variables).

Parallel Analysis Scree Plots
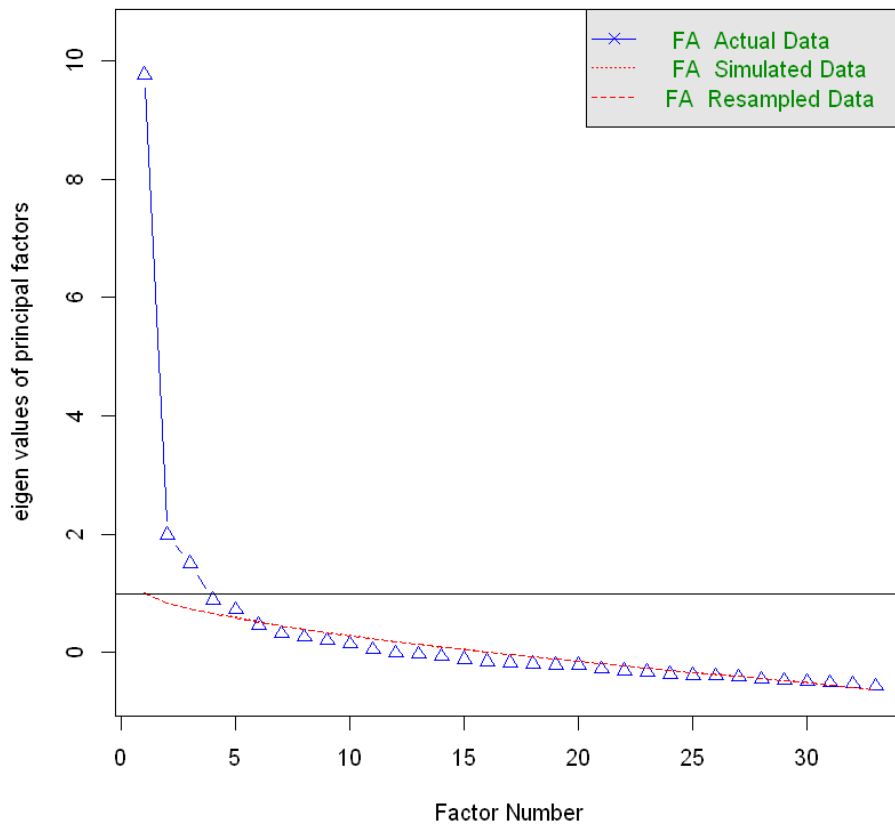
FIGURE 4-3: SCREE PLOT OF EFA ON THE MEASURED ITEMS

The factors were extracted using the '*fa*' function in the *psych* package in R. The number of factors to extract was set to five, the '*minres*' method was employed. Also, it was assumed that the extracted factors could be correlated. Thus the oblique matrix rotation method '*oblimin*' were used. Table 4-29 shows the factor loadings for the five extracted factors. The cut-off value of 0.432 was recommended for a sample size of n = 168 (Hair et al., 2006, p. 116).

The EFA shows that the first factor MR1 groups most of the Group Cohesion items together with acceptable factor loadings (>0.432), except *GCOH7: The group was enthusiastic.* This factor also included the item *GCOM1: The group communicated well* with a factor loading of 0.468. MR2 consisted of all the Goal Setting items that had acceptable factor loadings. This factor also included the item *GCOM5: The group discussed possible solutions* with a factor loading of 0.444. MR3 consisted of all the Amazing Race items, excepted *AR9: I learnt more about my team members during the Amazing Race*, which did not load with an acceptable factor loading. MR4 consisted of all the Team Building items, except *TB2: The group learnt*

from me. MR5 consisted of the negatively worded Group Communication items, which loaded with negative values, as expected. The other two Group Communication items were included in the other factors. The item *GCOM6: All members in the group debated possible solutions to the clues* did not have an acceptable factor loading.

TABLE 4-29. EFA FACTOR LOADINGS FOR A 5-FACTOR ANALYSIS (N=168, CUT-OFF=0.432)

	MR2	MR3	MR4	MR1	MR5
GCOH1				0.702	
GCOH2				0.539	
GCOH3				0.573	
GCOH4				0.741	
GCOH6				0.449	
GCOH7					
GCOH8				0.514	
GCOM1				0.468	
GCOM2					**-0.464**
GCOM3					**-0.487**
GCOM4					**-0.492**
GCOM5	0.444				
GCOM6					
GS1	0.739				
GS2	0.672				
GS3	0.717				
GS4	0.622				
GS5	0.564				
GS7	0.506				
TB1			0.476		
TB2					
TB3			0.658		
TB4			0.845		
TB5			0.686		
TB6			0.627		
AR1		0.739			
AR3		0.603			
AR5		0.496			
AR6		0.543			
AR7		0.827			
AR8		0.811			
AR9					

The diagram in Figure 4-4 shows a visual representation of the loadings obtained from the EFA. The default cut-off value was set to 0,300 to visualise all the measurement items. Note that the acceptable cut-off for this sample size (n = 168) is 0.432. The item GCOH7 did load to the Group Cohesion factor and GCOM6 loaded positively to the Group Communication factor. AR9 loaded onto the Team Building factor.

The exploratory factor analysis done without any imposed theoretical constructs showed that the proposed measurement items formed factors that are in excellent agreement with the proposed constructs, which is an indication of the validity of the instrument. It should be noted that the items on the questionnaire were not randomised and appear as grouped questions with the theoretical construct as a heading.
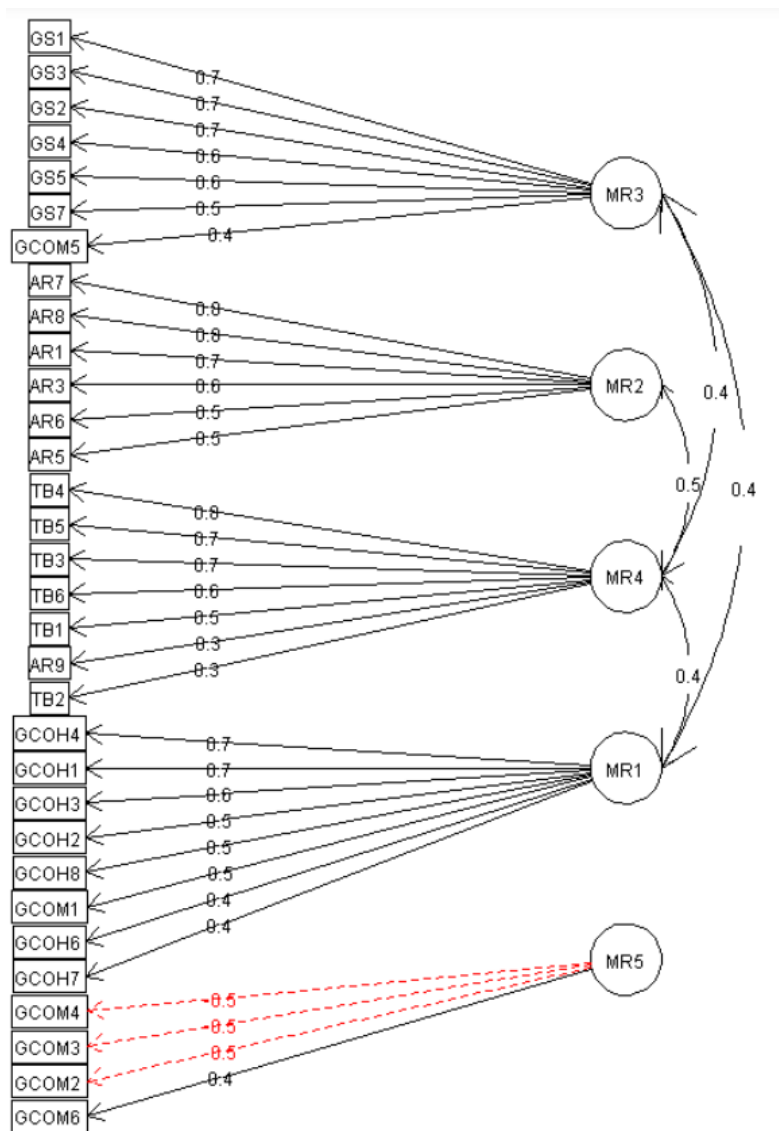
FIGURE 4-4. FACTOR LOADINGS AND FACTOR CORRELATIONS (CUT-OFF = 0.3)

4.5   DESCRIPTIVE STATISTICS FOR FACTORS

The validity (discussed in Section 3.6.3) and reliability (illustrated above) of the summated scores derived from the various factors have been established. In this section, descriptive statistics for these scores are presented.

4.5.1 FREQUENCY DISTRIBUTIONS OF FACTORS

Frequency distributions for the factors are depicted in Table 4-30. As explained in Chapter 3, the scores for the factors were categorised in accordance with the 5-point Likert scale that was used for this study into Very Negative (1.00 to 1.79), Negative (1.80 to 2.59), Neutral (2.60 to 3.40), Positive (3.41 to 4.20) and Very Positive (4.21 to 5.00).

