INFLUENCE OF EMOTIONAL INTELLIGENCE ON THE PERFORMANCE OF CONSTRUCTION DESIGN TEAMS

BY

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Declaration

I declare that the work in this thesis entitled "**INFLUENCE OF EMOTIONAL INTELLIGENCE ON THE PERFORMANCE OF CONSTRUCTION DESIGN TEAMS"** has been performed by me in the Department of Quantity Surveying, Ahmadu Bello University, Zaria.

The information derived from literature has been duly acknowledged in the text and a list of references provided. No part of this thesis was previously presented for another degree or diploma in this or any other University.

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Name of Student	Signature	Date

Certification

This thesis entitled "**INFLUENCE OF EMOTIONAL INTELLIGENCE ON THE PERFORMANCE OF CONSTRUCTION DESIGN TEAMS"** by Fatima Muhammad BELLO meets the regulations governing the award of the degree of Doctor of Philosophy of the Ahmadu Bello University, Zaria, and is approved for its contribution to knowledge and literary presentation.

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Dedication

This thesis is dedicated to my family; my father of blessed memory Alhaji Mohammed Bello Yakubu, my mother Hajiya Habiba Hayatuddeen and my siblings Fadila, Aisha, and Khadijah.

Abstract

The construction Industry has laid emphasis on technical skills for performance improvement. However, performance does not depend only on technical skills but also on people/soft skills which can be measured using Emotional intelligence (EI). EI is established to be an important competence for teamwork settings. Predominantly, previous EI studies on teams focused on individual level EI neglecting the synergy of team members in a team. Therefore this study established the influence of EI on the performance of construction design teams. A mixed-method approach was utilised in collecting data by means of questionnairre survey and focus group interview. The questionnairre was used in collecting data for leader EI, team EI and team performance while the focus group interview gave more insight on the team activities related to emotional intelligence. The Emotional and Social Competence Inventory (ESCI) and Group Emotional Competences (GEC) survey were used for team leader EI and team EI respectively. A total of 52 projects were identified and clustered into eight (8) teams. The eight (8) teams consisted of 38 individuals. Thus the questionnairre was administered to 38 respondents from which 17 valid responses were received. Only four (4) teams fulfilled the criteria for analysis in line with the ESCI and GEC. Mean, percentages and correlational analysis were utilised in the analysis of the quantitative data while content analysis was used for the qualitative data. The results obtained showed that leader EI and team EI are yet to be of strength (that is having a mean score of 4.3 or above) thereby requiring improvement. Also, the total performance scores show that team performance can also be made better especicially in teams where members come from separate firms. Furthermore, the correlational analysis revealead that Leader EI has a significant association with only the team's self-direction as indicated by the correlation coefficient value of 0.463 and significance value of 0.034 thereby suggesting that for construction

design teams the team leader EI do not contribute significantly to team performance. On the other hand TEI has significant positive association with the team's self-direction and also with the average (overall) performance as indicated by the result of the correlation to be (τb= .432, p=.046) and (τb= .401, p=.042) respectively. This suggest that TEI contributes significantly to team performance of construction design teams. Therefore, this study concludes that Team emotional intelligence has greater influence on the performance of construction design teams more than the team leader EI. Nevertheless the team leader EI has great influence on TEI norms which in turn influences team performance. Thus the study recommends that individual EI competences should be developed given that every professional in construction is a potential team leader.

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List of Abbreviations

Abbreviation	Meaning
ACH	Achievement Orientation
ADA	Adaptability
AVE	Average
BoQ	Bill of Quantities
BR	Build External Relationships
CA	Build Optimism
CAM	Coach and Mentor
CB	Demonstrate Caring
CD	Construction Drawing
CD	Creating Debate
CDT	Construction Design Team
CMT	Conflict Management
CN	Address Unacceptable Behavior
CRB	Cross-Boundary
ECI	Emotional Competency Inventory
EFQM	European Foundation for Quality Management
EI	Emotional intelligence
EMP	Empathy
EQ-i	Emotional Quotient Inventory
ESA	Emotional Self-Awareness
ESC	Emotional Self-Control
ESCI	Emotional and Social Competence Inventory
GEC	Group Emotional Competences
GEI	Group Emotional Intelligence
GO	Goal and Objectives
GRP	Group
IL	Inspirational leadership
IN	Innovation
IND	Individual
INF	Influence

IQ	Intelligence Quotient
IU	Understand Team Members
KPI	Key performance Indicator
MBNQA	Malcolm Baldrige National Quality Award
MP	Meeting procedures
OA	Organisational Awareness
PAT	Performance against Similar Teams
PEF	Team Efficiency
PFR	Teams' Possible Future Relationship
PO	Positive outlook
PQT	Quality of Teamwork
PS	Solve Problem Proactively
PSD	Teams' Ability of Self-Direction
QS	Quantity Surveyors
RM	Relationship Management
RR	Roles and Responsibilities
SA	Self-Awareness
SM	Self-Management
SoA	Social Awareness
SRT	Safety and Risk Taking
TE	Review the Team
TEI	Team Emotional intelligence
TEIQue	Trait Emotional Intelligence Questionnaire
TETfund	Tertiary Education Trust Fund
TI	Team identity
TW	Teamwork
UT	Understand Team Context
WE	Support Expression
WEIP	Workgroup Emotional Intelligence Profile

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CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

The project-based nature of construction requires different professionals to come together as a team for the project success. The Construction Design Team (CDT) is one of the numerous teams in a construction project comprising of several professionals such as the Architects, Builders, Civil Engineers, Quantity Surveyors (QS) and Service Engineers. The interdisciplinary and temporary nature of the CDT poses a challenge in managing people effectively towards ensuring a successful project delivery (Loosemore, Dainty and Lingard, 2003). The construction industry has laid emphasis to technical skills for performance improvement (citation needed). Yet, the existence of acceptable level of technical competences have not translated to an optimal performance in the construction industry (Ahmed, 2019). Studies have shown that in today's competitive and demanding workplace, success does not depends on Intelligence Quotient (IQ) which is seen as a measure for technical competences alone but also by the interpersonal (soft) skills (Kaufmann & Wagner, 2017; Robbins & Judge, 2013; Bourey & Miller, 2001; Goleman, 1995) . Thus, for a successful project delivery there is a need to have both technical competences and human factor (soft) skills (Construction Industry Training Board [CITB], 2014).

Emotional intelligence (EI) presents a useful and valid approach to the management of human capital in today's global workplace (Emmerling & Boyatzis, 2012). The concept of Emotional Intelligence (EI) refers to the ability to recognize, understand and manage emotions in one's self and others (Salovey & Mayer, 1990). Several studies have linked EI to job performance; the studies carried out in various fields such as banking, education, manufacturing, medical and so on showed that individuals/leaders with higher EI perform

better and are more successful in their careers (Praveena, 2015; Barathi, 2013; Cacamis & Asmar, 2014; Jackson, 2014; Su, 2014; Corcoran and Tormey, 2013; Shooshtarian, Ameli & Lari, 2013; Tabatabaei, Jashani, Mataji & Afsar, 2012; Mwathi, 2010; Kulkarni, Janakiram & Kumar, 2009; Suh, 2008; Turner, 2007; Lope, Grewal, Kadis, Gall & Salovey, 2006). Javed (2018) confirmed that emotionally intelligent employees can lead task in a better way, which effect performance positively.

Lindebaum (2008) and Lindebaum and Jordan (2012) pointed out the contribution of EI to the relational and interpersonal performance of the construction project manager and consequently to the success of the project teams. However, the construction industry and construction disciplines have been slow in exploring the potentials of EI (Cao & Fu, 2011; Love, Edwards, & Wood, 2011). Mischung, Smithwick, Sullivan, Kashiwagi and Perrenoud (2015b) reported a rise in interest in the area of EI towards enhancing performance with majority of the studies focusing on measuring EI of individual professionals, students and project managers. These studies concluded that individuals/ leaders with higher EI perform better and are more successful (Livesey 2017; Pryke, Lunic, & Badi, 2015; Cacamis & Asmar, 2014; Vierimaa, 2013; Adindu & Ogbu, 2012; Azad, 2011; Ogbu & Adindu, 2011; Mo, 2009; Sunindijo, Hadikusumo, & Ogunlana, 2007; Turner, 2007; Butler & Chinowsky, 2006; Chinowsky & Brown, 2004 ; Songer & Walker, 2004). Also, Satchwell and Smallwood (2016) reported that the level of EI in construction is yet to be optimal. This may be as a result of associating EI to gender and viewing EI as a form of weakness (Oke, Aigbavboa, Ngcobo & Sepuru, 2017a).

Nevertheless studies have shown that individuals' with high EI working in teams do not necessarily make an emotionally intelligent team (Feyerhem & Rice, 2002; Druskat & Wolff, 2001). The domination of work groups/teams in the work place in recent time

whereby requiring individuals to work with others to achieve work success. Several authors have pointed out that EI is a significant positive predictor of collaboration, interaction and productivity in teams (Cole, Cox, & Stavros, 2016; Saini & Soni, 2016; Hobbs & Smyth, 2012; Prati, Douglas, Ferris, Ammeter & Buckley, 2003) . This led to the emergence of the concept of collective EI of individuals working as a group/team termed as Team Emotional intelligence (TEI). TEI refers to the patterns of behaviour, or norms that develop as the group goes about its task (Wolff, 2006). Studies have established evidences of the influences of team leaders' EI on team performances (Cole et al., 2016; Stubbs, 2005; Wolff, Pescosolido, & Druskat, 2002). On the other hand varied findings exist on the relationship between team members' EI and team performance. Therefore, this study established the relationship between the team leaders' EI and team EI on the performance of construction design teams.

1.2 Statement of the Research Problem

Recent trends have shown the importance of EI particularly to teamwork settings (Wang, 2015). Specifically, Smyth (2004) reported that emotional intelligence is an important skill required for construction industry especially at the team level in order to improve performance. Studies on TEI have largely focused on individual level EI by studying the team leader EI and individual emotional intelligence of team members (Rezvani, Khosravi & Ashkanasy, 2018; Cole et al., 2016; Hobbs & Smyth, 2012; Leicht, Lewis, Riley, Messner, & Darnell, 2009; Polychroniou, 2009) . However, a team comprising of individuals with high EI do not necessarily make for an emotionally intelligent group (Feyerhem & Rice, 2002; Druskat & Wolff, 2001). This is due to a more complicated nature of team interraction to attend to another level of awareness and regulation. This

suggests that teamwork success depends on the collective EI of team members (that is team emotional intelligence).

Peltola (2016) found that TEI does not contribute to the team performance in the financial service teams while Koman and Wolff (2008) established that the EI of the team leader influences the formation of the team EI norms which further influences the team performance in military teams. However, Lee and Wong (2017) reported that team emotional intelligence is positively related to team performance in various companies within several sectors such as the banking, investment, health care, information technology and pharmaceutical industries. Whilst these relationship has been reported in other sectors, none of these studies however are representative of the construction industry due to the temporary and interdisciplinary nature of teams in construction and particularly that construction does not promote control culture by leaders as found in other settings such as the military. This therefore creates a gap in knowledge in regards to TEI and performance in construction particularly that construction industry has been characterised to have adversarial relationships and diverse competences, which can be effectively moderated by emotional competences.

1.3 Significance of the Research

EI reflects an individual's emotional awareness and emotional regulation, which are important factors of social interaction and shows the ability to recognise one's emotions and those of others so as to manage them accordingly. Hence, understanding of the EI in construction design teams would provide meaningful direction for the construction industry in regards to EI competences responsible for optimal team performance.

EI comprises of competences that can be enhanced through learning experience (Bagheri, Kosnin, & Besharat, 2013; Brackett, Rivers, & Salovey, 2011; Love et al., 2011). Thus the identified competences responsible for optimal performance in CDTs can be given more attention when training members. This will make individuals to clearly understand the importance of managing and utilising of emotions to improve performance as well as improve the EI of the individuals.

The basis of team selection for the construction project is functional in nature and as such emphasis is given on technical competences (Senaratne & Gunawardane, 2015). However, Alake, Olufunke, Folorunsho and Makanjuola (2018) revealed that soft issues also affect team members effectiveness. Furthermore, Javed (2018) asserted that performance is directly affected by the emotions and its surroundings. Thus, this study provides a basis for incorporation of both technical and soft (emotional intelligence) competences in the selection of team members in construction especially for the construction design teams.

1.4 Aim & Objectives

1.4.1 Aim

The aim of this research is to establish the influence of emotional intelligence (EI) on the performance of construction design teams with a view to identifying emotional competences responsible for the construction design team performance.