TABLE 4-30. FREQUENCY DISTRIBUTIONS - FACTORS

Factors (n = 168)	Very Negative 1.00 to 1.79		Negative 1.80 to 2.59		Neutral 2.60 to 3.40		Positive 3.41 to 4.20		Very Positive 4.21 to 5.00	
Group Cohesion	0	0%	0	0%	1	1%	63	38%	104	62%
Group Communication	0	0%	2	1%	23	14%	93	55%	50	30%
Goal Setting	2	1%	1	1%	26	15%	94	56%	45	27%
Team Building	0	0%	0	0%	6	4%	90	54%	72	43%
Amazing Race	0	0%	0	0%	2	1%	74	44%	92	55%

As illustrated in Table 4-30, the majority of the respondents indicated positive scores (>3.40) for all the factors, especially for the *IV: Amazing Ra*ce, *DP: Team Building* and *IntV1: Group Cohesion* with more than 97% (n > 162) of the respondents reporting a "positive" or "very positive" score. The factors *IntV2: Group Communication* and *IntV3: Goal Setting* had somewhat lower "very positive" scores (27%; n = 45 and 30%; n = 50) and higher "neutral" responses (14%; n = 23 and 15%; n = 26).

4.5.2 CENTRAL TENDENCY AND DISPERSION OF FACTORS

The central tendency measures: median, mean, standard deviation and dispersion of each factor are illustrated in Table 4-31.

TABLE 4-31. CENTRAL TENDENCY & DISPERSION - FACTORS

Factors (n = 168)	Mean	S.D.	Minimum	Quartile 1	Median	Quartile 3	Maximum
Group Cohesion	4.39	0.42	3.29	4.11	4.43	4.71	5.00
Group Communication	3.96	0.55	2.33	3.67	4.00	4.33	5.00
Goal Setting	3.96	0.61	1.67	3.67	4.00	4.33	5.00
Team Building	4.26	0.49	2.67	4.00	4.17	4.67	5.00
Amazing Race	4.32	0.45	2.71	4.00	4.29	4.71	5.00

Using the same threshold values that classify those values into "very negative" (1.00 to 1.79), "negative" (1.80 to 2.59), "neutral" (2.60 to 3.40), "positive" (3.41 to 4.20) and "very positive" (4.21 to 5.00) it can be concluded that three factors *IV: Amazing Race*, *DP: Team Building* and *IntV1: Group Cohesion* obtained "very positive" mean scores, while the other two factors *IntV2: Group Communication* and *IntV3: Goal Setting* obtained "positive" mean scores.

4.6   INFERENTIAL STATISTICS FOR THE FACTORS

In this section, inferential statistics that were generated to test the various hypotheses postulated for the factors are presented.

4.6.1 ONE SAMPLE T-TESTS

One-sample t-tests were conducted to determine if the population of Amazing Race participants mean scores for the various factors can be described as negative, neutral or positive. The results of these tests are reported in Table 4-32.

TABLE 4-32. ONE-SAMPLE T-TESTS (H_1: $\mu \neq 3.40$) - FACTORS

Factors (n = 168; H_1: $\mu \neq 3.40$; d.f. = 167)							
Variable	n	Mean	S.D.	t	p	Cohen's d	Interpretation
Group Cohesion	168	4.39	0.42	30.70	<.0005	2.37	Large
Group Communication	168	3.96	0.55	13.20	<.0005	1.02	Large
Goal Setting	168	3.96	0.61	11.85	<.0005	0.91	Large
Team Building	168	4.26	0.49	22.70	<.0005	1.75	Large
Amazing Race	168	4.32	0.45	26.77	<.0005	2.07	Large

Table 4-32 shows that all the factors had a "positive" mean scores with a *large* practical significance since all the Cohen's d-values are greater than 0.80, meaning that the measurements are statically and practically significant.

4.6.2 PEARSON'S CORRELATION

As discussed in Chapter Three, a correlation coefficient with an absolute value greater than 0,300 can be regarded as significant, with correlations between 0.300 and 0.399 considered to be "*low positive*" and correlations between 0.400 and 0.699 considered to be "*medium positive*". The correlations between the factors are reflected in Table 4-33.

TABLE 4-33. PEARSON PRODUCT MOMENT CORRELATIONS – GROUP COHESION TO AMAZING RACE

Group Cohesion to Amazing Race	Cohesion	Communication	Goal Setting	Team Building	Amazing Race
Cohesion	-	*.559*	*.477*	*.575*	*.437*
Communication	*.559*	-	*.460*	*.457*	*.325*
Goal Setting	*.477*	*.460*	-	*.529*	*.402*
Team Building	*.575*	*.457*	*.529*	-	*.565*
Amazing Race	*.437*	*.325*	*.402*	*.565*	-

All the factors were positively correlated with each other ranging from low positive to medium positive. The dependant variable *DV:Team Building* was correlated medium positively with *IntV1: Group Cohesion, IntV2: Communication*, *IntV3: Goal Setting* and *IV: Amazing Race*. *IntV2: Communication* was the only factor that had a low positive correlation with *IV: Amazing Race*.

4.7   RELATIONSHIPS BETWEEN SELECTED DEMOGRAPHIC INFORMATION AND TEAM BUILDING

This section, reports the results of ANOVAs that were conducted to examine the relationships between various demographic variables and the *DV: Team Building* with the intention of making conclusions and recommendations. These statistics will be valuable when the conceptual model proposed in Chapter Two is validated.

4.7.1 GROUP SIZE

In the following analysis, the relationship between the demographic variable Group Size and Team Building were further statistically evaluated using ANOVA tests. The descriptive statistics in Table 4-34 indicated that no trend was established between the means of the respondents in the different sized groups.

TABLE 4-34. DESCRIPTIVE STATISTICS – TEAM BUILDING BY GROUP SIZE

Team Building by Group Size				
Group	All	Lower 4.00 to 5.99	Middle 6.00 to 6.99	Higher 7.00 to 11.00
n	168	16	37	115
Mean	4.26	4.16	4.36	4.24
SD	0.49	0.55	0.43	0.50
95% CI low	4.18	3.87	4.22	4.14
95% CI high	4.33	4.45	4.50	4.33

Table 4-35 shows that no statistically significant relationship (p =.282) exists between group size and Team Building.

TABLE 4-35. ANOVA – TEAM BUILDING BY GROUP SIZE

ANOVA - Team Building by Group Size					
Source of Variation	SS	df	MS	F	p-value
Between Groups	0.607	2	0.304	1.275	.282
Within Groups	39.276	165	0.238		
Total	39.883	167			

4.7.2 GENDER OF THE GROUP

In the following analysis, the relationship between the demographic variable Female % in Group and Team Building were further statistically evaluated using ANOVA tests. The descriptive statistics in Table 4-36 indicated that no trend was established between the means of the respondents in the groups with a larger percentage of females.

TABLE 4-36. DESCRIPTIVE STATISTICS – TEAM BUILDING BY FEMALE %

Table x: Descriptive statistics Team Building by Female % of Group				
Group	All	Lower 0.00 to 28.56	Middle 28.57 to 57.14	Higher 57.15 to 100.00
n	168	17	100	51
Mean	4.26	4.15	4.30	4.20
SD	0.49	0.53	0.44	0.55
95% CI low	4.18	3.87	4.21	4.05
95% CI high	4.33	4.42	4.39	4.36

Table 4-37 shows that no statistically significant relationship (p =.314) exists between Female % and Team Building.

TABLE 4-37. ANOVA – TEAM BUILDING BY FEMALE %

ANOVA - Team Building by Female % of Group					
Source of Variation	*SS*	*df*	*MS*	*F*	*p*-value
Between Groups	0.556	2	0.278	1.166	.314
Within Groups	39.327	165	0.238		
Total	39.883	167			

4.8   RELATIONSHIPS BETWEEN FACTORS

In this section, potential relationships between factors are explored. This information will aid in making recommendations to conclude this study. Descriptive statistics and Pearson's Chi-square were conducted to establish relationships.

4.8.1 RELATIONSHIP BETWEEN FACTORS

Table 4-38 illustrates that a statistically significant relationship (p<.0005) exists between Amazing Race and Group Cohesion. Respondents that had a more positive Amazing Race experience also had higher Group Cohesion. The result has medium practical significance to the study (Cramer's V = 0.34).

TABLE 4-38. CONTINGENCY TABLE – AMAZING RACE AND GROUP COHESION

Amazing Race and Group Cohesion								
	Group Cohesion							
	Lower		Middle		Higher		Total	
Amazing Race	1.00 to 4.10		4.11 to 4.71		4.72 to 5.00			
Lower 2.71 to 3.99	9	39%	14	61%	0	0%	23	100%
Middle 4.00 to 4.71	31	32%	43	44%	24	24%	98	100%
Higher 4.72 to 5.00	2	4%	15	32%	30	64%	47	100%
Total	42	25%	72	43%	54	32%	168	100%
Chi²(d.f. = 4, n = 168) = 38.59; p < .0005; V = 0.34 Medium								

Table 4-39 illustrates that a statistically significant relationship (p<.0005) exists between Amazing Race and Group Communication. Respondents who had a more positive Amazing Race experience also had better Group Communication. The result has medium practical significance to the study (Cramer's V = 0.28).

Amazing Race and Group Communication								
	Group Communication							
Amazing Race	Lower 1.00 to 3.66		Middle 3.67 to 4.33		Higher 4.34 to 5.00		Total	
Lower 2.71 to 3.99	6	26%	16	70%	1	4%	23	100%
Middle 4.00 to 4.71	39	40%	35	36%	24	24%	98	100%
Higher 4.72 to 5.00	9	19%	13	28%	25	53%	47	100%
Total	54	32%	64	38%	50	30%	168	100%
Chi²(d.f. = 4, n = 168) = 26.56; p < .0005; V = 0.28 Medium								

Table 4-40 illustrates that a statistically significant relationship (p<.0005) exists between Amazing Race and Goal Setting. Respondents who had a more positive Amazing Race experience also had better Goal Setting in the group. The result has medium practical significance to the study (Cramer's V = 0.34).

TABLE 4-40. CONTINGENCY TABLE – AMAZING RACE AND GOAL SETTING

Amazing Race and Goal Setting								
	Goal Setting							
Amazing Race	Lower 1.00 to 3.66		Middle 3.67 to 4.33		Higher 4.34 to 5.00		Total	
Lower 2.71 to 3.99	10	43%	13	57%	0	0%	23	100%
Middle 4.00 to 4.71	36	37%	45	46%	17	17%	98	100%
Higher 4.72 to 5.00	9	19%	10	21%	28	60%	47	100%
Total	55	33%	68	40%	45	27%	168	100%
Chi²(d.f. = 4, n = 168) = 38.68; p < .0005; V = 0.34 Medium								

Table 4-41 illustrates that a statistically significant relationship (p<.0005) exists between Team Building and Group Cohesion. Respondents who had a higher Group Cohesion experienced higher levels of Team Building. The result has large practical significance to the study (Cramer's V = 0.43).

Group Cohesion and Team Building								
	Team Building							
	Lower 1.00 to 3.99		Middle 4.00 to 4.67		Higher 4.68 to 5.00		Total	
Group Cohesion								
Lower 3.29 to 4.10	16	39%	24	59%	1	2%	41	100%
Middle 4.11 to 4.71	14	19%	53	74%	5	7%	72	100%
Higher 4.72 to 5.00	7	13%	17	31%	30	56%	54	100%
Total	37	22%	94	56%	36	22%	167	100%
Chi²(d.f. = 4, n = 167) = 60.38; p < .0005; V = 0.43 Large								

Table 4-42 illustrates that a statistically significant relationship (p<.0005) exists between Team Building and Group Communication. Respondents who had a better Group Communication experienced higher levels of Team Building. The result has medium practical significance to the study (Cramer's V = 0.29).

TABLE 4-42. CONTINGENCY TABLE – GROUP COMMUNICATION AND TEAM BUILDING

Group Communication and Team Building								
	Team Building							
	Lower 1.00 to 3.99		Middle 4.00 to 4.67		Higher 4.68 to 5.00		Total	
Group Communication								
Lower 2.33 to 3.66	17	31%	33	61%	4	7%	54	100%
Middle 3.67 to 4.33	16	25%	39	61%	9	14%	64	100%
Higher 4.34 to 5.00	5	10%	22	44%	23	46%	50	100%
Total	38	23%	94	56%	36	21%	168	100%
Chi²(d.f. = 4, n = 168) = 28.04; p < .0005; V = 0.29 Medium								

Table 4-43 illustrates that a statistically significant relationship (p<.0005) exists between Team Building and Goal Setting. Respondents who had a better Goal Setting experienced higher levels of Team Building. The result has large practical significance to the study (Cramer's V = 0.41).

TABLE 4-43. CONTINGENCY TABLE – GOAL SETTING AND TEAM BUILDING

Goal Setting and Team Building								
	Team Building							
	Lower 1.00 to 3.99		Middle 4.00 to 4.67		Higher 4.68 to 5.00		Total	
Goal Setting								
Lower 1.67 to 3.66	17	32%	32	60%	4	8%	53	100%
Middle 3.67 to 4.33	18	26%	45	66%	5	7%	68	100%
Higher 4.34 to 5.00	1	2%	17	38%	27	60%	45	100%
Total	36	22%	94	57%	36	22%	166	100%
Chi²(d.f. = 4, n = 166) = 57.05; p < .0005; V = 0.41 Large								

4.9 TESTING THE MODEL

The models were tested using CFA and SEM.

4.9.1 CONFIRMATORY FACTOR ANALYSIS

CFA was conducted to investigate the measurement instruments used to measure the DV, IV and IntVs. Table 4-44 depicts the results for both the DV, IV and IntVs. For the DV, p-value (0.292), χ^2/df (1.23), CFI (1.00), NFI (0.99), AGFI (0.95) and RMSEA (0.037) all fall within the required ranges. For the IV, the p-value (0.892), χ^2/df (0.52), CFI (1.00), NFI (0.99), AGFI (0.97) and RMSEA (0.000) all fell within the required ranges. For the IntVs, p-value (0.254), χ^2/df (1.08), CFI (0.99) and RMSEA (0.022) fall within the required ranges. However the NFI (0.91) and AGFI (0.88) fall outside the required ranges.

Therefore, the CFA results for the DV: *Team Building* and IV: *Amazing Race* confirms that the measurement instrument is in order. For the IntV's the NFI and AGFI did not fall within the required ranges. This is probably due to the fact that the measurement items where not operationalised from literature, thus the validity still need to be proven. Therefore, further research is required to improve the instrument's fit.

Observed CFA Fit Statistics								
Indices for Single Models			CFA Amazing Race		CFA Intermediate Variables		CFA Team Building	
Sample size (n)			168		168		168	
No. of items (m)			8		21		6	
Sample size (n); No. of items (m) Category			n < 250; m ≤ 12		n < 250; 12 < m < 30		n < 250; m ≤ 12	
Absolute/predictive fit	Abbr.	Target	Observed	Target	Observed	Target	Observed	
Chi-square (Maximum likelihood)	χ^2		5.70		133.00		6.15	
	df		11		123		5	
	χ^2 p	≥ .05	.892	≥ .05	.254	≥ .05	.292	
	χ^2/df	≤ 2	0.52	≤ 2	1.08	≤ 2	1.23	
Comparative Fit Indices								
Bentler-Bonnet normed fit index	NFI	n.a.	.99	≥ .95	.91	n.a.	.99	
Bentler comparative fit index	CFI	≥ .97	1.00	≥ .95	.99	≥ .97	1.00	
Other								
Joreskog adjusted GFI	AGFI	≥ .95	.97	≥ .95	.88	≥ .95	.95	
	95%Lo		.000		.000		.000	
Root mean square error of approximation	RMSEA	≤ .08	.000	≤ .08	.022	≤ .08	.037	
	95%Hi		.037		.045		.119	

4.9.2 STRUCTURAL EQUATION MODELLING

The same 'goodness-of-fit' guidelines that were used in the previous section to discuss the goodness of fit for the CFA are used in this section to discuss the SEM results for the various models that were tested. Table 4-45 depicts the SEM fit statistics for the three models depicted in Figure 4-5 to Figure 4-7. These will be discussed under each model in this section. Also, SEM estimates for the relevant model parameters are also reported, Standardised Regression Weight (SRW), Squared Multiple Correlation (SMC) and p-values are reported and discussed.

Observed CFA Fit Statistics								
Indices for Single Models								
		SEM 1 AR-GCoh;GCom;GS-TB		SEM 2 AR-GCoh;GCom;GS-TB AR-TB		SEM 3 AR-GCoh;GCom;GS AR-TB		
Sample size (n)		168		168		168		
No. of items (m)		33		33		33		
Sample size (n); No. of items (m) Category		n < 250; m ≥ 30		n < 250; m ≥ 30		n < 250; m ≥ 30		
Absolute/predictive fit	Abbr.	Target	Observed	Target	Observed	Target	Observed	
Chi-square (Maximum likelihood)	χ^2		667.61		633.34		620.54	
	df		453		450		452	
	χ^2 p	≥ .05	< .0005	≥ .05	< .0005	≥ .05	< .0005	
	χ^2/df	≤ 2	1.47	≤ 2	1.41	≤ 2	1.37	
Comparative Fit Indices								
Bentler-Bonnet normed fit index	NFI	≥ .92	.78	≥ .92	.79	≥ .92	.79	
Bentler comparative fit index	CFI	≥ .92	.91	≥ .92	.93	≥ .92	.93	
Other								
Joreskog adjusted GFI	AGFI	≥ .95	.77	≥ .95	.78	≥ .95	.79	
	95%Lo		.044		.040		.038	
Root mean square error of approximation	RMSEA	≤ .08	.053	≤ .08	.049	≤ .08	.047	
	95%Hi		.062		.058		.056	
Note: **Red** indicates acceptable fit for Single Models (shaded cells)								
Indices for Comparison of Multiple Models								
Absolute/predictive fit								
Akaike Information Criterion (AIC)		< better	883.605	< better	855.339	< better	838.537	
Browne-Cudeck Criterion (BCC)		< better	938.823	< better	912.090	< better	894.267	

4.9.2.1   MODEL 1

The conceptual model from Chapter Two is illustrated in Figure 4.7. In Model 1 the Amazing Race was treated as the independent variable that leads to the intermediate variables (Group Cohesion, Group Communication and Goal Setting), which leads to the dependant variable Team Building.
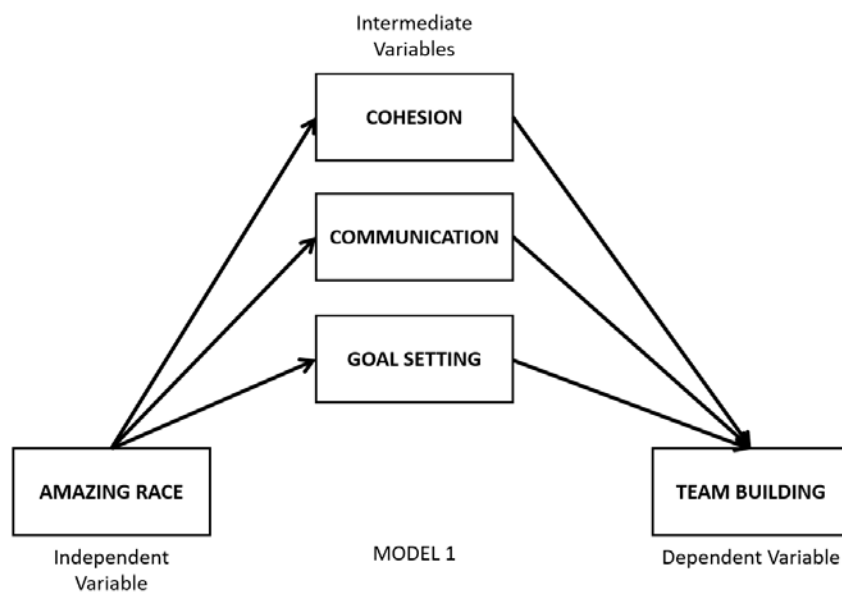

FIGURE 4-5. MODEL 1 (*PREVIOUSLY ILLUSTRATED AS CONCEPTUAL MODEL FIGURE 2-8*)

The "goodness-of-fit" results for Model 1, illustrated in Table 4-45, indicate that the χ^2/df (1.47) and RMSEA (0.053) were within the required ranges. However, the p-value (< 0.005), NFI (0.78), AGFI (0.77) and CFI (0.91) did not fall into the acceptable ranges. Only the relationships between the IV: *Amazing Race* and the intermediate variables were of significance. None of the relationships between the intermediate variables and the dependent variable was of significance as shown in Table 4-46. Therefore, Model 1 is not a feasible model.