1.4.2 Objectives

The specific objectives investigated in pursuit of the research aim are to:

i. identify suitable measures of emotional intelligence, team emotional intelligence and team performance.
ii. appraise the emotional intelligence of construction design team leaders
iii. appraise the emotional intelligence of construction design teams.
iv. assess the team performance of construction design teams.
v. establish the influence of EI and TEI on the performance of the CDTs.

1.5 Scope of the Study

The scope of this research covers the concept of emotional intelligence at individual level (leader EI), team level emotional intelligence and team performance to enable a multilevel examination of the effect of EI on the team performance. These concepts were studied within context of the construction design teams of the institutional building projects funded by the Tertiary Trust Fund (TETfund) in some selected institution in the Northwest of Nigeria. TETfund projects were selected because they majorly utilise the traditional procurement route and also have an assigned project manager for each project. The construction design team members comprise of the project manager, architect, quantity surveyor, services engineer and structural engineer.

1.6 Limitations to the Study

The limitations inherent in this work are as follows:

i. The self -assessment survey may lead to subjectivity and bias, thus in assessing the team leaders' EI the 360 degree ESCI instrument was used to reduce bias

while for the TEI and performance the self-assessment measures were used and results obtained were taken as a true reflection of the activities of the team.

ii. TEI as conceptualised by Druskat and Wolff requires teams to interact regularly and must have worked for at least a period of six (6) month. These conditions may not be present in all CDTs as such, teams studied were carefully selected to fulfil these criteria.

iii. The study was based on a small sample thereby translating to a limited statistical significance and generalisability of the result. Thus a focus group interview was further conducted to give insight on the extent of the generalisability of the findings.

iv. The CDTs studied are based on projects procured through the traditional route thus the findings cannot be extended to CDTs of projects procured by other procurement routes such as the design and build procurement route.

CHAPTER TWO: LITERATURE REVIEW

2.1 The Concept/Models of Emotional Intelligence

The concept of El implies that humans are both rational and emotional beings. They are predominantly neither rational beings nor emotional beings. Hence, adaptation and coping abilities in life are dependent on the integrative functioning of both rational and emotional capacities (Salovey, Bedell, Detweiler, & Mayer, 2000). Thus bringing a new dimension to the understanding of human intelligence and behaviour. The applicability of EI can be seen in various aspect of the workplace such as; Selection, Decision Making, Creativity, Motivation, Leadership, Negotiation, Customer Service and Job Attitudes (Robbins & Judge, 2013).

Different Scholars have defined EI in varying dimensions with Salovey and Mayer (1990) making the first published attempt toward defining the concept of EI. They defined EI "as the ability to monitor one's own feeling and others' feelings and emotions, to discriminate among them and to use this information to guide one's thinking and action". Also Goleman (1998) defined EI as "…the capacity for recognising our own feeling and those of others, for motivating ourselves, and for managing emotions well in ourselves and in our relationships".

In addition to the definition by Salovey and Mayer (1990) and Goleman (1995), other scholars have defined EI in variant ways leading to the emergence of different school of thought on emotional intelligence. The predominant models of EI are the Ability Model, the Mixed Model and the Trait Model EI. The ability model originated from the work Mayer and Salovey who view EI as actual domain of intelligence composed of specific emotional and mental abilities. The mental ability model focuses on emotions

themselves and their interactions with thought (Mayer & Salovey, 1997). The mixed model which originated from the works of Goleman and Bar-On combines emotional abilities with elements of personality, motivation, and social skill (Bar-On, 1997; Goleman, 1995). The trait EI model originates from the works of Petrides and Furnham. These scholars view EI as a set of traits that relate to an individuals' ability to understand, process and use affect-laden information (Laborde et al., 2019).

However, all these EI models share a common core of basic concepts thus denoting EI generally to the abilities to recognize and regulate emotions in one's self and in others. Thereby suggesting four major EI domains namely: Self-Awareness (SA), Self-Management (SM), Social Awareness (SoA), and Relationship Management (RM). These four domains are shared by all the main variations of EI theory, though the terms used to refer to them differ. Furthermore there is a general consensus in regards to the ability of EI in the prediction of success and the potential in improving EI abilities/ competences by all the different schools of EI (Newton & Bristoll, 2014).

2.1.1 The ability model EI

The ability model of EI originated from the work of Mayer and Salovey who coined the term "emotional Intelligence". They were the first researchers that made the first published attempt toward defining the concept of EI in 1990. They later refined the definition of EI as the ability to reflect and regulate emotions so as to promote intellectual and emotional knowledge (Mayer and Salovey, 1997) . The proponents of this school of thought consider emotional intelligence as a mental ability that can be described as a standard intelligence. The ability model has four distinct branches which are, Perceiving

Emotions, Using Emotions, Understanding Emotions and Managing Emotions. The four branches of the ability are explained thus:

i. ***Emotional Perception:*** this is the first branch of the ability model of EI. It is the basic and crucial EI skill required. It entails the ability of an individual to recognize emotion in others' facial and postural expressions. The capacity to accurately perceive emotions in the face or voice of others set the starting point for more advanced understanding of emotions.

ii. ***Using Emotions to Facilitate Thought:*** this involves the capacity of emotions to assist thinking through assimilation of basic emotional experiences to perform other cognitive activities.

iii. ***Understanding Emotions:*** this reflects the capacity to analyse emotions, appreciate their probable trends over time, and understand their outcomes. The third level involves understanding and reasoning about emotions. It is the ability to understand complex emotions and emotional 'chains', how emotions transition from one stage to another. According to the proponents of the model, emotions convey information.

iv. ***Managing Emotions:*** The fourth and the highest level of emotional intelligence involves the management and regulation of emotion in oneself and others such as knowing how to calm down after feeling angry or being able to alleviate the anxiety of another person.

Mayer *et al.*, (2016) made revision to the model in the following areas:

i. Adding more abilities to the model

ii. Distinguish the four-branch model of problem-solving content from the structure of human abilities relevant to emotional intelligence,

iii. Relate emotional intelligence to closely allied broad intelligences

iv. Examine the key characteristics of the problem- solving involved, and

v. Distinguish more clearly between areas of problem-solving and areas of human mental abilities.

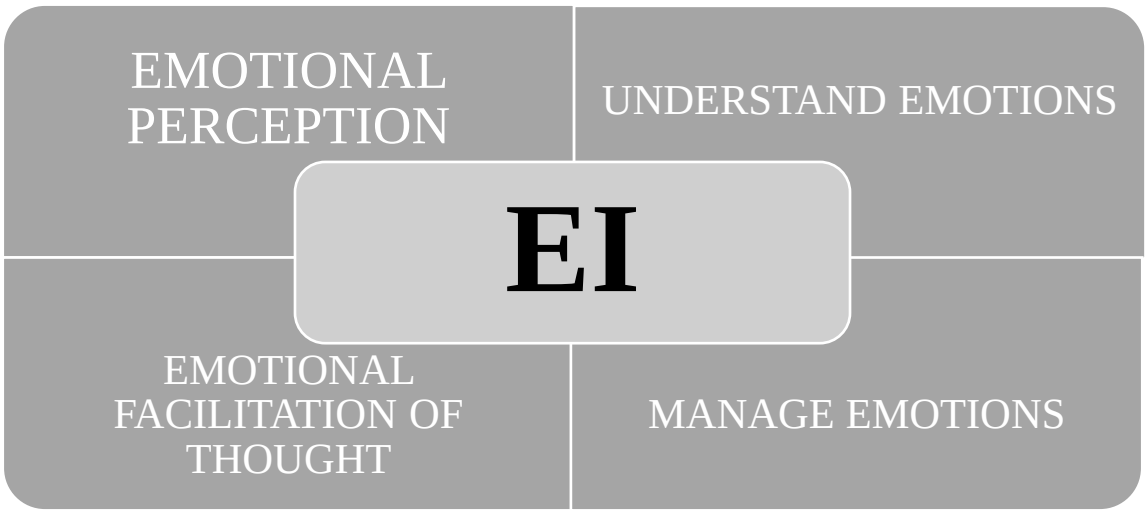

Figure 2.1: Mayer-Salovey Model of Emotional Intelligence

Source: Mayer and Salovey (1997)

Mayer *et al.*, (2016) further iterated that emotional intelligence is a mental ability separate from related "broad" intelligences; personal and social intelligences based on seven (7) principles namely:

Principle 1: Emotional intelligence is a mental ability.

Principle 2: Emotional intelligence is best measured as an ability.

Principle 3: Intelligent problem solving does not correspond neatly to intelligent behaviour.

Principle 4: A test's content (the problem solving area involved) must be clearly specified as a precondition for the measurement of human mental abilities

Principle 5: Valid tests have well-defined subject matter that draws out relevant human mental abilities

Principle 6: Emotional intelligence is a broad intelligence

Principle 7: Emotional Intelligence is a member of the class of broad intelligences focused on hot information processing

According to Mayer, Salovey and Caruso (2000) emotional intelligence involves the capacity or ability to reason with and about emotions thus they developed EI test similar to intelligence testing tradition. The most recent version of the test is the Mayer–Salovey–Caruso Emotional Intelligence Test (MSCEIT) V.2, which is an update of the Multifactor Emotional Intelligence Scale (MEIS) and Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT). The test contains 141 items and is designed to measure the four branches of Mayer and Salovey's (1997) EI ability model. Thereby providing both a total EI score, two Area scores, four Branch scores, and eight Task scores.

2.1.2 The mixed model EI

Goleman and Bar-on are the two proponents of the mixed model EI. This model include in addition to emotional abilities, a number of elements that are best described as personality dimensions. The Goleman mixed model EI presents emotional intelligence as a set of competences that contribute to performance of managers and leaders in the workplace. The EI competences of the Goleman's model are grouped into four dimensions: Self-Awareness, Self-Management, Social Awareness, and Relationship Management.

i. ***Self-Awareness*** is the keystone of EI competences; it is defined as the ability to "recognize a feeling as it happens". Self-awareness involves emotional awareness, which is deemed as the fundamental core ability of EI

ii. ***Self-Management*** is the ability to regulate moods and emotions in oneself and in other people by handling uncomfortable emotions as soon they are recognised.

iii. ***Social Awareness*** refers to how people handle relationships and awareness of others' feelings, needs, and concerns.

iv. ***Relationship Management*** concerns the skill or adeptness at inducing desirable responses in others, that is, the ability to handle the emotions of others. It is exhibited by persuasiveness, and expertise in building and leading groups and teams.

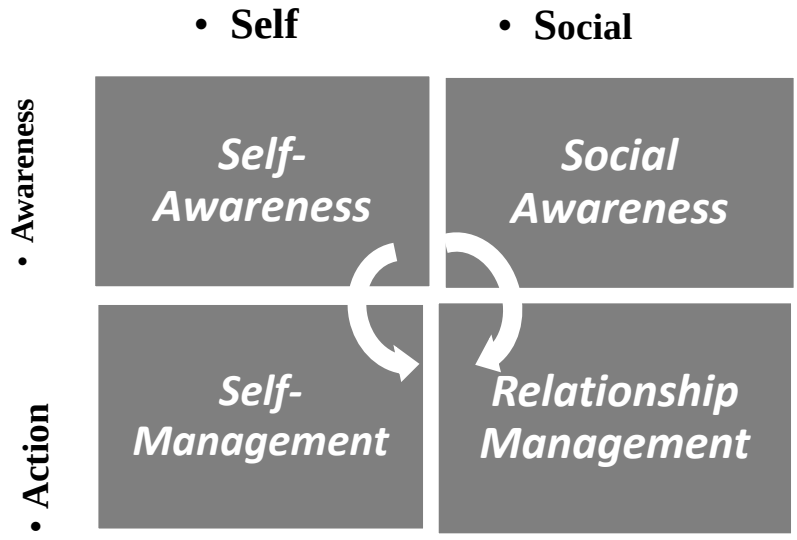

Fig. 2.2: Goleman's Emotional Intelligence Model

Source: Goleman (1990)

Based on their theory/model, the proponents of this school developed a test which focus on emotional "competences". These competences can theoretically be developed in

individuals to enhance their professional success (Goleman, 1995). Several measurement tools have been developed based on Goleman‘s model of emotional intelligence and it‘s corresponding competences. Included among these are the Emotional Competency Inventory (ECI), the Emotional Intelligence Appraisal (EIA), and the Work Profile Questionnaire – Emotional Intelligence Version (WPQei).