TABLE 4-46. SEM ESTIMATES FOR MODEL 1

Relationship	SRW	p-value	SMC
Amazing Race--->Group Cohesion	0.791	<.0005	0.626
Amazing Race--->Group Communication	0.987	<.0005	0.974
Amazing Race--->Goal Setting	0.761	<.0005	0.579
Group Cohesion--->Team Building	-0.100	.481	0.840
Group Communication--->Team Building	1.048	.532	0.840
Goal Setting--->Team Building	-0.075	.550	0.840

4.9.2.2 MODEL 2

Model 2, illustrated in Figure 4-6, was statistically constructed as Model 1 was not a feasible model. This model is identical to Model 1, except that a direct relationship between the IV: *Amazing Race* and the DP: *Team Building* was inserted.
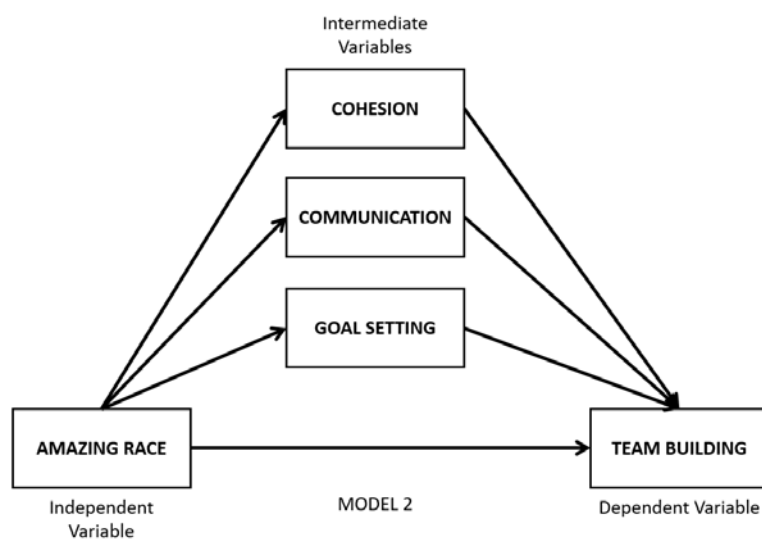

FIGURE 4-6. MODEL 2

The "goodness-of-fit" results for Model 2, illustrated in Table 4-45, indicate that the χ²/df (1.41), CFI (0.93) and RMSEA (0.049) were within the required ranges. However, the p-value (<0.005), NFI (0.79), AGFI (0.78) and did not fall into the acceptable ranges. Only the relationships between the IV: *Amazing Race* and the intermediate variables were of significance. None of the relationships between the intermediate variables and the dependent variable was of significance as shown in Table 4-47. Therefore, Model 2 is not a feasible model.

TABLE 4-47. SEM ESTIMATES FOR MODEL 2

Relationship	SRW	p-value	SMC
Amazing Race--->Group Cohesion	0.807	<.0005	0.652
Amazing Race--->Group Communication	0.973	<.0005	0.946
Amazing Race--->Goal Setting	0.777	<.0005	0.604
Amazing Race--->Team Building	1.350	.399	0.870
Group Cohesion--->Team Building	-0.175	.305	0.870
Group Communication--->Team Building	-0.173	.907	0.870
Goal Setting--->Team Building	-0.153	.295	0.870

4.9.2.3   MODEL 3

Model 3 illustrated in Table 4-48, was statistically constructed because Model 2 was not a feasible model. This model has relationships between the IV: *Amazing Race* and the intermediate variables. It also has a direct relationship between the independent variable and the DP: *Team Building*.
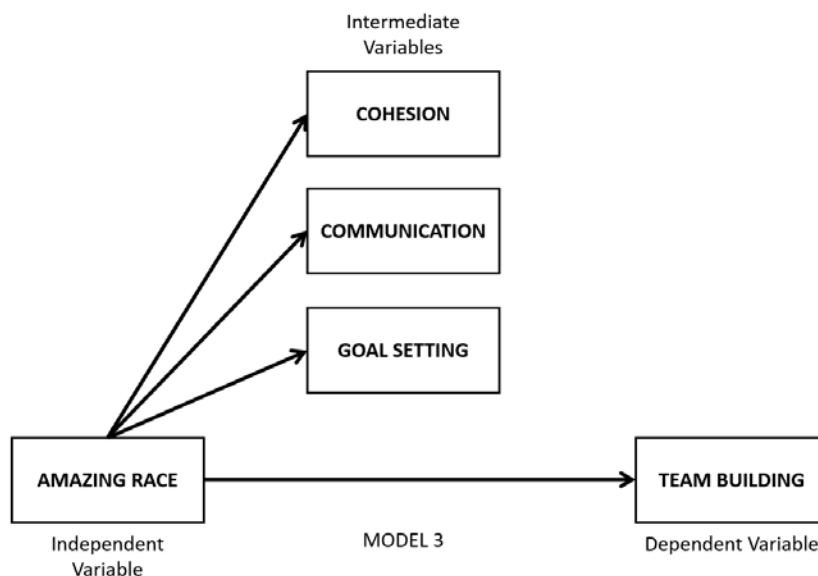

FIGURE 4-7. MODEL 3

The "goodness-of-fit" results for Model 3, illustrated in Table 4-45, indicate that the χ²/df (1.37), CFI (0.93) and RMSEA (0.047) were within the required ranges. However, the p-value (<0.005), NFI (0.79), AGFI (0.79) and did not fall into the acceptable ranges. The relationships between the IV: *Amazing Race*, the intermediate variables and DP: *Team Building* were of significance as shown in Table 4-48. This is considered an improved model, because all the relationships are of significance, however the fitting indexes did not fall within the required ranges and therefore this is not yet an accepted model.

TABLE 4-48. SEM ESTIMATES FOR MODEL 3

Relationship	SRW	p-value	SMC
Amazing Race--->Group Cohesion	0.789	<.0005	0.623
Amazing Race--->Group Communication	0.976	<.0005	0.954
Amazing Race--->Goal Setting	0.758	<.0005	0.575
Amazing Race--->Team Building	0.890	<.0005	0.792

4.10 QUALITATIVE ANALYSIS OF COMMENTS FROM RESPONDENTS

Figure 4-8 depicts the most prominent themes that came from the respondents' comments, where they were asked to describe the Amazing Race event in three words.

FIGURE 4-8. WORDCLOUD GENERATED FROM THE RESPONDENT DESCRIPTIONS OF THE EVENT

The overwhelming majority reported positive responses to the event, although some concerns regarding the time length of the event, organisation and the level of physical exertion required were mentioned.

4.11 CONCLUSIONS

The primary aim of Chapter Four was to address the RQ_M: *How effective are social team building interventions on MBA-group formation?* And RO_M: *To evaluate the effectiveness of social team building interventions on MBA study group formation.* To achieve this, the results of the primary research study were analysed and discussed. One hundred and sixty-eight respondents participated in the study. Exploratory Factor Analysis, descriptive statistics and various inferential statistics were conducted and the result of the factors was deemed acceptable with all of the Cronbach's Alpha scores measuring above 0.69. Principle component analyses were performed on variables to show that the results of each variable can be explained by one factor only. The construct validity was then further investigated using Exploratory Factor Analysis without imposing any theoretical constructs. The questionnaire item loadings where in excellent agreement with the proposed theoretical factors.

The DV: *Team building,* which is the measurement for the degree to which group formation took place had a 97% (n = 162) positive rating. This indicates that the overwhelming majority of the participants have positive attitudes regarding the capability (*team efficacy*) of their allocated group for the post-graduate study programme. The perceptions of IV: *Amazing Race* event had a 99% (n = 166) positive rating. This indicates that the overwhelming majority of the participants agree that the event was worthwhile and contributed positively towards group formation.

The intermediate variable IntV1: *Group cohesion* during the event had a 99% (n = 167) positive rating. In addition, 94% (n = 159) of the participants agreed that their group worked effectively during the Amazing Race event. The other intermediate variables IntV2: *Group Communication* (85%; n = 143) and IntV3: *Goal-Setting* (83%; n = 139) had lower "positive" ratings, which can be attributed towards the stage of group development and the fact that tasks given during the Amazing Race event involved non-work related skills and knowledge.

The descriptive statistical measures confirm that the participants had a positive experience during the event and they have a positive perception regarding their allocated group.

Statistical relationships between the independent variables, intermediate variables and the dependent variable were explored through Pearson's correlation analysis. The variables were all positively correlated with correlations coefficients ranging from 0.325 (low positive) to 0.565 (medium positive) in strength. Furthermore, relationships between selected demographic information and the dependent variable were examined using ANOVA. No statistical meaningful relationship could be found between the demographic information and the DP: *Team Building* (H1).

The relationships between the independent variable, intermediate variables and dependent variable were explored through Chi-square tests, descriptive data analysis methods and t-Tests. The t-tests confirmed that all the mean scores for the various factors can be described as "positive" with a large practical significance, since the Cohen's d-values were all above 0.8. The Chi-square analysis confirmed statistical significant relationships exists for all the other hypotheses proposed (H2-H7) in Section 3.8.

The measurement instrument for the Dependent Variable and Independent Variable was reviewed and deemed fit using Confirmatory Factor Analysis, although room for improvement was identified for the measurement instrument of the Intermediate Variables. Finally, Structural Equation Modelling was conducted to determine whether the conceptual model from Chapter Two was fit. However, it was found that the relationships between the Intermediate Variables and the Dependent Variable were not of significance and a new improved model (Model 3) for the effect of Amazing Race was proposed (Figure 4-9).
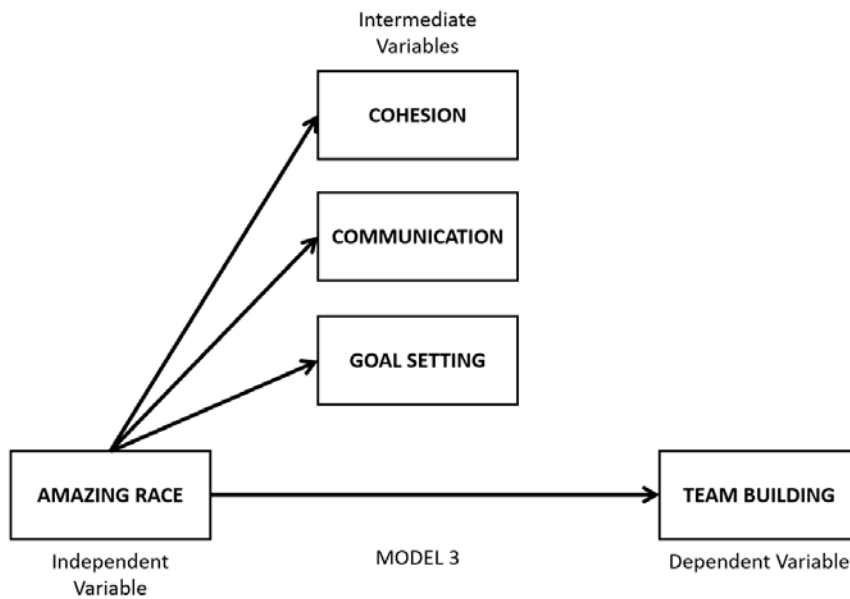
FIGURE 4-9. MODEL 3 (*PREVIOUSLY ILLUSTRATED AS FIGURE 4-7*)

The first five research questions and research objectives have been addressed in the first four chapters. In Chapter Five, a conclusion to the study will be made and *RQ$_6$: What recommendations can be made for the design of systematic social team building interventions for an MBA* programme? Which correlates to *RO6: To formulate the guidelines for the systematic design of social team building interventions for new MBA groups* will be addressed. Chapter 5 further addresses the *RQ$_M$: How effective are social team building interventions on MBA-group formation? Which will address RO$_M$: To evaluate the effectiveness of social team building interventions on MBA study group formation*.

5. CHAPTER 5: FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

In Chapter 4, the results of the empirical study were presented, analysed and discussed. The chapter concluded with a conceptual model for measuring the effectiveness of social team building interventions on MBA study group formation. The chapter further addressed RQ_M: *How effective are social team building interventions on MBA study group formation?* This corresponds with RO_M – *To evaluate the effectiveness of social team building interventions on MBA group formation.*

This chapter serves as the final chapter of the study and presents the findings, managerial recommendations and conclusions to this study. *RQ_6: What recommendations can be made for the design of systematic social team building interventions for an MBA programme?* This corresponds to *RO_6: To formulate the guidelines for the systematic design of social team building interventions for MBA study groups* is addressed.

The Chapter outline is illustrated in Figure 5.1.

Chapter 1: Introduction and Problem Statement

Chapter 2: Literature Review

Chapter 3: Research Design and Methodology

Chapter 4: Results and Analysis

Chapter 5: Findings, Conclusions and Recommendations

- •5.1 Introduction
- •5.2 Summary of Treatise
- •5.3 Key Findings of the Study
- •5.4 The Tested Model for the Evaluation of Social Team Building Interventions
- •5.4 Managerial Recommendations for the Design of Social Team Building Interventions
- •5.5 Limitations and Call for Future Research
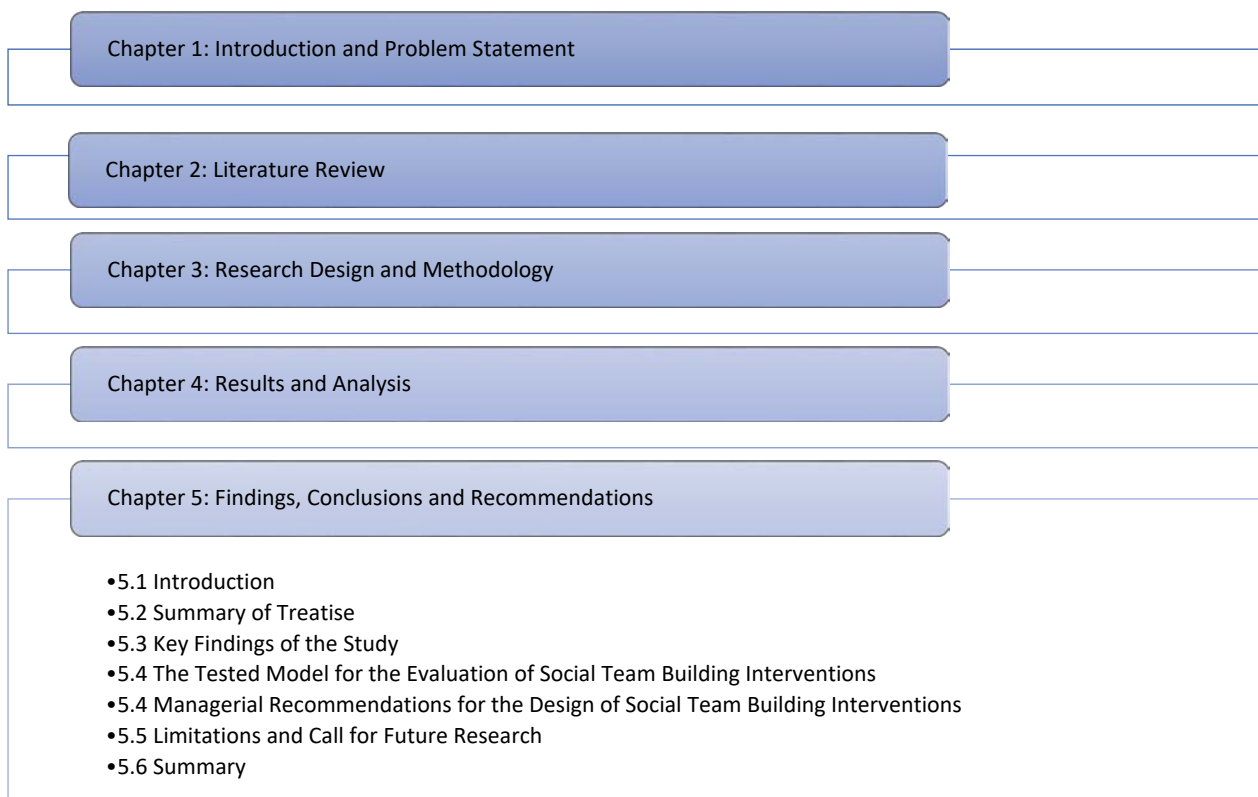- •5.6 Summary

FIGURE 5-1. CHAPTER FIVE OUTLINE

5.2 SUMMARY OF STUDY

5.2.1 CHAPTER 1: INTRODUCTION AND PROBLEM STATEMENT

Chapter 1 introduced the treatise, provided an overview of the study, its purpose and the research significance and delimitation. It further outlined the problem statement: *The Nelson Mandela Business School needs to determine if their social team building interventions have an impact on MBA study group formation.* Additionally, it defined the RQ_M: *How effective are social team building interventions on MBA study group formation? W*hich corresponded to the RO_M: *To evaluate the effectiveness of social team building interventions on MBA study group formation?* The chapter concluded with the Research Alignment Plan, which guided the researcher throughout the treatise.