Daniel Goleman developed the Emotional Competency Inventory (ECI) as a measure of emotional intelligence based on his emotional intelligence competences as well as an earlier measure of competences for managers, executives, and leaders. The ECI has gone through modifications with the current version being the Emotional and Social Competency Inventory (ESCI). The ESCI is a multi-rater tool designed to collect information from the participant as well as other key individuals that observe their work life. The ESCI has both “self” and “others” versions. Others’ evaluations can come from a variety of sources including: manager, peers, direct reports, clients, etc. The ESCI comes in two version the ESCI and the ESCI-U. The ESCI measures 12 competences, organized into the four constructs outlined by Goleman‘s model of self-awareness, social awareness, self-management, and relationship management. The response format is a 5 point Likert Scale plus a “don’t know” (i.e., not applicable) option. Respondents rate how frequently they exhibit each behavior (i.e., item) of themselves or the person they are rating.

Similarly the Bar-On EI Model consists of emotional and social competences that influence performance and behavior. According to Bar-On (1996) emotional intelligence is *“*An array of non-cognitive (emotional and social) capabilities, competences and skills that influence one’s ability to succeed in coping with environmental demands and pressures” (p.35). Bar-On’s EI model focuses on five EI scales; Self-Perception,

Intrapersonal, Interpersonal, Stress management, Adaptability and General mood explained thus:

i. ***Intrapersonal***: this aspect refers to one's ability to be aware of self-emotions as well as generally understand one's self, to understand one's strengths and weaknesses, and to express feelings in a non-destructive manner.

i. ***Interpersonal***: this refers to social awareness skills and interaction. That is the ability to be aware of others' feelings, concerns and needs, and to be able to establish and maintain cooperative, constructive and mutually satisfying relationships.

ii. ***Stress Management***: This component refers to emotional management and control. It governs the ability to deal with emotions positively.

iii. ***Adaptability:*** this deals with one's ability to cope up with and adapt to personal and interpersonal change as well as change in our immediate environment.

iv. ***General Mood:*** this is closely associated with self-motivation. It determines one's ability to enjoy themselves, others and life in general, as well as influences our general outlook on life and overall feeling of contentment.

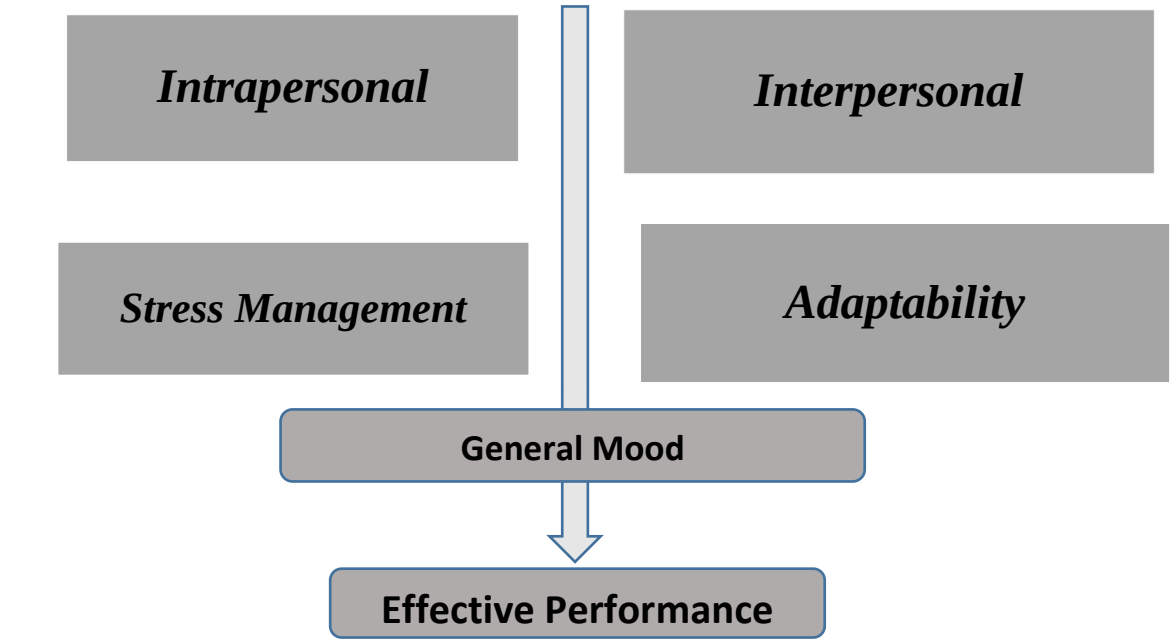

Fig. 2.3: Bar-on's Emotional Intelligence Model
Source: Bar-On (1996)

The Emotional Quotient Inventory 2.0 (EQ-i 2.0) and later the EQ-360 was developed to measure Bar-On model of emotional-social intelligence based on the Bar-On model of emotional intelligence. The measure contains 133 items self-report measure that takes approximately 30 minutes to complete. Both assessments measure emotional intelligence (EI) using one total score, five composite scores and 15 specific subscale scores. Item level results are also presented.

2.1.3 The trait model EI

Trait EI is defined as "a constellation of emotional self-perceptions located at the lower levels of personality hierarchies and measured via the trait emotional intelligence questionnaire" (Petrides, Pita and Kokkinaki, 2007b). The trait EI facets are personality traits, as opposed to competences or mental abilities or facilitators. The trait EI mixed

model presented by Petrides and Furnham (2001) and later Petrides et al., (2007b) incorporates elements from the mixed model EI. According to Laborde et al. (2019), trait EI includes behavioral tendency and self-perceived abilities and is measured by self-report. They further suggested that the Trait EI should be investigated within a personality framework. An alternative name for the same construct is trait emotional self-efficacy.

Furthermore, Petrides et al. (2016) placed the Trait EI into four clusters; Well-being, Self-control, Emotionality and Sociability. These four clusters have 15 facets.

i. ***Well-being:*** this refers to the general traits in individual such as optimism, self-esteem and happiness.
ii. ***Self-control:*** this include managing emotions in one's self.
iii. ***Emotionality:*** this encompasses emotional awareness and perception in one's self and others and the ability to fully express emotions.
iv. ***Sociability:*** this relates to relationship with others; the ability to influence change in others and also manage others' emotions.

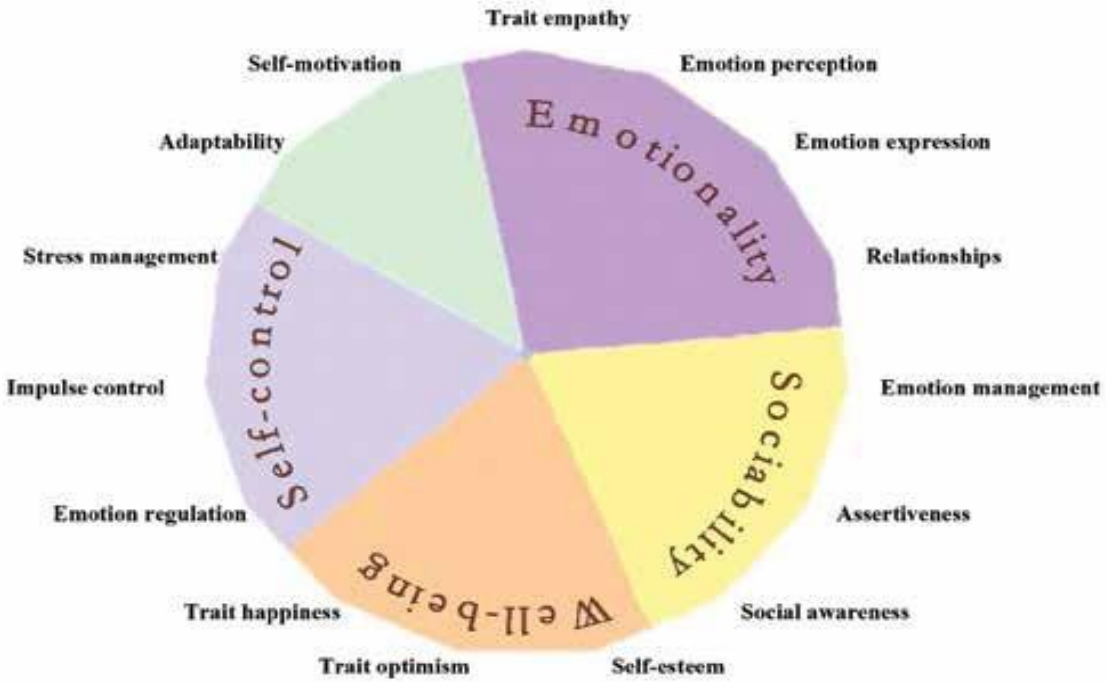

Figure 2.4: The 15 facets of the TEIQue positioned with reference to their corresponding factor.

(Note that the facets "adaptability" and "self-motivation" are not keyed to any factor, but feed directly into the global trait EI score.)

Source: Petrides and Mavroveli (2018)

Based on this model, the Trait Emotional Intelligence Questionnaire (TEIQue) was developed by Petrides which consists of 153 items, measuring 15 distinct facets, 4 factors and global trait EI. TEIQue is available, free of charge, for academic and clinical research, a wide range of materials are also available for commercial purposes. Translations and versions of the various TEIQue forms currently exist in over 20 languages. Other versions of the test are the short-form of the test is a 30-item test that measures global trait EI which was developed from the full-form TEIQue. The TEIQue-Child form specifically developed for children aged between 8 to 12 years comprising of 75 items responded to on a 5-point scale and measures nine distinct facets

(Mavroveli, Petrides, Shove, & Whitehead, 2008; Consortium for Research on Emotional Intelligence in Organizations [CREIO], 2018).

Despite some variations in existing EI models, two (2) major ingredients are present in each, namely:

i. ***Emotional Awareness***: this can be further broken down into two (2); first the emotional awareness in one's self and second, the awareness or perception of emotions in other people.

ii. ***Emotional Management***: this can be further broken down into two (2); first the emotional management in one's self and second, the management/regulation of emotions in other people.

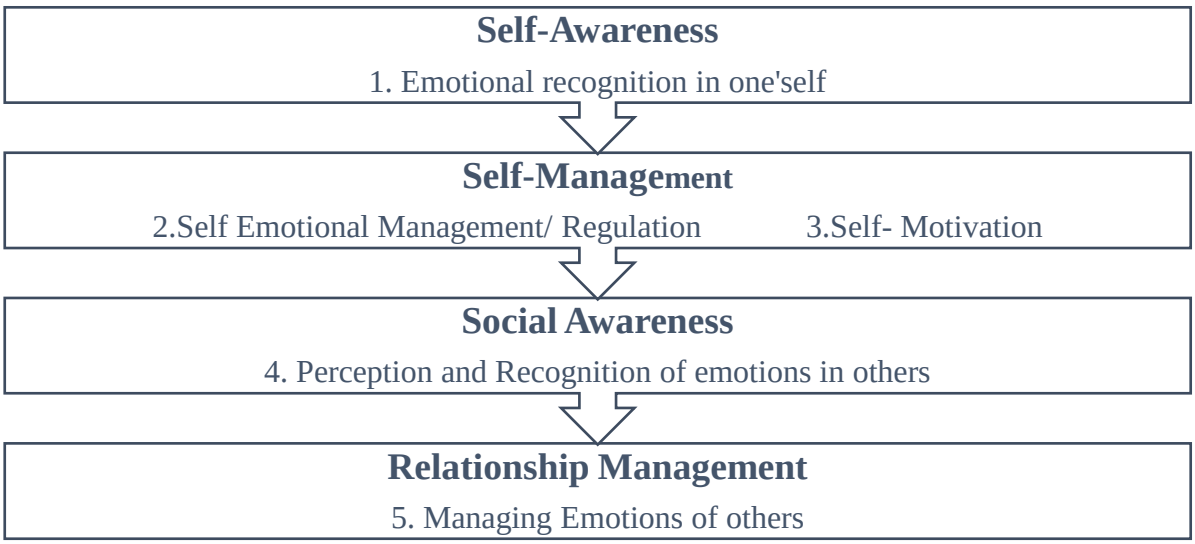

Fig. 2.5: A Generic Model of Emotional Intelligence
Source: Newton and Bristoll (2014)

In summary, Table 2.1 provide a snapshot of the founder(s), definition and measures of the predominant models of emotional intelligence as well as the applicability of each model.