5.2.2 CHAPTER 2: LITERATURE REVIEW

Chapter 2 explored and analysed the various academic resources such as journal articles, books and dissertations to address the first four secondary research questions. These were: RQ_1: *Why is group work important on an MBA programme?* Teamwork competencies were identified as a critical workplace skill that needs to be developed during the post-graduate programme. Working in collaborative learning groups on the study programme will help to build these necessary teamwork competencies. In addition, it allows the group members to share each other's knowledge and skills that's needed for the various assignments on the study programme. This addressed RO_1: *To discuss the importance of MBA group work.*

Additionally, RQ_2: *What are the stages in group development?* The progression of small groups according to Tuckman's (1965) model (Forming-Storming-Norming-Performing-Adjourning) were discussed. However, two additional considerations regarding the *cyclic* nature of team development as well as the *environmental* influences were included by the TEAM model of Morgan, Salas and Glickman (1993). The study groups were pre-allocated at the start of the study programme and often consists of a diverse study group with respect to academic readiness, motivations for enrolling into the programme, culture and expectations about the programme. These factors could influence the group during the formation stage. This addressed RO_2: *To identify the stages of group development to understand the dynamics during group formation.*

Furthermore *RQ$_3$: What makes an effective MBA study group?* The performance of the team can be understood within the Input-Process-Output model. Inputs into this model include task characteristics, team characteristics and individual characteristics. The outputs of the team not only include objective performance measures, but also changes that occur in the team as a result of working together. In the IPO model, the outputs are moderated through team processes. In this study, *Group Cohesion* (team characteristic), *Group Communication* (team process) and *Goal Setting* (team process) are considered as important team viability measures for an effective team. The empirical evidence for the link between each team viability measure and performance were summarised. This addressed *RO$_3$: To discuss the factors that make an effective MBA study group.*

Finally, *RQ$_4$: What are the benefits of social team building events in MBA study groups?* Team Development Interventions aim to improve teamwork and taskwork competencies in teams. *Team building* is a collection of formal and informal team-level interventions that focus on improving social relations and clarifying roles, as well as solving the task and interpersonal problems that affect team functioning. *Social Team Building* is considered a problem-solving / interpersonal relationship team building intervention, with the aim to improve interpersonal relationships and by identifying team efficiencies upon reflection after the event.

The empirical evidence for the influence of team building interventions on the three team viability measures (*Group Communication, Group Cohesion, Goal-Setting*) were discussed. *Team-efficacy* was identified as a critical viability measure according to Goal-Setting theory. During the formation stage it is vital that the group develop a belief that it will be capable to succeed on the study programme. The role of social team building interventions would be to build postive first interactions during the orientation programme in a non-work related setting. This addressed *RO$_4$: To understand how social team building events can be used to promote MBA study group formation.*

Chapter 2 concluded with a proposed conceptual model that formed the foundation of the questionnaire developed for the empirical study.

5.2.3 CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

Chapter 3 outlined the various research philosophies and approaches and discussed the research methodology used in this study, namely the Philosophy: *Positivistic*, Approach: *Deductive*, Strategy: *Questionnaire*, Choice: *Mixed method* and Time Horizon: *Cross-sectional*. Additionally, Chapter 3 discussed the operationalisation of the questionnaire from literature. The reliability and validity of the questionnaire used in the study were discussed. It also determined the data analysis tests and required ranges which were used to analyse the data collected in Chapter 4. As such, this chapter addressed *RQ$_5$: What research design will be used in this study?* This corresponded to *RO$_5$: To establish the appropriate research design and methodology which will be used so that the study can be replicated in future.*

5.2.4 CHAPTER 4: RESULTS AND ANALYSIS

Chapter 4 presented, discussed and analysed the data from the post-test questionnaire from 2018 intake of post-graduate students from the Nelson Mandela University Business School after the Amazing Race social team building event. Descriptive and inferential statistics, Exploratory Factor Analysis, Confirmatory Factor Analysis and Structural Equation Modelling were conducted. Also, various relationships between selected variables and demographic information were explored. The conceptual model from Chapter 2 was tested and Chapter 4 concluded with a tested model for measuring the DV: *Team Building*.

Therefore, Chapter 4 addressed *RQ$_M$: How effective are social team building interventions on MBA study group formation?* The overwhelming majority (>97%; n = 162) of the participants reported positively on the *IV: Amazing Race* event and DP: *Team Building* experienced as a result of the event. The results of the study and the proposed hypotheses are discussed as the key findings of the study below. This matches *RO$_M$: To evaluate the effectiveness of social team building interventions on MBA group formation?*

5.2.5 CHAPTER 5: FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

Chapter 5 serves as a summary of the entire study, presents the key findings from the literature and the empirical study and addresses any gap between the literature and the results. Also, the implications of the study and managerial recommendations are discussed and limitations to the study and call for future research are made. Finally, conclusions are made based on the research findings. Therefore, the *RQ$_6$: What recommendations can be*

made for the design of systematic social team building interventions for an MBA programme? Which corresponded to *RO₆: To formulate the guidelines for the systematic design of social team building interventions for MBA study groups was* addressed.

5.3 KEY FINDINGS OF THE STUDY

This section summarises the key findings of the study for each variable and finally discusses the conceptual model for measuring the impact of social team building interventions on MBA study group formation.

5.3.1 TEAM BUILDING

The measurement items for Team Building include TB1: *I learned from the group*, TB2: *The group learnt from me,* TB4: *This group will enhance my study experience* and TB6: *The group work well together as a team.* These items all refer to *team-efficacy, the "collective perceived capability of a team to work together to achieve tasks"* (Collins & Parker, 2010, p 1005). Team efficacy will influence the teams' commitment to difficult goals, how it responds to setbacks and how they discover successful task-strategies (Locke, 1996) and therefore an essential characteristic of a team. It is also an indication of the level of *trust* in the group, a critical component for open communication (Lencioni, 2002), another team viability measure. This measurement is used to describe the level of group *formation* as a result of the social team building event.

The results of the item analysis and descriptive statistics indicate that the participants experienced positive group formation during the intervention. The descriptive statistics indicated that 98% of the respondents agreed with the item TB6: *The group work well together as a team.* Upon further investigation, DV: *Team Building* ($\mu = 4.26$) had positive mean scores and had statistical significance ($p<0.0005$), with a large practical significance as the Cohen's d score was 1.75. As such, it can be concluded that the participants agreed the intervention lead to successful group formation — the Cronbach's Alpha coefficient of 0.85 established that the measurement had good reliability and internal consistency for the instrument items for Team Building (Nunnally, 1978).

The following hypotheses were proposed for the influence of the demographics on the Team Building:

Group size

H0$_{1a}$: "Group size" exerts no effect on "Team Building" [Accepted].

HA$_{1a}$: "Group size" exerts a positive effect on "Team Building" [Rejected].

%Females in group

H0$_{1b}$: "%Females in group" exerts no effect on "Team Building" [Accepted].

HA$_{1b}$: "%Females in group" exerts a positive effect on "Team Building" [Rejected].

The univariate ANOVA results indicated the selected demographic information did not have a statistical relationship with the DV: *Team Building*, with *group size* (p=0.282) and *% females in the group* (p=0.314), thus the null hypotheses (H0$_{1a}$ and H0$_{1b}$) could not be rejected.

5.3.2 AMAZING RACE EVENT

Klein et al. (2009) describe team building as an intervention that does not target skill-based competencies is often not systematic and is typically done in settings that do not approximate the actual performance environment. *Social team building* usually involves some non-work related problem-solving tasks performed by a team during a one or two-day off-site excursion. The event can be used to identify how a team solves problems and where potential bottlenecks can occur. It also helps to improve interpersonal relationships, since the group members are forced to interact outside of the work environment. A successful social team building intervention will include tasks that are high in *Task Interdependence*, "*the degree to which group members have to share or exchange information, materials, or expertise to achieve the desired group performance*" (Kleingeld, van Mierlo & Arends, 2011), in order to test the *team-competencies* of the group.

The results of the item analysis and descriptive statistics indicate that the participants experienced the *Amazing Race* event as positive. Upon further investigation, IV: *Amazing Race* (μ = 4.32) had positive mean scores and had statistical significance (p<0.0005), with a large practical significance as the Cohen's d score was 2.07. As such, it can be concluded that the participants agreed that the Amazing Race as a social team building event was positive. The Cronbach's Alpha coefficient of 0.85 established that the measurement had good reliability and internal consistency of the research instrument for the Amazing Race

event (Nunnally, 1978). The event had a moderate positive correlation (0.565) with the DV: *Team Building.*

5.3.3 GROUP COMMUNICATION

Effective *group communication* has been shown to be an essential prerequisite for a team's structure, collaboration and task performance (Salas et al., 2008b) and therefore a critical *team process* (Tannenbaum, Beard & Salas, 1992) that affects the ultimate performance of a team in multiple ways. This factor measured the respondents' perceptions regarding group communication *during* the social team building event. The following hypotheses regarding group communication were made:

> $H0_3$: "Amazing Race" exerts no effect on "Group Communication" [Rejected].
> HA_3: "Amazing Race" exerts a positive effect on "Group Communication" [Accepted].

> $H0_6$: "Group communication" exerts no effect on "Team Building" [Rejected].
> HA_6: "Group communication" exerts a positive effect on "Team Building" [Accepted].

The result of the item analysis and descriptive statistics indicate that the participants experienced positive group communication during the intervention. Upon further investigation, IntV1: *Group Communication* ($\mu = 3.96$) had positive mean scores and had statistical significance ($p<0.0005$), with a large practical significance as the Cohen's d score was 1.02. As such, it can be concluded that the participants reported that group communication during the event was overall positive. The Cronbach's Alpha of 0.69 established that the measurement had fair reliability and internal consistency for the measurement items for Group Communication (Nunnally, 1978).

The group communication had a moderate positive correlation (0.457) with the DV: *Team Building* and a low positive correlation (0.325) with the IV: *Amazing Race*. Pearson's Chi-square tests of independence showed that Group Communication had medium practical significant relationships with IV: *Amazing Race* ($p<0.005$, Cramer's V=0.28) and DV: *Team Building* ($p<0.005$, Cramer's V = 0.29). Thus the null hypotheses (HO_3 and HO_6) are rejected and therefore the alternate hypotheses (HA_3 and HA_6) is accepted.

The Chi2 test shows whether or not there is a relationship between two variables, but it cannot determine causality (Gravetter & Wallnau, 2009, p. 604). The research design (no pre-test and no control group) used in this study did not allow for the determination of causal relationships. Communication *during* the Amazing Race was measured. Thus it is not sure whether or not the cause (Amazing Race) happened before the effect (Group Communication), i.e. positive communication during the event could influence the participant's perceptions of the Amazing Race Event. The group did not meet before the event. Thus the temporal order for HA_6 is correct. However, causality cannot be established, as other plausible explanations need to be explored.

5.3.4 GROUP COHESION

Deeter-Schmelz, Kennedy and Ramsey (2002) found that cohesion directly influenced "*teamwork*" a team process variable and indirectly the performance and goal achievement of the group. This factor measured the respondents' perceptions regarding group cohesion *during* the social team building event. The following hypotheses regarding group cohesion were made:

$H0_2$: "Amazing Race" exerts no effect on "Group Cohesion" [Rejected].

HA_2: "Amazing Race" exerts a positive effect on "Group Cohesion" [Accepted].

$H0_5$: "Group Cohesion" exerts no effect on "Team Building" [Rejected].

HA_5: "Group Cohesion" exerts a positive effect on "Team Building" [Accepted].

The result of the item analysis and descriptive statistics indicate that the participants experienced positive group cohesion during the intervention. Upon further investigation, IntV2: Group Cohesion ($\mu = 4.39$) had positive mean scores and had statistical significance ($p<0.0005$), with a large practical significance as the Cohen's d score was 2.37. As such, it can be concluded that the participants felt that group cohesion was positive during the team building event. The Cronbach's Alpha of 0.85 established that the measurement had good reliability and internal consistency for the measurement items for Group Cohesion (Nunnally, 1978).

The group cohesion had a moderate positive correlation (0.575) with the DV: *Team Building* and a moderate positive correlation (0.437) with the IV: *Amazing Race.* Pearson's Chi-square tests of independence showed that Group Cohesion had a medium practical significant relationship with IV: *Amazing Race* ($p<0.005$, Cramer's V=0.34) and a large practical significant relationship with DV: *Team Building* ($p<0.005$, Cramer's V = 0.43). Thus the null hypotheses (HO_2 and HO_5) are rejected and therefore the alternate hypotheses (HA_2 and HA_5) is accepted.

The Chi2 test shows whether or not there is a relationship between two variables, but it cannot determine causality (Gravetter & Wallnau, 2009, p. 604). Also, the research design (no pretest and no control group) used in this study did not allow for the determination of causal relationships. Group Cohesion *during* the Amazing Race was measured. Thus it is not sure whether or not the cause (Amazing Race) happened before the effect (Group Cohesion), i.e. high levels of Group Cohesion experienced during the event could influence the participant's perceptions of the Amazing Event. The group did not meet before the event. Thus the temporal order for HA_5 is correct. However, causality cannot be established, as other plausible explanations need to be explored.

5.3.5 GOAL SETTING

Team efficacy has been shown to have a positive relationship with objective performance measures (Collins & Parker, 2010, p. 1005). Team efficacy influences the teams' commitment to difficult goals, how it responds to setbacks and how they discover successful task-strategies (Locke, 1996) and is, therefore, an essential characteristic of a team. Thus, teams that set strategic goals have the belief that they could be successful in a particular task. This factor measured the respondents' perceptions regarding goal setting *during* the social team building event. The following hypotheses relating to goal setting were made:

$H0_4$: "Amazing Race" exerts no effect on "Goal Setting" [Rejected].
HA_4: "Amazing Race" exerts a positive effect on "Goal Setting" [Accepted].

$H0_7$: "Goal setting" exerts no effect on "Team Building" [Rejected].
HA_7: "Goal setting" exerts a positive effect on "Team Building" [Accepted].

The result of the item analysis and descriptive statistics indicate that the participants experienced a positive goal setting during the intervention. Upon further investigation, IntV3: Goal Setting ($\mu = 3.96$) had positive mean scores and had statistical significance ($p < 0.0005$), with a large practical significance as the Cohen's d score, was 0.91. As such, it can be concluded that the participants felt that goal setting was positive during the team building intervention. The Cronbach's Alpha of 0.84 established that the measurement had good reliability and internal consistency for the measurement items for Goal Setting (Nunnally, 1978). The goal setting had a moderate positive correlation (0.529) with the DV: *Team Building* and a moderate positive correlation (0.402) with the IV: *Amazing Race.*

Pearson's Chi-square tests of independence showed that Goal Setting had a medium practical significant relationship with IV: *Amazing Race* ($p < 0.005$, Cramer's V = 0.34) and a large practical significant relationship with DV: *Team Building* ($p < 0.005$, Cramer's V = 0.41). Thus the null hypotheses (HO_4 and HO_7) are rejected and therefore the alternate hypotheses (HA_4: "Amazing Race" exerts a positive effect on "Goal Setting and HA_7: "Goal setting" exerts a positive effect on "Team Building") are accepted.

The Chi2 test shows whether or not there is a relationship between two variables, but it cannot determine causality (Gravetter & Wallnau, 2009, p. 604). Also, the research design (no pretest and no control group) used in this study did not allow for the determination of causal relationships. Goal Setting *during* the Amazing Race was measured. Thus it is not sure whether or not the cause (Amazing Race) happened before the effect (Goal Setting), i.e. high levels Goal Setting during the event could positively influence the participant's perceptions of the Amazing Event. The group did not meet before the event. Thus the temporal order for HA_7 is correct. However, causality can't be established, as other plausible explanations need to be explored.

5.4 THE TESTED MODEL FOR THE EVALUATION OF SOCIAL TEAM BUILDING INTERVENTIONS

The conceptual model for evaluating the effect of social team building interventions on MBA study group formation from Chapter 2 was found not to be a feasible model after CFA and SEM were conducted. As such, two additional models were explored. Model 3, illustrated in

Figure 4-9 proved to be an improved model for the evaluation of social team building interventions, since all the proposed relationships in the new model were statistically significant. However, the fit measures, NFI=0.79 (≥0.92) and AGFI=0.79 (≥0.95), did not meet the requirements for an acceptable model. In this model, IV: *Amazing Race* had significant relationships with the intermediate variables (IntV1: *Group Cohesion*, IntV2: *Group Communication* and IntV3: *Goal Setting*) and directly linked to the dependent variable DP: *Team Building* with a significant relationship. This would suggest that the social team building intervention directly influenced the DP: *Team Building* and the IntV's did not play a moderating role.

5.5 MANAGERIAL RECOMMENDATIONS

The managerial recommendations are formulated to bridge the gap between the literature and the results of the empirical study. These recommendations aim to improve the methods used to evaluate the effect of social team building interventions on MBA study groups, which addresses the research problem: *The Nelson Mandela Business School needs to determine if their social team building interventions have an impact on MBA study group formation.*

The following observations and managerial recommendations are provided:

- The limitations of the simple One-Group Post-test experimental design was highlighted extensively during the literature review, experimental section and the discussion of the results. It must be recognised however that the main goal of this social team building event is for student orientation purposes and not to be a controlled experiment to evaluate social team building interventions. Thus, including a control group of students, where certain students are intentionally excluded from the team building event will be unethical (Shadish, Cook & Campbell, 2002, p. 287). Given all the methodological limitations, this event could act as a *pre-test* measurement for the MBA study groups during the forming stage at the start of the programme. Future team development interventions can be applied to the same groups later in the academic programme. The effectiveness of the future interventions can then be evaluated using a post-intervention observation using the same measurement instrument and additional experimental design elements such as random assignment might be included in the future study to determine causal relationships.

- Include more qualitative open-ended questions on the questionnaire. Rushmer (1997) argued that most of the previous quantitative research efforts have been fruitless to determine the effectiveness of team building interventions. He argues that the effects of the intervention are only the start of a process towards becoming a team and it is more useful to determine what happened *during* the event. During the *forming stage* at the beginning of the programme group members typically want to avoid conflict, are somewhat anxious and positively excited about the MBA studies, according to Tuckman and Jensen (1997). Thus, the responses of the quantitative questions were all overwhelmingly positive and all the factors had correlations of practical significance (>0.300). However, during the qualitative feedback, some respondents reported that they found the event to be "*too long*", "*unorganised*" and "*physically demanding*". Also, Cullen and Calitz (2016) investigated the perceived effectiveness of *existing* MBA study groups the Nelson Mandela University Business School using the Group Management Questionnaire (GMQ) and found that only 32% of the groups reported that they operate effectively in all of the measured categories. Thus, the stage of team development influences the perceptions of the participants, which could affect the measurement (Tannenbaum, Beard & Salas, 1992).

- The questionnaire items were not operationalised from established literature. The reliability and internal consistency of the measurement items to the proposed theoretical construct were confirmed using Cronbach's Alpha and Exploratory Factor analysis during the quantitative statistical analysis. The validity, however, remains uncertain. It could be argued that some of the items could represent another theoretical construct as well. Exploratory factor analysis applied to the data without imposing the theoretically imposed factors yielded excellent agreement with the factors defined in this study. However, the item order and low number of reversed items could have influenced this (Budd, 1987). The following established measurement instruments from the literature can be adapted and used to measure the factors of this study:

  - *Team Building/Group Formation/Teamwork* – Deeter-Schmelz, Kennedy and Ramsey (2002) used a teamwork measurement scale, with high reliability and validity that was confirmed using path analysis. Mitchell (1986) used the Barret-

Leonard Relationship Inventory (Barret-Leonard, 1978) to measure the four dimensions of interpersonal relationships. The stage of group development can be measured using the Tuckman Team Maturity measurement (Barkema & Moran, 2013);

- *Group Cohesion* – Group Environment Questionnaire consists of 18-items measuring the four dimensions of team cohesion (Carron, Widmeyer & Brawley, 1985);

- *Group Communication* – SYMLOG (Keyton & Wall, 1989) contains a list of 26 adjectives that describe the communication patterns of small groups. The Group Management Questionnaire has a list of items for measuring communication in a group (Napier Group, n.d.);

- *Goal Setting* – Group Management Questionnaire has a list of items for measuring goal setting within a group (Napier Group, n.d.); and

- *Team Building Event* – A combination of direct questions, such as those asked in this study and more qualitative open-ended questions about what happened during the event (Rushmer, 1997).