Table 2.1: Summary of the Predominant Emotional Intelligence Models

MODEL	ABILITY	MIXED		TRAIT
FOUNDER(S)	John D.Mayer and Peter Salovey	Daniel Goleman	Rueven Bar-on	K.V. Petrides and Adrian Furnham
YEAR	1990	1995	1997	2001
DEFINITION	"*the ability to monitor one's own feeling and others' feelings and emotions, to discriminate among them and to use this information to guide one's thinking and action"*	*"the capacity for recognising our own feeling and those of others, for motivating ourselves, and for managing emotions well in ourselves and in our relationships"*	*"an array of non-cognitive capabilities, competences, and skills that influence one's ability to succeed in coping with environmental demands and pressures."*	*"set of traits that relate to an individuals' ability to understand, process and use affect-laden information"*
EI CLUSTERS	Perceiving Emotions, Using Emotions, Understanding Emotions and Managing Emotions.	Self-Awareness, Self-Management, Social Awareness, and Relationship Management.	Self-Perception, Intrapersonal, Interpersonal, Stress management, Adaptability and General mood	Well-being, Self-control, Emotionality and Sociability.
MEASURES	Mayer, Salovey, Caruso Emotional Intelligence Test (MSCEIT)	Emotional and Social Competences Inventory (ESCI)	Emotional Quotient Inventory (EQ-i)	Trait Emotional Intelligence Questionnaire (TEIQue)
NATURE OF MEASURE	Ability Based	Informant/ 360 Report	Self-Report	Self- Report/ informant
APPLICATION	Mental ability that can be described as a standard intelligence	Competences that contribute to performance of managers and leaders in the workplace.	Emotional and social competences that influence performance and behavior	Behavioral tendency and self-perceived abilities within a personality framework

Source: Adopted from Mo (2009)

2.1.4 Classification of emotional intelligence measures

The existence of different models/school of EI led to the emergence of different measures/ tests for measuring EI. Several measures are available for measuring EI which vary widely both in their content and method of assessment. The existing EI tests can be broadly categorised under three measurement approaches: *self-report, informants and ability-based measurement* (Mayer et al., 2000). Nevertheless there is a number of conceptual similarities in the majority of measures. In particular, the majority of EI measures are hierarchical in nature; they produce a total "EI score" for test takers along with scores on multiple facets/subscales (O'Connor , Hill, Kaya, & Martin, 2019).

2.1.4.1 *The self-report tests*

The self- reports test consists of series of questions on how an individual see himself/herself when dealing with situations, how one tends to interact with others, and how one might describe his/her mood at certain situations. Examples of self-report test are the EQ-i developed by Bar-On and trait-based measures. The self-report are usually statement with a rating scale in which individuals select the best that describe their feelings/emotions.

2.1.4.2 *The informant or 360-degree assessments*

This include a self- report assessment and also the perceptions of others such as your boss, colleagues, subordinates etc. The individuals report on same items that an individual have rated for himself. Example of a 360-degree assessment test is the EQ-360, the ECI and most recently the ESCI. Developed by Boyatzis, Goleman, and colleagues. The ESCI is a

modification and improvement of the EQ-360 and ECI and it is designed to assess emotional competences and positive social behaviours. The informant tests consists of statement with a rating scale in which an individual choose the best that describes the person being rated. A common aspect in many of these measures is the focus on emotional "competences" which can theoretically be developed in individuals to enhance their professional success (Goleman, 1995).

2.1.4.3 The ability measures

Ability EI tests measure constructs related to an individual's theoretical understanding of emotions and emotional functioning (O'Connor et al., 2019).These are structured much like an IQ tests and measure EI as an ability. These include all tests containing ability-type items and not only those based directly on Mayer and Salovey's model. People taking these assessments might be asked to recognize emotions in pictures of people, select responses to difficult life situations, or demonstrate an understanding of basic principles about emotions. These emotion-related problems are deemed to have correct or incorrect answers just as in the case of standard IQ tests (e.g., what emotion might someone feel prior to a job interview? (a) sadness, (b) excitement, (c) nervousness, (d) all of the above). An Examples of an ability based measure is the MSCEIT.

2.1.5 EI model and measure adopted for this Study

The existence of several schools of thought in emotional Intelligence domain necessitate a research standpoint. This is because the three (3) predominant school of taught differ in the conceptualization of the construct. A review of the models led to the selection of the

Goleman- Boyatzis mixed model of emotional intelligence for this study. This choice was based on the model's appropriateness because it focuses on emotional intelligence in relation to workplace performance. It is also known as EI theory of performance. Several studies have established that the model's applicability in distinguishing outstanding performers (Goleman, 2001). The Goleman's model consists of a set of competences that sum up emotional intelligence. Goleman and Boyatzis argued that competences provided a reliable way of differentiating performance in a variety of organisations. Emotional competency is a learned capacity, based on emotional intelligence, which contributes to effective performance at work (Boyatzis et al., 2017a). There are twelve (12) competences that cover the four distinct areas of Boyatzis and Goleman's EI model, namely:

i. ***Achievement orientation***: Striving to meet or exceed a standard of excellence; looking for ways to do things better, set challenging goals and take calculated risks.
ii. ***Adaptability:*** Flexibility in handling change, juggling multiple demands and adapting new ideas or approaches.
iii. ***Coach and mentor:*** The ability to foster the long-term learning or development of others by giving feedback and support.
iv. ***Conflict management:*** The ability to help others through emotional or tense situations, tactfully bringing disagreements into the open and finding solutions everyone can endorse.
v. ***Emotional self-awareness:*** The ability to understand one's emotions and their effects on performance.
vi. ***Emotional self-control:*** The ability to keep disruptive emotions and impulses in check and maintain one's effectiveness under stressful or hostile conditions.

vii. ***Empathy:*** The ability to sense others' feelings and perspectives, taking an active interest in their concerns and picking up cues to what is being felt and thought.

viii. ***Influence:*** The ability to have a positive impact on others, persuading or convincing others in order to gain their support.

ix. ***Inspirational leadership:*** The ability to inspire and guide individuals and groups to get the job done, and to bring out the best in others.

x. ***Organisational awareness:*** The ability to read a group's emotional currents and power relationships, identifying influencers, networks and dynamics.

xi. ***Positive outlook:*** The ability to see the positive in people, situations and events and our persistence in pursuing goals despite obstacles and setbacks.

xii. ***Teamwork:*** The ability to work with others toward a shared goal; participating actively, sharing responsibility and rewards and contributing to the capability of the team.

Consequently, the choice of the Goleman and Boyatzis model necessitate the use of the accompanying ESCI measure. The ESCI measures individual EI, thus relevant to this study in measuring the emotional intelligence of the team leaders. The choice of this measure is based on the reliability and validity of the measure as reported by previous studies.

2.2 Concept of Team Emotional Intelligence

Emotional intelligence has gained popularity as an essential personal factor for effective teamwork. Studies have established that leaders/team members with high EI positively influence team interaction and productivity (Barczak, Lassk, & Mulki, 2010; Cole et al., 2016; Prati et al., 2003). This has led to interest in group/team emotional intelligence. There

are two (2) terms used in describing EI in team context namely; group emotional intelligence (GEI) and team emotional intelligence (TEI). For consistency, the term TEI is used in referring to EI in groups and teams in this work. The theory of Team EI is based on the framework of awareness and regulation of emotion at a group-level and is very different from the individual-level EI of group members (Wolff, 2006).

The concept of TEI originated from the works of Goleman and Boyatzis of Emotional Intelligence. EI in particular is essential to effective team interaction and productivity of the team with the team leader serving as a motivator toward collective action, and facilitating supportive relationships among team members (Prati et al., 2003). A distinguishing feature about the group/team context is that it elicits and embodies emotion at multiple levels (i.e., individual, group, inter-group), all of which can significantly influence member behavior and group outcomes (Barsade & Gibson, 1998).

Wolff (2006) state that the EI in a group comes from the patterns of behavior, or norms that develop as the group goes about its task. Norms are standards of behaviour shared by members of a social group which can be unspoken and often unwritten set of informal rules that reflect the group's expectations on action and interactions (Druskat and Wolff 2001). In addition norms define what behaviours are acceptable or not; good or not; right or not; or appropriate or not (O'Hair and Wiemann, 2004). In addition, Emmit and Gorse (2003) state that norms can be said to be the most powerful and influential form of social control in a group setting, yet they are often the least visible. Thus, team emotional intelligence (TEI) can be defined as "the ability of a team to create norms that manage emotional processes so

as to cultivate trust, group identity, and group efficacy" (Druskat & Wolff, 2001 p.17). Later, the term was redefined as "the ability of a team to generate a set of norms that guide the emotional experience in a team in an effective way (Wolff, 2017 p.33)." This makes group EI a developed competency of behaviours and capabilities that allows for the perception, recognition, understanding and management of emotions by the group such that the group is able to successfully manage its own emotional state and also understand its context, purpose and interaction with the larger organizational emotional system (Ghuman, 2011).

2.2.1 Approaches to Team Emotional Intelligence

There is a clear association between EI and behaviour that might be productive in team contexts. Thus scholars researched its applicability in teams leading to three distinct approaches namely:

i. The application of EI theory in teams by determining the average EI of team members. This approach was promoted on the assumption that the higher the average score, the more emotionally intelligent the team (Feyerhem & Rice, 2002; Frye, Bennett, & Caldwell, 2006; Offermann , Bailey, Vasilopoulos, Seal, & Sass, 2004).

ii. Use of a specialised measure focused on behaviour in team contexts. This approach was initiated by Peter Jordan and his colleagues who developed the "Workgroup Emotional Intelligence Profile" (WEIP) and later Peer-WEIP to assess individual emotional intelligence expressed in a team context (Jordan, Ashkanasy, Hartel, & Hooper, 2002; Jordan & Troth, 2004). For both the WEIP and the Peer-WEIP, team

EI is measured as the average level of individual EI in a team. Teams with members who score higher on EI are considered to be more emotionally intelligent.

iii. TEI as a group-level (Druskat & Wolff, 2001 ; Gnatt & Agazarian, 2004; Reus & Liu, 2004) or even organization-level construct (Gnatt & Agazarian, 2004; Huy, 1999). This is because teams (or organisations) are well-known to be greater than the sum of their individual parts (Feyerherm and Rice, 2002). Thus, emotional intelligence existing in teams as a collection of norm (expectation about how team members should behave in a team) which is more than an individual team member ability. This led to the development of TEI theory by Druskat and Wolff which leverage on a group's ability to develop norms that enable a group to use awareness and management of emotion to facilitate positive outcomes. The model involves a set of nine emotionally competent norms that that lead to awareness and management of emotion in the team environment. Importantly, these behaviours can be demonstrated by any team member, regardless of a member's own level of EI. Table 2.2 provides a summary of the group norms that sums up the Team EI in groups.

Table 2.2: Team Emotional Intelligence Group Norms

Levels	Dimensions	Norms
Individual	Group Awareness of members	Understand Team Members
	Group Management of members	Address Unacceptable Behavior
		Demonstrate Caring
Group	Group Self-Awareness	Review the Team
	Group Self-Management	Support Expression
		Build Optimism
		Solve Problems Proactively
Cross-Boundary (External)	Group Social Awareness	Understand Team Context
	Group Management of External Relationships	Build External Relationships

Source: Wolff (2017)

2.2.2 Measures of team emotional intelligence

There are only two prominent tools used in measuring team emotional intelligence. They are: the Work Group Emotional Intelligence Profile (WEIP) and the Group Emotional Competence (GEC) inventory.

2.2.2.1 The work group emotional intelligence profile (WEIP)

The WEIP is a self-report measure designed to measure emotional intelligence of individuals within team context (Jordan et al., 2002). It is aligned with the Mayer and Salovey (1997) ability framework for emotional intelligence. This framework examines abilities in relation to the individuals and their abilities in dealing with other team members. The WEIP has been a valid and reliable measure, particularly within student sample populations. Several

modifications has been made to the WEIP since its first development. The latest version of the WEIP captures two dimensions of emotional intelligence: Ability to Deal with Own Emotions (Scale 1: 18 items) and Ability to Deal with Others' Emotions (Scale 2: 12 items) discerned by Jordan et al., (2002). The Scales 1 and 2 are delineated into 5 subscales. Scale 1 is composed of the subscales Ability to Recognize Own Emotions, Ability to Discuss Own Emotions, and Ability to Manage Own Emotions. Scale 2 is composed of the subscales Ability to Recognize Others' Emotions and Ability to Manage Others' Emotions. Team emotional intelligence is measured by calculating the average scores of the WEIP for all team members.

2.2.2.2 The group emotional competence (GEC) inventory

The Group Emotional Competence (GEC) inventory is based on the work of Vanessa Druskat and Steven Wolff who have pioneered the application of emotional competence concepts at the group level. The study established that group norms improve group effectiveness by building social capital. The instrument has gone through several modifications and improvements since it was first developed. The current instrument is called TEI survey and it assess norms that contributes to team emotional intelligence of a group. These norms have been established by research to be linked to team effectiveness. The reliability and validity of the instrument has been established in various studies. The instrument is a self-assessment tool containing sixty-eight (68) items measured on a five point Likert scale ranging from strongly disagree (1) to strongly agree (5).