- Several of the participants felt that the particular event went on too long, some thought the event was poorly organised and this created frustration. Also, the physical fitness of the students needs to be taken into account when designing a team-building exercise.

- Additional team development interventions related to the social team building event could be introduced to help MBA study group formation further. *Team training* such as a pre-event workshop (McGraw & Tidwell, 2001) could be used to inform the students about group work, stages of group development and the pitfalls of collaborative learning groups. This knowledge will help the students to identify acceptable/unacceptable group behaviour during the programme and the steps that can be taken to resolve the conflict. *Team debriefing* can be used to reflect on the

group processes during the social team building event. This knowledge can then be used to refine the team approach for the team for future group work. A *Team building* intervention focussing on goal-setting can be used to develop a team charter to act as a learning contract for the group during the study programme.

This section answered the last research question RQ$_6$: *What recommendations can be made for the design of systematic social team building interventions for an MBA programme?* and therefore addressed RO$_6$: *To formulate the guidelines for the systematic design of social team building interventions for MBA study groups.* A list of recommendations based on the outcomes of this study are summarised in Appendix D.

5.6   LIMITATIONS AND CALL FOR FUTURE RESEARCH

The majority of the limitations of the study were already discussed in the preceding section. This study used an experimental design, which makes it difficult to determine causal relationships. The social team building event formed part of the orientation at the start of the MBA programme, which limits the available experimental design choices due to practical (pre-test) and ethical (control-group) reasons.

Future research could be done, where a standardised questionnaire is developed from the literature sources mentioned in the preceding section, to evaluate the perceptions of the respondents regarding teamwork during the social team building event and to determine the stage of team maturity. This measurement can then act as a baseline measurement for the teams during the forming stage of the group. Evaluation of additional team development interventions (team training, team building) can then be made at a later stage. Additional experimental design elements might be added to the study, such as randomisation if the sample size is large enough in order to determine causal relationships for the longitudinal study.

5.7   SUMMARY

The primary objective of the study was to evaluate social team building interventions for MBA study group formation and make recommendations towards the design of evidence-based team building interventions that could enhance MBA study group performance. Additionally, a conceptual model was constructed from literature to understand the variables that influence

team performance and how team building interventions influence a team's performance. After SEM analysis was conducted, a tested model was proposed for the impact of social team building interventions on MBA study group formation.

The deliverables, based on the ROs that this treatise achieved include:

- Discuss the importance of MBA study group work;
- Identify the stages of group development to understand the dynamics during group formation;
- Discuss the factors that make an effective MBA study group;
- Discuss how social team building can be used to promote MBA study group formation;
- Construct the appropriate research design and methodology best suited to this study; and
- Formulate guidelines for the evidence-based design of social team building interventions for MBA study groups.

As such the research problem - *The Nelson Mandela Business School needs to determine if their social team building interventions have an impact on MBA study group formation*, as well as the *RQ$_M$: How effective are social team building interventions on MBA study group formation? and RO$_M$: To evaluate the effectiveness of social team building interventions on MBA study group formation?* have been adequately addressed.

Additionally, managerial recommendations, limitations to the study and call for future research were discussed. If these recommendations are implemented, the Business School could design and evaluate further team building interventions on the study programme, based on evidence and methodological rigor.

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ANNEXURES

ANNEXURE A: FULL ETHICS CLEARANCE

NELSON MANDELA

UNIVERSITY

PO Box 77000, Nelson Mandela University, Port Elizabeth, 6031, South Africa   mandela.ac.za

Chairperson: Research Ethics Committee (Human)
Tel: +27 (0)41 504 2235
charmain.cilliers@mandela.ac.za

Ref: [H18-BES-BUS-025] / Approval]

18 September 2018

Prof M Cullen
Faculty: BES

Dear Prof Cullen

TEAM BUILDING FOR BUSINESS SCHOOL STUDENTS

PRP: Prof M Cullen
PI: Prof M Cullen

Your above-entitled application served at the Research Ethics Committee (Human) for approval.

The ethics clearance reference number is **H18-BES-BUS-025** and is valid for one year. Please inform the REC-H, via your faculty representative, if any changes (particularly in the methodology) occur during this time.

An annual affirmation to the effect that the protocols in use are still those for which approval was granted, will be required from you.

We wish you well with the project.

Yours sincerely

Prof C Cilliers
Chairperson: Research Ethics Committee (Human)

Cc: Department of Research Capacity Development
        Faculty Officer: BES

ANNEXURE B: QUESTIONNAIRE

2018
TEAM BUILDING ASSESSMENT
Please tick the relevant options.

1. What qualification are you registered for?

MBA		PDBA	

2. What is your group number?

3. Where do you live?

PE		Cape Town		East London		Gauteng		Durban	

4. How many males/ females are there in your group?

Males		Females	

5. How effectively did your group work together on this project?

Poorly		Adequately		Well		Extremely well	

6. What percentage of your group participated actively? ....

7. What did you like about the event?

8. What did you dislike about the event?

9. How can the event be improved?

10. List three words that describe the event for you?

Please tick the appropriate option.

	Strongly disagree	Disagree	Not sure	Agree	Strongly agree
Group cohesion					
11. The group was well organised					
12. The members encouraged each other					
13. Group members helped each other					
14. The group was well co-ordinated					
15. The group is bureaucratic					
16. Group relationships were good					
17. The group was enthusiastic					
18. The group worked well together					
Group communication					
19. The group communicated well					
20. There was one dominant group member					
21. The group wasted a lot of time arguing					
22. The group acted too quickly without thinking things through					
23. The group discussed possible solutions to the clues					
24. All members in the group debated possible solutions to the clues					
Goal setting					
25. The group had a strategy					
26. The group came up with good ideas					
27. The group discussed their approach					
28. The group was effective					
29. The group was competitive					
30. The group compromised with each other					
31. The group focused on a specific goal					
Team building event					
32. I learned from the group					
33. The group learnt from me					
34. I am glad I am a member of this group					
35. This group will enhance my study experience					

36. The team event made me feel part of my group					
37. The group worked together as a team					
Amazing Race event					
38. I enjoyed the Amazing Race theme					
39. I have seen the Amazing Race on TV					
40. The Amazing Race provides a platform for group interaction					
41. The Amazing Race clues were easy					
42. The Amazing Race made us think and plan					
43. The Amazing race made us work as a team					
44. The event was worthwhile					
45. The Amazing Race is a great team building exercise					
46. I learned more about my team members in the Amazing Race					

Thank you for completing this questionnaire.

ANNEXURE C: TURN-IT-IN REPORT

AN EVALUATION OF SOCIAL TEAM BUILDING
INTERVENTIONS ON MBA STUDY GROUP FORMATION

ANNEXURE D: GUIDELINES FOR THE DESIGN OF TEAM BUILDING INTERVENTIONS

The Amazing Race social team building intervention received an overwhelming (> 90%) positive rating. This rating is independent of the theme used for the social team building intervention. In this study, data from the 2015 and 2017 social team building events were also analysed. These two events used a different theme, but the participant ratings were in good agreement with the 2018 Amazing Race social team building event.

The activities during the social team building event should take into consideration the physical abilities of the students. In addition, the event should be well organised and the instructions for the activities should be clear. This event is one of the first interactions between the group members and the Business School. Thus, it is important to make a professional first impression and to facilitate group member interaction without unnecessary obstacles. It is important to create a belief in the study group (*team-efficacy*) that they will be successful on the study programme.

Additional team development interventions can be employed to accelerate the study group development at the *start* of the study programme, these include:

- *Team training* event prior to social team building event. The goal of this event would be to educate the students on the theory of small groups, developmental stages of small groups and a summary of the extensive literature on the pitfalls of MBA group work;
- *Team debriefing* session to reflect on the group processes that were used during the social team building event. Through this the teams can identify potential pitfalls in future group work; and
- *Goal-setting/Role clarification team building* event in order to create clarity regarding the expectations of the group members and a set of rules how the team will function. The creation of a "team charter" or "learning contract" would be the goal of this event;

There are a number of inherent methodological limitations for the evaluation of the effectiveness of social team building interventions at the *start* of the study programme. The collection of pre-test information might be negatively perceived by the students. Also, random exclusion of students from the social team building event are counterproductive towards the

aim of the event, which is team building. Thus, a true experimental design with a randomly assigned control group for the quantitative evaluation of the effectiveness of the intervention is best left for a team building event at a different stage of the study programme. The data collected during the social team building event at the start of the programme, could act as a baseline (*pre-test*) measurement of team functioning. This can then be used as the first assessment as part of a longitudinal study of the group development during the study programme.

The post-test questionnaire should use measurement scales from literature where the reliability and validity has been proven. The managerial recommendations in Section 5.5 provided a list of literature references with standard measurement scales for the various team viability measures. In addition, the questionnaire should include open-ended qualitative questions where the participants can describe their experiences of group work during the social team building event. Objective observers who are not part of the study groups could record the group processes during the event. This can be used as additional feedback to the study groups after the event, possibly during a *Team Debriefing* session.