2.2.3 TEI model and measure adopted for this study

Similar to the emotional Intelligence concept, there are also three (3) different approaches to the concept of team emotional intelligence. This also calls for a research standpoint on TEI. Hence, the most appropriate approach is the TEI group level as conceptualized by Druskat and Wolff. This is because the "intelligence" in a team comes from the patterns of behavior, or norms that develop as the team goes about its task which is very different from the individual-level emotional intelligence of team members (Wolff, 2017). This approach relies on the norms created by the team members. The norms as presented in Table 2.2 represent the TEI of the members. It is important to note that each norm by itself is not necessarily focused on emotion but rather each norm, guide behaviors which in turn have emotional outcomes (Wolff, 2017). See appendix E for full description of the norms. Nevertheless, brief description of these norms are as follows:

i. *Understand Team Members*: this norm represents ability of team members to comprehend the emotional needs, perspectives and skills of one another.
ii. *Address Unacceptable Behavior*: the ability of a team to manage members who behave contrary to the agreed/ accepted behavior (s).
iii. *Demonstrate Caring*: the degree to which a team treats its members in terms of mutual respect, allotting support, seeking perspective, and validating efforts.
iv. *Review the Team*: this entails the awareness and evaluation of teamwork processes by the team members as they carry out their tasks.
v. *Support Expression*: this norm represents the ability of a team in terms of resources in expressing emotions such as time and a language for talking about emotions.

vi. *Build Optimism*: this norm shows the ability of a team to stay positive and confident especially in challenging situations.

vii. *Solve Problems Proactively*: the ability for a team to foresee challenging situations and provide viable solution.

viii. *Understand Team Context:* this represents the ability of a team to understand the needs of other teams within the organisation as well as understand the team's contribution to the organisational goal.

ix. *Building External Relations*—this norm represents the degree to which a team actively and strategically builds relationships with other people and teams who can affect their performance and provide resources.

This approach to TEI has an accompanying measure based on the aforementioned norms. Thus the measure (TEI survey) developed by the GEI Partners was used to elicit data from the construction design teams studied. This is because the measure has been found to have good reliability and validity by various studies.

2.3 Emotionally Intelligent Leadership

George (2000) reported that emotional intelligence is worthy of consideration in leadership domain because leadership is an emotion – laden process. Turner & Müller (2006) showed that one of the most significant contributors to project success is the emotional intelligence of the project manager. All the six schools of leadership have identified EI/ relationships as major virtues for good leadership. One of the most recent leadership school is the emotional intelligence leadership school who believe that what differentiates leaders is not the IQ since

all managers have reasonable level of intelligence, rather it is their emotional response to situations termed as emotional intelligence. Several studies have establish a positive relationship between EI and success/performance of a leader (Barathi, 2013; Cacamis & Asmar, 2014; Jackson, 2014; Praveena, 2015 and Su, 2014). These studies have been carried out in several fields and can be classified into:

2.3.1 EI and Leader performance

It has been established that leaders with high emotional intelligence possess an advantage over those with lower levels of emotional intelligence in several settings. For example, findings from De Miranda (2011) and Kulkarni, et al. (2009) shows that emotional intelligence has an impact on the performance level of the managers and supervisors in organisations. Also, Prentice and King (2013) found out that emotional intelligence have a significant influence on service performance of casino hosts. Again, Praveena (2015) established that the higher the levels of emotional intelligence of bank managers the higher the levels of job performance. In addition, Langhorn (2004) provided an evidence between profit performance and the emotional intelligence pattern of the general manager in pub restaurant sector.

Specifically, Heuvel (2019) found that of the four EI behavioural categories that affect leadership effectiveness, 'Expressing emotions' and 'Regulating emotions', influence the leader effectiveness a lot more than 'Utilizing emotions' and 'Understanding emotions'. However, Trabun (2002) reported that there is no conclusive link between emotional intelligence and effective leader performance among Squad Leaders at United States Naval

Academy. Nevertheless, there is sufficient reason to believe that the abilities outlined in the emotional intelligence construct is a fundamental competency on which effective leadership can be implemented and achieved (Trabun, 2002).

Studies carried out in the education sector also establish that emotional intelligence has a positive effect on principals' leadership performance (Cook, 2006; Alghamdi, 2013; Ekeh & Oladayo, 2011). The studies also established a difference in gender with the female leaders (principals) having higher emotional intelligence than their male counterparts. However, Ekeh & Oladayo (2011) further revealed that there is no significant difference in the emotional intelligence of old and young leaders (principals) of secondary schools.

Li *et al.* (2016) found emotional intelligence to have an influence on leadership style. In specific Polychroniou (2009); Leban & Zulauf (2004); Maqbool, Sudong, Manzoor and Rashid (2017) found that leaders' emotional intelligence is positively associated with transformational leadership style which in turn affect performance positively. However, Føllesdal and Hagtvet (2013) reported that neither the four branch scores, nor the total EI score predicted transformational leadership. This difference can be attributed to the model/measure utilised in the studies; Føllesdal and Hagtvet (2013) utilised the MSCEIT measure which is an ability based emotional intelligence measure.

2.3.2 Leader EI and team performance

The emotional intelligence of the team leader is important to the effective functioning of the team (Prati et al., 2003; Sari & Indartono, 2017). This is because the leader serves as a motivator toward collective action, and facilitates supportive relationships among team members. Furthermore, the emotionally intelligent team leader also provides a transformational influence over the team. Specifically, Koman and Wolff (2008) and Boyatzis, Stubbs and Wolff (2009) found that team leader emotional intelligence affect the team norms and by extension the team performance. Also, Heuvel (2019) found out that leader effectiveness has a positive relation with the team performance.

Similarly, emotional intelligence of leaders in organisations facilitates employee's performance (Oyewunmi, Oyewunmi, & Oludayo 2015). Furthermore, Suifan, Abdallah, and Sweis (2015) reported that all emotional intelligence dimensions of self-awareness, self-management, social awareness, and relationship management positively and significantly affect all employees work outcomes.

2.4 Concept of Teams

2.4.1 Overview and definition of teams

Individuals seldom work in isolation from others as organisational tasks require inputs from several individuals. This makes work a group-based activity where each individual contributes to the success of the work. The working of groups and the influence they exert over their membership is an essential feature of human behaviour and of organisational performance (Mullins, 2010). Team and group are the two terms generally used to describe

the collection of individuals working together to achieve specific goals. This has led to the terms to be used interchangeably, however there is a subtle distinction between the two. Teams refers to a number of people who have a common goal and recognise that their personal success is dependent on the success of others. While group refers to a collection of people with some common characteristics or purpose. This means that all teams are groups but groups cannot be teams. The best differentiator as pointed out by Belbin (2012) is in size of members, with groups having a larger number than a team. The ideal number of team members is four and six. Belbin further added that term 'group' is often used in a more general sense and 'team' in a more specific context. In this study the term 'team' is used to refer to the collection of individuals working together, however 'group' or 'team' is used in accordance to the terms the authors quoted.

2.4.2 Team interaction

The effective management of work groups requires an understanding of the psychological and social influences on behaviour within organisations (Kramer, 2006). In addition to the 'personal self' the individual also has a number of 'selves' derived from different social contexts and membership of groups. Thus work teams can be better understood in the context of both the individual and the social interaction resulting from group activities in form of group norms and group social capital.

2.4.2.1 Group Norms

Groups develops a pattern of informal social relations, codes and practices that constitute acceptable group behaviour known as norms (Mullins, 2010). Mullins further added that

norms provide in addition to acceptable behaviour, system of sanctions to members who do not conform to the group norms as well as provide method of controlling conflict within the group. Established norms have been proven to improve performance (Brown, 1997). Although the behaviour and characteristics of groups change and develop over time, it is well known that groups develop (and are subject to) behavioural norms. Norms mature over time as newly formed groups develop patterns of interaction (Heinicke and Bales, 1953; Keyton, 1999). Hare (1976) stated that group norms can be so influential that some members will express a judgement differing from the one they hold privately. Norms in a group can be developed through several ways as identified by Feldman (1981) to be from:

i. Behaviour and statements made by group leaders.
ii. Establishing a precedence of a critical event for example response to exceeding deadlines of submissions.
iii. Repetitive behaviour patterns.
iv. Importing group norms from previous group experiences.

2.4.2.2 Social Capital

The social capital concept has been widely used to explain the importance of social factors to increase level of performance and achieving goals of the organisation. Edwards (2004) refers to social capital as "networks, together with shared norms, values and understanding that facilitate co-operation within and between groups". Thus an organisations' ability to foster social capital by bringing people together for recurrent interaction over time provides organisations with a performance advantage (Nahapiet and Ghoshal, 1998). The basic idea of social capital is that it improves communication between individuals, generates

cooperation that can be a benefit for the individuals and also for the organisation in general. Milana and Maldaon (2015) found that social capital can be generated through social interaction between individuals or groups which could be either negative (i.e. Negative feelings are characteristic of relations between the parties) or a positive push toward achieving the benefits. Thus social capital is a main explainer for the success of the human group (whether an organization or society) interaction as well as a more realistic indicator of the development of a group or community or society (Milana and Maldaon, 2015).

Studies have linked social capital, emotional intelligence and productivity to be highly integrated (Brooks and Nafukho, 2006). Specifically, Nazem and Gheytasi (2014) established the existence of a positive significant relationship between the principals' emotional intelligence with social capital at departments of education. Also the four dimensions of employee's EI have a significant positive impact on structural social capital and relational social capital thereby suggesting that social capital levels can be improved by enhancing the identification, development and cultivation of EI (Xiao, 2020). Similarly Leaders with high cognitive and social intelligence can help teams to form and nurture teams' social capital, the capabilities to complete projects successfully (Lee, Park and Lee, 2013).

Thus group norms and social capital in teams are very important concepts in understanding team interactions by regulating the interactions and activities of group members and creating behavioural uniformity towards the same objective. This helps a great deal to improve the effectiveness of achieving group goals.

2.4.3 Team roles

Each team member has a role within the team. The differentiation of the roles gives a structure to the work teams and forms the basis for the establishing relationships and effective team functioning. The roles may be established formally, informal or self-established. Inadequate or inappropriate role definition can result in role conflict, including role incompatibility, role ambiguity, role overload and role underload. Thus leading to apathy towards overall goals, disrupting the early stages of group development and inter-fering with the implementation of a compatible social structure for the group Bales (1970).

The characteristic behaviour of a team member, i.e., their role, in the context of the team, defines the way other team members expect them to contribute to and advance the objectives and goals of the team. Belbin (2010) identified nine team roles which he categorized into three groups: Action Oriented, People Oriented, and Thought Oriented. Each team role is associated with typical behavioural and interpersonal strengths. Belbin also defined characteristic weaknesses that tend to accompany each team role for awareness purposes as well as improvement. The Action Oriented roles are the Shaper, Implementer and the Completer-Finisher; the People Oriented roles consist of the Coordinator, Team Worker and Resource Investigator while the Thought Oriented consist of the Plant, Monitor-Evaluator and Specialist. However, Hapuarachchi and Senaratne (2008) established that construction teams development stages are similar to that of Tuckman and Jenson (1977) model however, the forming and storming stages are not experienced by the team members to the same extent as suggested by the Tuckman and Jenson. Also once a new member come into the team or a

major change in the scope of the work occur. Thus this study used teams with consistent membership for uniformity. Table 2.3 gives details of the identified team roles of Belbin.

Table 2.3: Belbin's Team Roles.

Team Roles		Description	Strengths	weakness
Action Oriented	Shaper	Challenge the team to improve	See obstacles as exciting challenges	Argumentative and that they may offend people's feelings.
	Implementer	People who get things done.	Work systematically and efficiently and are very well organized	Inflexible and can be somewhat resistant to change
	Completer-Finisher	See that projects are completed thoroughly.	Pay attention to the smallest of details	Worry unnecessarily and may find it hard to delegate.
People Oriented Roles	Coordinator	Take on the traditional team-leader role	Delegate tasks very effectively.	Delegate away too much personal responsibility, and may tend to be manipulative.
	Team Worker	Provide support and make sure that people within the team are working together effective	Prioritize team cohesion and helping people get along.	Tendency to be indecisive, and to maintain uncommitted positions during discussions and decision-making
	Resource Investigator	Innovative and curious	That others are often receptive to them and their ideas.	lose enthusiasm quickly, and are often overly optimistic
Thought Oriented Roles	Plant	Creative innovator who comes up with new ideas and approaches	Ideas are novel	Criticism is especially hard for them to deal with
	Monitor-Evaluator	Best at analysing and evaluating ideas that other people (often Plants) come up with	Critical thinkers and very strategic in their approach	Perceived as detached or unemotional poor motivators
	Specialist	Have specialized knowledge that is needed to get the job done	Commit themselves fully to their field of expertise.	Limited contribution; preoccupation with technicalities at the expense of the bigger picture.

Source: Adopted from Belbin (2010)

Senaratne and Gunawardane (2015) revealed that forming balanced teams roles is practically difficult for construction design teams because, mostly in construction project teams, team roles will be duplicated with large teams and team roles required for different project types is different (e.g., when complexity is high more members should play PL or ME role). Also, the design team selection is dependent mainly on the functional roles of the members which tend to restrict the consideration of team roles in team selection. However, adopting team role concept will help improve role learning (learning to play a needed role) in construction teams.

2.4.4 Team development process

Mullins (2010) developed a five-stage model of group development understanding group the developmental process of teams. It is a standardised sequence which group generally pass through however, not all groups follow this pattern (D'Amour, Ferrada-Videla, San Martin Rodriguez and Beaulieu, 2005). The five distinct stages as outlined by Tuckman and Jenson model (1977) are forming, storming, norming, performing and adjourning. Table 2.4 gives a brief description of the stages.

Table 2.4: Tuckman and Jenson Team Development Stages

Stages	Description
Forming	Characterised by a great deal of uncertainty about the group's purpose, structure and leadership. Group members test out what behaviours are acceptable until they begin to see themselves as part of the group.
Storming	Consists of intra-group conflicts on issues pertaining to control, resistance to group constraints thus leading to relatively clearer hierarchy of leadership within the group.
Norming	Development of close relationships and group members begin to show much cohesiveness bringing about a strong sense of group identity.
Performing	In this stage the group's effort shifts from getting to know and understand each other to that of performing the task at hand.
Adjoining	Prepares the group for its disbandment with attention moving from task performance to wrapping up activities.

Source: Adopted from Mullins (2010)

The Five-stage model assumes that a group becomes more effective as it progresses through the first four stages. A basic problem however with the model, in terms of understanding work related behaviours, is that it ignores organisational context especially in situations where group members behaviours are pre-determined and are based on specific assignments given to each member of the group (D'Amour *et al.,* 2005)

Temporary groups with deadlines don't seem to follow the usual five-stage model. Studies indicate that they have their own unique sequencing of actions (or inactions) referred to as the punctuated-equilibrium model thus (Robbins & Judge, 2013; Knights & Willmott, 2007). At their first meeting the directions to follow are sets by team members – referred to as the first Phase; this phase of group activities is characterised by inertia. At the end of the first phase a transition takes place, which occurs exactly when the group has used up half of its allotted time (referred to as the transition phase). The transition phase initiates major changes and is followed closely by a second phase of inertia. The

group’s last meeting is characterised by markedly accelerated activities. The punctuated-equilibrium model typifies the nature of teams in the construction and even more so for design teams (Lawson, 2005).

2.4.5 Team performance

According to Mickan & Rodger (2000), effective teamwork is at three different levels comprising of the organisational, team and individual level. The organisational structural characteristics of teamwork refers to the relatively stable procedures of coordination and control. While the team processes describe subtle aspects of interaction and patterns of organising that transform input into output. Lastly, individual contributions are perceived as pre-requisite characteristics of effective teamwork. These characteristics are outlined as follows:

i. Clear and distinct goal with measurable outcomes.
ii. Clear understanding of roles and responsibilities by each team member
iii. Knowledgeable members in terms of skills necessary to complete the team's task.
iv. Reasonable operating procedures such as procedures to guide meetings, decision making, planning, division of tasks, and progress evaluation.
v. Good interpersonal relationships.
vi. Sharing success and failures.
vii. Good external relationships with other teams.

Team performance can be affected by several range of factors which are grouped into the following:

2.4.5.1 Team Leadership

Scholars have argued as to the influence of the leadership such as that of the Project Manager on performance; with a school of thought believing that the competences and leadership style not having influence on the performance of teams and the other school of thought having a differing view. However evidences exists as to the importance of the EI of a leader in team performance (Prati et al., 2003; Sari & Indartono, 2017; Koman & Wolff, 2008; Heuvel, 2019). Walker (2007) also argued that in a team, works that are highly differentiated yet largely interdependent, such as that found for construction projects, the key to success is the quality and extent of the integrative effort provided by the leaders of the team to manage the process.

Within teams, leadership is considered a critical factor which facilitates effective team performance and more importantly and significantly in project-based, team-oriented tasks and set ups; particularly the transformational leadership (Tabassi, Ramli & Dashti, 2013). The leader must be knowledgeable, patient and respectful to the group. He must give proper guidance to the group and support group efforts in not only achieving the organisational goals but also group goals as well as the individual goals within the group.

2.4.5.2 Team Factors

Several sub-factors exist in terms of the team membership. They are discussed below:

i. Individuals: A group is as good as the individuals who form the group. If the individuals are dedicated and consciously aware of their roles and their responsibilities towards accomplishing their group and organisational objectives, then the group would be an effective group. It is necessary and important that all

members must share the enthusiasm of group activities and group accomplishments.

ii. Group size: It is difficult to determine as to what the optimal group size is, but such a size would depend upon the complexity of the problems that a group is expected to address. However, in general, smaller groups are more effective than the larger ones. Literature have suggested that in solving complex problems, membership size should be between seven (7) to twelve(12) members under a formal and expert leader. Whereas when situation warrant for a consensus in a conflict situation, then three (3) to five (5) members without a formal leader. It is important to have odd number of members in the group so that a majority decision can be reached and there is no deadlock.

iii. Group norms: Group norms are the informal guidelines of behaviour and a code of conduct that provides some order to group activities and operations. These guidelines are expected to be followed by all the group members. These unwritten expectations usually develop gradually as group members learn as to what behaviours are necessary for the group to function effectively. Thus, norms define the boundaries of acceptable and unacceptable behavior as well as facilitate group survival, make behavior more predicTable, avoid embarrassing situations, and express the values of the group. By pointing out when someone violates a norm, the team helps keep its performance on track. Norms in group help to shape behaviour leading the team to have less uncertainty and more efficiency in how work gets done. For example, a norm about what constitutes timely completion of tasks may help focus individual efforts. Because people act in accordance with norms, their behaviour can become predictable and provide stability to the team.

iv. Synergy: Synergy simply means that two plus two equal five. To achieve synergetic effects, the collective performance must produce better results than the sum of individual performances. Accordingly, it is important that the "right" members join a given group. Managers need to recognize that such group synergism brings special advantages with regard to cost, market power, technology or operating skills.

v. Cohesiveness: Group cohesiveness refers to the tendency of group members to unite while performing a task towards achieving a goal or to meet the emotional needs between members in the group (Abdullah, Awang and Abd Rahman, 2019). Group cohesion generally involves interpersonal attraction between members, a sense of pride by belonging to the group as well as commitment to group work. According to Abdullah *et al.* (2019) the factors that lead to group cohesiveness are communication, understandable objectives and group member's commitment as well as setting clear goals and responsibilities. In addition Abdullah *et al.* (2019) identified trust as a factor of group cohesiveness that is most important in influencing the overall performance of the team. Another factor is that the lesser the members in a team the greater the cohesiveness. Ikemenjima (2018) also found that cohesiveness influences goals and productivity in a group. Thus the cohesive groups can be a rewarding experience for the individual as well as beneficial for the organisation as it has been proven to lead to better performance, satisfaction and emotional understanding.

vi. Duration of Team Existence: The length of time a group has existed is known to influence the performance of the group. Newly formed groups are known to be relatively ineffective at first because a great deal of emotional energy is put into

establishing relationships with other group members. Once the group is established less effort is needed on these tasks and so the group can focus on the task to hand and tends to become more effective over time. Unfortunately, a change in group membership effectively renders it a new group once again and hence the group becomes less effective until relationships have been established.

Team performance refers to the outcome of actions of individual and/ or a group. Hackman (1990) classified team performance measures into:

i. the outcome of the team such as the quality of task, productivity and customer satisfaction;
ii. the specific team members' satisfaction with belonging to the group;
iii. the potential for team members to work with each other in upcoming projects.

Similarly, Wolff *et al.,* (2000) referred to group effectiveness as a multidimensional composite of productivity, work quality, performance compared to other groups, the group's ability to be self-directed, and the group's ability to continue working together effectively in the future. Stubbs (2005) developed and validated a team performance measure which was based on the Wolff's multidimensional definition of team performance. This study used the team performance measure by Stubbs (2005) to assess the team performance of the construction design teams.

2.5 The Construction Industry

The construction industry is an important sector of the economy that plays an important role in economic growth of a country. The industry divided into three categories in terms of works; the building, infrastructure (civil) and also heavy engineering subsectors (Ofore, 2006). The Building construction comprises majorly of new

construction/renovation of home buildings and construction of institutional and commercial buildings which are structures such as high-rise condos and office towers, stadiums, schools, hospitals, malls, libraries, art galleries and museums. Infrastructure construction are the construction such as highways and roads, bridges, sewers, railways, irrigation projects, flood control projects and marine construction. Lastly the heavy engineering projects which comprises of construction of huge industrial facilities like power plants, refineries, nuclear plants, mines and oil sands installations.

2.5.1 Overview of teams in construction

Project teams within construction consist of as "*the consultants, contractors, specialists and others who come together to design, manage and construct a product"* (Winch, 2002). These teams have designated functions and each teams' contribution affect the overall outcome of the project. Construction teams are multi-disciplinary in nature and most often derived from several organisations to form the project team (Emmit and Gorse, 2003). These characteristics of teams within the construction industry are bound to have some effect on their effectiveness. Thus the need to effectively manage the interactions between members for a successful project delivery (Emmitt, 2010; Herrera, Mourgues, Alarcón & Pellicer, 2020; Songer & Walker, 2004). Furthermore, Herrera et al., (2020) classified the interactions into traditional interactions and commitment management. The traditional dimensions of interaction include transfer of information, linking of trust, coordination, and collaboration and learning among team members. The dimensions of interaction associated with commitment management are associated with each of the speech acts, i.e., requirements, negotiation, declaration of completion, and declaration of acceptance (Long and Arroyo, 2018).

The consultants in the construction project are mainly known as the construction design team (CDT). The design team are the professionals that articulate the client's need into reality. These professionals are; Architect, Quantity Surveyor, Services Engineer, Structural Engineer and the Project manager (represent the client). Thus making the CDT an multidisciplinary team with its membership more often derived from separate different organisations that come together mainly for the achievement of the project goal. However, CDT members have varied values, attitudes and goals (Loosemore *et al.*, 2003). While, Walker (2007) defined team as a group that ideally ensures the business objectives of organisations are aligned within teams through common design/project objectives; conflicting and contrasting business objectives and lack of mutual accountability are known to exist in typical construction teams (Garbharran, Govender & Msani, 2012; Takim & Adnan, 2008). The interaction are particularly of great essence at the design stage because decisions made is significant to all subsequent stages.

2.5.2 Role of construction design team members in the design process

The design phase occupies a significant portion of the preconstruction phase. After ascertaining the feasibility of a project, the next step is assembling the design team. The design process takes a great deal of time as in most cases multiple revisions are expected. Revisions to a design can be warranted due to issues on costs and structural viability of the design. This process can be faced with several challenges because members require information from one another and when not available progress will be hindered. The team members usually illicit information and clarification by interacting during meetings and as well as outside formal meetings (Busseri & Palmer, 2000). Thus, success of the design team depends on the management of the interaction between members. This will help ensure that the design will progress within the project budget and time constraints. The

design process entails a synergy of activities of the design members. Each team member has roles are as follows:

2.5.2.1 The Project Manager

Emmitt (2010) states that the power, importance and involvement of professionals changes with project stage (i.e. from feasibility to design and then construction). Thus making leadership in teams quite a challenge. The continuous change in demand at different project stages leads to dominancy of specific member with the most relevant required skill for a given period of time. This attribute of the construction team makes it a self-directing team. However, in recent times, the advent of the project manager to represent the client and manage the activities of the project makes him the leader in all teams within a project. The project manager therefore leads the construction design team in terms of managing team processes and interaction.

The project manager has the overall responsibility of ensuring that all activities of the project is carried out according to the specified quality, time and budget (Anyanwu, 2013). In specific his role in the design team is to represent the client and ensure the designs are in accordance with the client's brief and within the budget. In addition, the project manager during the design process is to facilitate the flow of information between other entities involved in the process. The project manager is also responsible for ensuring that each team member has a clear understanding of the project budget and schedule. This will help ensure that the design will progress within the project budget and time constraints.

The project manager could be a professional trained in any of the construction fields as well as having a training in project management. For the construction design team, the project manager could also act as one of the professionals in the design team. For instance, the project manager who is a Quantity surveyor in profession can also be the QS on the project, thus having a dual role. The project manager, as the client's representative must submit reports periodically to the client.

2.5.2.2 The Architect

Anyanwu (2013) reported that the major role of the Architect in the design team is to help the client to formulate his requirements in an understandable form, bearing in mind any statutory conditions that may apply. The architect's designs are usually in phases:

i. The Conceptualisation Stage

   The first design is usually known as a concept/ schematic design which is a draft design that captures the client's brief. This conceptualisation stage is very important for architectural drafting services as it sets the tone for the entire project. The rough sketches are prepared to illustrate the basic concepts of the design, spatial relationships and basic form of the proposed structure. One needs the client's approval before moving on to the next stages.

ii. The Design Development Stage

   The concept design is reviewed and when necessary adjusted to meet the client's requirement especially in terms of cost. At this stage, the design is developed with all necessary details such as the planning, the exterior and the interior, material specification, general structural details, and placement of window and doors etc. The site plan, elevations, sections and views etc. are prepared to have elaborate discussions with the client so the exact idea of the final structure is conveyed

accurately. The design in this stage builds on the approved schematic design to reach a level of completeness that demonstrates the project can be built.

iii. Construction Drawings

Continuing the design process, the architect prepares drawings suitable for permit submittal and construction which are referred to as construction drawings (CDs). CDs are produced on a larger scale and describe, in detail, the components of the project for the actual construction stage, ensuring that general contractor and sub-contractors don't have any confusions or misinterpretations regarding the design. All the specifications for construction details and materials are prepared with utmost precision for construction process to be smooth and error-free. Tasks include developing the remaining elevations and beginning structural analysis as it relates to the architecture. During this phase the architect will interface with consultants (engineering, interior design, landscape, lighting, HVAC, etc.) ensuring a complete coordinated set for construction.

2.5.2.3 The Quantity Surveyor

The major concern for any client is the cost of the project, therefore the need for a professional to give advice on matters relating to the cost of the project. The quantity surveyor is the professional in construction who provides costs advice to the client. The QS provides costs advice from the start of a project by preparing a cost plan as soon as the brief is settled, an approximate cost from sketch drawings, elemental cost checks during design, so that, should the client's budget is not exceeded (Anyanwu, 2013). Subsequently, the Bill of Quantities (BoQ) is prepared from the working drawings. The BoQ forms the basis on which a contractor is selected to actualise the design. During the

preparation of the BoQ, the quantity surveyor has the opportunity to check dimensions and advice on alternative materials.

The QS roles in addition to the preparation of the BoQ include the following:

i. Advice the client on the appropriate form of contract to use.
ii. Preparation of the contract documents in close consultation with other consultants on a project.
iii. Price the BOQ which will be the yardstick for selection of the contractor.
iv. Analyse the submitted tenders and make recommendation for the best contractor suited for the project based on defined criteria.

2.5.2.4 The Engineers

The services and the structural engineers' roles are similar in that they provides optimal design solutions in terms of electrical/ mechanical and structural designs respectively. The designs are based on various analyses and calculations. Thereafter, the drawings, specifications, schedules and other relevant data are produced. The output from the engineers are also used as input by the QS in preparing the BOQ and the client in his assessment of the suitability of the project, regarding statutory requirements.

The structural engineer determines the design of the loadbearing elements of the building and ensure that each component is designed to safely withstand the loads that are imposed on the building. While the building services engineer designs and implement a range of such as the effective use of heat, light, acoustics and other electrical appliances.

This shows the existence of clear roles and responsibilities in any typical construction design team, thus there is no ambiguity on the expectations from each team member.

2.5.3 Characteristics of construction design teams

The construction design team is a multi-disciplinary in nature and also construction projects are time bound, the teams are therefore temporary in nature and dissolves as soon as the project comes to an end. This temporary social system have unique characteristics such as:

2.5.3.1 Inconsistent membership

CDTs takes it membership from several organisations and as such the representative team members can change at any given point in time due to certain circumstances such as; prolonged sick leave, demand of personnel on another project and so on (Emmitt, 2010). This leads to inconsistency which requires re-establishing communications and relationships with the new individuals.

2.5.3.2 Self-Directed

Self-directed teams are given autonomy over deciding how a job will be done. These teams are provided with a goal by the organisation while the team then determines how to achieve that goal. This is usually the case in a design team, with each member deciding on how to go about tasks. Also, in self- directed teams there is no difference in status among members which is usually the case with construction design teams. However, the advent of the project manager in construction projects makes him the default leader in design team. Nevertheless his role in the design team is to facilitate information flow among other team members.

2.5.3.3 Project cultures

Organisational culture exists in relatively stable environment unlike in multidisciplinary project environment such as the CDTs where the culture is a dynamic interaction of many organisational cultures effectively forming what is known as 'swift culture' (Emmitt, 2010). This swift culture will evolve as the organisations start interacting, producing a positive or negative culture in response to the quality of the interactions.

2.5.3.4 Differentiation

Lawrence & Lorsch (1967) defined differentiation in construction terms as: *the difference in cognitive and emotional orientation among contributors to projects who offer specialist skills*. This can be readily seen in practice where each consultant is from a separate firm. This is likely to cause larger variation in objectives and values, thus interaction and compatibility of group and individual goals in multidisciplinary groups is fundamentally different from the corresponding process in disciplinary groups. The CDT is an attempt to integrate these differentiation in terms of cognition and emotions to yield good performance. This makes it important for the individuals to reconcile their objectives with the overall group objective. This is usually done in meetings where all the professionals come together to discuss issues relevant to the project.

2.5.3.5 Sentience and interdependency

A sentient group is one to which individuals are prepared to commit themselves and on which they depend for emotional support. Walker (2007) stated that in a CDT all professionals are in some way dependent upon all the others. Although this interdependency may not be fully recognised due to the nature of the training received by

the professionals. The interdependency of the team members is due to the fact that input is required from a range of professionals to get the task and by extension the project completed. This gives rise to complex inter-relationships & interactions thus making the construction industry a typical example of complex inter-organisational interactions. Thus, conflict tends to arise at each interfacing between different stakeholders thereby having a far-reaching and profound influence on the quality, productivity, and work environment in the industry.

In summary, these characteristics and features requires attention to so as to reduce conflicts between the stakeholders. Thus the need for human resource who are both sound in technical and emotional competences to manage these complex activities coupled with complex inter-relationships & interactions for successful delivery of projects.

2.5.4 Procurement routes and team formation in construction

Despite the existence of several procurement routes such as the Design and Build, management Contracting, Public-Private partnerships and so on , several researches have reported that the traditional procurement system is the most used procurement method in the procurement of public infrastructure in Nigeria (Babatunde, Opawole and Ujaddughe, 2010; Adenuga and Dosumu, 2012; Aje, Adedokun and Igbalaye, 2018). The Traditional method involves the client to engage the services of design consultants (design team) to come up with a design and prepare contract documents. It is based on the outcome of the design phase known as the pre-contract stage that the construction takes place. Larmour (2011) stared that this method is used to describe procurement which involves the client's design team producing a full construction design. Usually the design

consultant are from separate organisations and seldom from a single organisation unlike the design and build method in which the design consultants belong to the contracting organisation. This type of team formation makes it difficult for members to easily collaborate and trust each other. Also the Public Procurement Act (PPA) supports the use of the traditional procurement route.

2.5.5 Performance Measurement in Construction

Performance measurement is an integral part of management and thus may have been exercised ever since management has existed (Bassioni, Price and Hassan, 2004). Neely et al. (2002) defined performance measurement as the process of quantifying the efficiency and effectiveness of past actions while a performance measure is a parameter used to quantify the efficiency and/or effectiveness of past actions. Performance measurement started by the use of planning and control procedures in the 1860s and 1870s to the use of return on investment and the pyramid of financial ratios in the first quarter of the 20th century. By 1925, many of the financial performance methods and techniques used today had been developed such as discounted cash flow, residual income, economic value added, and cash flow return on investment.

Similarly, performance measurement in construction has traditionally relied on time, cost and quality as the basic criteria of measuring success which have been criticized as narrow, reactive, and mostly financial (Carvalho and Rabechini, 2015). The dissatisfaction with financially based performance measurement started in the 1950s and continued to the late 1970s. The main problem lies in the fact that financial information is lagging, in the sense that it describes the outcome of managerial actions/decisions after

they occur by at least one reporting period. However, managers need current, up-to-date, and mostly nonfinancial information to be able to take better decisions/actions.

A new perspective to performance measurement emerged by the beginning of the 21st century which focused on the measuring stakeholders' needs and contributions and then on the required strategies, processes, and capabilities (Neely and Adams, 2001). Thus leading to the inclusion of non-financial measures. Performance measurement frameworks includes the Balanced Scorecard and quality-based performance excellence models, KPI, and EFQM model. Takim, Akintoye & Kelly (2003) established that construction performance can be categorised into four categories: construction project performance; construction productivity, project viability and project quality.

Yang, Yeung, Chan, Chiang and Chan (2010) reported that performance measurement studies in construction can be categorised based on three levels: project level; organisational level; and stakeholder level. At the project level overall performance or focus on partial and specials aspect have been reported by Lin and Shen (2007) which resulted in various classification of performance such as environmental performance; procurement performance; safety performance; participant's satisfaction; cost performance; quality performance; time performance and others. The organisational level performance provides a holistic view of an organisation owing to the simultaneous implementation of various projects and also a basis for pre-tender evaluation which deals with both financial aspects and non-financial measures (Lin and Shen, 2007). Performance measurement for stakeholders arises by virtues of the complex relationship among different contracting parties in the construction industry such as owners, contractors and consultants. These stakeholders contributes significantly to project success therefore, measuring the performance of various project stakeholders is all the

more important. However, Wang and Huang (2006) reported that research studies in this field are not as many as those at project and organizational levels and have focused on the manager's aspects.

Several frameworks for performance measurement in the construction industry exists which include: quality based performance excellence model; balance score card model; and KPIs model of which the EFQM excellence model and the BSC model are the most frequently applied to the organisational level and the KPI model can be used at all levels (Yang et *al.*, 2010).

2.5.5.1 Quality-based performance excellence models

Several quality-based models exist but the most-utilized models are the European Foundation for Quality Management (EFQM) Excellence Model in Europe, the Malcolm Baldrige National Quality Award (MBNQA) in the United States, and the Deming Prize in Japan. Although originally intended as business excellence models, the EFQM and Baldrige models have been used as performance measurement frameworks. They both contain criteria that require measuring of results, and their criteria can be used to identify dimensions of performance measurement. Quality model are used to measure and improve the overall quality of an organization. A general critique of the deficiencies of the overviewed performance measurement frameworks and excellence models indicates that they have one or more of the following limitations:

i. Limited/non-comprehensive performance criteria/perspectives;
ii. No relations among criteria, or if relations exist, they are simple and do not simulate actual complexities;
iii. No measure development or design process;

iv. Lack of implementation guidelines and long-term maintenance of the framework to adapt to the changing environment; and
v. Little consideration for existing performance systems and their interaction with the model/framework.

2.5.5.2 Balanced scorecard model

The BSC is "a management system that enables organizations to clarify their vision and strategy and translates them into action". The BSC framework allows most organizations to look at their performance from four perspectives:

i. financial: "How do we look to our shareholders";
ii. customers: "How do our customers see us";
iii. innovation and improvement: "How can we continue to improve our processes"; and
iv. internal process: "What must we excel at"

The BSC framework, which includes a range of "leading and lagging" indicators, is considered to be clearer and more comprehensive than the EFQM excellence models (Robinson, Sparrow, Clegg, & Birdi, 2005). It is also the most frequently used model for the performance measurement of the construction companies.

2.5.5.3 Key performance indicators model

Parmenter (2015) refers to a KPI as a measurement that demonstrates how effectively key objectives are achieved. The KPIs model, which is developed generically, has been widely applied in the construction industry and was developed by the Construction Industry Task Force (1998) in response to Egan's report (Williams, 1998) to measure project performances, based on 10 identified parameters. These consist of seven project

performance indicators; construction cost, construction time, cost predictability (design and construction), time predictability (design and construction), defects, client satisfaction with the product and client satisfaction with the service; and three company performance indicators namely; safety, profitability and productivity. The purpose of the KPI framework is to enable measurement of both project and organisational performance throughout the construction industry (Department of the Environment Transport and the Regions, 2000). The indicators developed by the CBPP are divided into two levels, project level and company level. The KPI in project level include construction cost, construction time, predictability cost, predictability time, defects, client satisfaction-product, and client satisfaction-service. The company level indicators involve safety, profitability, and Productivity. Team-based KPIs enable businesses to measure project team performance to ensure that team members are optimally working together to achieve project objectives in ways that can be directly tied back to companywide goals and strategy.

Parmenter (2015) described KPIs as either objective (quantitative) or subjective (qualitative). The objective KPIs uses mathematical formulae to calculate values such as; Overall task programs, workload efficiency, timesheet submittals, task dependencies and Project schedule. While the subjective KPIs uses opinions and personal judgment of the project stakeholders and is descriptive in nature such mentoring time, collaboration, stakeholder/client satisfaction, communication and team evaluation.

In essence the performance measurement at all levels in construction has gone beyond the financial measures to include other non-financial measures which can be obtained through objective or subjective means. KPIs measuring team performance would most likely be qualitative in nature. But a process or quantitative metric could also be used to evaluate teams depending on the nature of the project, product, service or industry since team and

individual activities may involve the utilization of specific processes or quantifiable activities to accomplish goals. However, for the in the context of this study, the non-financial measures using subjective methods were found to be adequate in measuring the performance of the design teams.

2.6 An Overview of Emotional Intelligence Research

There are several studies carried out on emotional intelligence in various sectors of the economy such as banking, education, manufacturing, medical, military, construction and so on with majority of these studies carried out in the health and manufacturing sectors. These studies have linked EI to performance positively there by establishing that individuals/leaders with higher EI perform better and are more successful in their careers. These studies can be grouped into three (3) levels: individual, team and organisational levels. At all the levels studies have cut across various aspects of organisational interaction such as communication, conflict management, culture, education, gender, human resource management, job satisfaction, knowledge management, leadership, organisational culture and stress management. Table 2.5 shows the contextual classification of EI researches across the organisational levels.

Table 2.5: Thematic Classification of Emotional Intelligence Researches

Organisational Level	**Research Themes**
Individual	Performance Conflict Management Education Gender Job Satisfaction Culture Communication Personality Stress Management
Team	Team Performance Communication Conflict Management Leadership
Organisation	Organisational Performance Communication Leadership Organisational Culture Human Resource Management Knowledge Management

There has been an increased interest in EI research in construction over the years. This is because several studies have proved that it is a significant predictor of academic and Professional success in most industries particularly in the area of human resource management. Likewise studies have showed the importance of EI as necessary and strategic component for the next generation in construction industry (Boyatzis et al., 2017b; Livesey, 2016). In addition, Oke et al. (2017b) revealed that emotional intelligence will bring forth organisational success in terms of improved communication, leadership skills, productivity and relationships which will lead to improved performance in construction.

Literature evidences shows that studies have been carried out majorly in the following areas within construction:

2.6.1 Emotional intelligence and construction curriculum

Mo (2009) presented the relevance of EI in the construction domain (both in academia and practice) by iterating the importance of developing emotional competences and abilities to foster more cooperation coordination and collaboration. Further to this, Mo (2009) measured the EI of undergraduates from a range of construction disciplines, including Civil Engineering, Construction Engineering Management, Architectural Engineering and Design Management and Commercial Management and Quantity Survey. The results revealed that construction education does not develop students' EI to a high level relative to other professions. Also, Chinowsky & Brown (2004) revealed that the EI in civil engineering students is lagging behind in comparison to liberal arts students. In addition civil engineering curriculum is at best a neutral influence on EI development. However, Livesey (2016) found out that high performing teams of architectural students consists of all members having at least an average level of EI competence.

This signifies that construction education does not currently develop students' EI to a high level resulting to construction students having lower levels of EI relative to other professions and societal groups. Summing up the relevance of EI to construction students, Livesey (2016), Oke et al. (2017b) and Konanahalli and Oyedele (2016) acknowledged that educating construction/engineering students about the value of EI will prepare them in handling emotional outburst due to high stress in practice and to be better prepared for teamwork as well as overcome the industry's resistance to the construct. These studies demonstrated the importance of EI training for students to prepare them for real life experiences.

2.6.2 Emotional intelligence and performance in construction

Emotional intelligence have proved to be a performance indicator at both individual and team level. Despite few researches within construction, there are studies that shows the relevance of EI and performance within construction. At the individual level, Mischung, Smithwick, Sullivan and Perrenoud (2015a) established that construction project workers with higher EI exhibit higher satisfaction, greater commitment towards their job, and lower turnover intentions and in turn affecting performance positively. Similarly, Azad (2011) found that emotional intelligence relates positively to performance at the team level. Thus individuals and teams with a high level of EI are more likely to maintain effective and open communication with others. In addition, Rezvani et al. (2018) found that in a large scale construction project, teams with high levels of EI are more likely to regulate their emotions to work towards a productive outcome. Thus, EI positively relates to both individual and team performance in the construction projects.

2.6.3 Emotional intelligence of project managers/leaders in construction

Emotional intelligence have been reported to be an essential social skill and relationship management tool for project managers towards an improved team working (Lindebaum, 2008). Love et al. (2011) and Butler and Chinowsky (2006) reported that a relationship exists between transformational leadership and EI in construction leaders. Butler and Chinowsky (2006) further identified five specific components of EI that are related to transformational leadership behavior at a convincing level of statistical significance of which the interpersonal skills and empathy are the key EI behaviors that need additional attention during the development of construction industry executives. However, findings from Lindebaum (2008) do not suggest a significant relationship between EI and transformational leadership and by extension with performance. This may be as a result

of the EI model adopted for the study that is, the trait EI model which is mainly based on personality trait.

Several studies have established a positive significant relationship between emotional intelligence of the project managers and their performance in construction (Butler & Chinowsky, 2006; Leicht et al., 2009; Cao & Fu, 2011; Satchwell & Smallwood, 2016; Obembe, 2017; Potter, Egbelakin, Phipps, & Balaei, 2017; Rezvani et al., 2020; Rezvani et al., 2018). Specifically, Pryke et al. (2015) deduced that emotionally intelligent project managers could enhance project teamwork through placing emphasis on emotional self-awareness and self-management. In addition, Potter et al. (2017) established that project managers and engineers with higher EI tend to use open communication and proactive leadership styles which leads to positive outcomes to the organisation. Furthermore, Sunindijo et al. (2007b) established that emotionally intelligent project managers have a likelihood of adopting a transformational leadership style in achieving effective team and project management. However, these studies considered only the input of the project manager without considering other project members contribution to the project performance.

2.6.4 Emotional intelligence and conflict resolution

Empirical evidence suggests positive link between EI and conflict management in construction (Lindebaum & Jordan, 2012; Potter et al., 2017; Sunindijo et al., 2007a). Specifically, Pryke et al. (2015) demonstrated that project managers and Engineers with high EI frequently use the accommodating conflict-resolution style which in turn leads to satisfactory results. Similarly, Khosravi, Rezvani and Ashkanasy (2020) opined that EI will assists project managers and project leaders in mitigating negative and destructive

reactions that arise from conflict events to achieve success in large-scale construction projects. Despite the positive association of EI to conflict management, few studies have been carried out in this area with attention to the project manager.

2.6.5 Emotional intelligence and construction safety

Another aspect of construction where EI plays a vital role is safety management. Evidence have shown a positive relationship between EI and safety management (Rezvani et al., 2018). In particular Sunindijo & Hadikusumo (2014) demonstrated that EI is a prerequisite of effective implementation of safety management tasks which contribute towards the improvement of safety in construction projects. Furthermore, Sunindijo & Zou (2013) suggests that construction companies should provide relevant EI training and development strategies for their project personnel towards promoting construction safety climate development and safety performance improvement.

2.6.6 Emotional intelligence and human resource training

Evidences suggest that if construction organisations focused on selecting construction managers with high emotional intelligence as well as provide training on how to become aware and utilize emotions appropriately in their role, then the CI may see a significant enhancement of effectiveness over and above that offered by operational improvements alone (Zhang & Fan, 2013). Specifically, there is a sufficient evidence that skills-based EI training improves team performance (Cacamis and Asmar, 2014).

Sunindijo & Zou (2013) found that skills-based EI training improves team work amongst construction management students which will better equip them for the industry.

Similarly, Rezvani et al. (2018) and Sunindijo & Hadikusumo (2014) demonstrated using a pre/post-test research design, the positive effects of EI training on project managers. The results however were only visible six (6) months post training and improvement was in the "understanding emotions" cluster of EI. Thus suggesting that construction organisations should consider incorporating EI into their exiting human resource development programs (Rezvani et al., 2018). Specifically, Sunindijo and Zou (2013) suggest a consideration of EI as a prerequisite selection criterion in hiring, promoting and training staff in project teams on large construction organisations.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Philosophical Consideration

The Ontological and epistemological considerations are two aspects of a Research Philosophy which help in shaping the choice of research approach and methods which are data collection techniques, data analysis and data interpretation (Al-Saadi, 2014; Scotland, 2012). The ontology is concerned with the existence of and relationship between different aspects of society, such as social actors, cultural norms and social structures. The ontological position could be either realist or relativist; the realist view the external world as a pre-existing hard, tangible structures which exist independently of an individual's cognition while the relativists hold a belief that multiple realities exist as subjective constructions of the mind.

Epistemology is concerned with the question of what is (or should be) regarded as acceptable knowledge in a discipline and is concerned with the methods through which knowledge is acquired (Al-Saadi, 2014). Epistemological considerations may either be positivist or interpretivist; positivist's position involves the application of natural science methods to study social reality while the interpretivists hold the position of the absence of universal truth and lay emphasis on realism of context and they also hold that the understanding and interpretation come from researcher's own frame of reference.

This research made a multi-level examination of the influence of emotional intelligence on performance of construction design teams and also explored the circumstances surrounding the project team interactions, thus the research holds a realist position for the ontological consideration and the positivist position for the epistemological

consideration. The realist position is taken because the existence of one's ability to manage emotions exists irrespective of one's awareness of its existence and the positivist epistemological consideration was taken as there are established ways for measuring emotional intelligence at individual, team and organisational levels.

3.2 Research Approach

The philosophical position of a study influences the research approach which in turn determines the methods or techniques to be adopted. The approach to a research could either be qualitative or quantitative or a combination of the two methods referred to as mixed method /triangulation. Qualitative research approach was originally developed in the social sciences to enable researchers to study social and cultural phenomena, it is concerned with exploration of social or human experience which follows an inductive approach in relation to theory and emphasizes words rather than quantification in the collection and analysis of data (Fellows & Liu, 2003). While the quantitative research approach was developed in the natural sciences to study natural phenomena through deductive approach in relation to theory and is concerned with the design, measurement and sampling. It follows the practices and norms of natural scientific model and views social reality as an external, objective reality. The approach employs the use of mathematical and statistical techniques to identify facts and causal relationships.

The mixed method refers to the combination of approaches in the study of the same phenomenon. It has been argued that triangulation is a means of representation based on the logic in moving closer to obtain a truer picture by making multiple measurements, using multiple methods, or at multiple levels of analysis. Typically, the triangulation

process involves corroborating evidence from different sources to shed light on a theme or perspectives. As triangulated studies employ two or more research techniques, qualitative and quantitative approaches may be employed to reduce and eliminate the disadvantages of each individual approach whilst gaining the advantages of each, and of the combination.

This research used a mixed method approach through the collection of quantitative and qualitative data and making appropriate analysis for each of the different types of data collected.

3.3 Research Methods

The objective of this research is to establish the relationship between individual emotional intelligence competences of project team leaders, team level emotional intelligence, and team performance. This study utilised the survey research technique to assess emotional intelligence of the team leaders and the team emotional intelligence. In addition, a focus group interview was conducted to give more insight on the result from the survey as well as to establish a generalisability of the survey results. Survey researches study population through sampling in order to get a representation of the whole population while a focus group is a group interview involving a small number of participants who have common traits/experiences in order to have a better understanding of participants' perceptions and experiences.

3.3.1 Population and sample selection

The population for this study is building project teams for institutional projects sponsored by Tertiary Education Trust Fund (TETfund) projects in three selected institutions in the

north-west region of Nigeria which were awarded between the period of 2010 and 2015. The selection of the projects sponsored by TETfund was mainly because of the existence of a formally assigned project manager and the traditional procurement route is used for all projects. However the study of sample from which inference about population can be drawn is needed because of the difficulties of attempting to study whole population (Fellows & Liu, 2003). However, the exact population was unknown as at the time of data collection.

Thus, owing to the temporary nature of construction teams and the nature of the study as well as the absence of an exact population, teams were identified first through a snowballing technique and also purposive sampling based on the following criteria:

i. The same team composition for at least two (2) projects.
ii. Two variables that affect group development are the length of time that a group has existed and the number of occasions that the group has met (Emmit, 2010). Thus teams having one (1) or more projects within the defect liability period as at the time for data collection were selected.
iii. Availability of all design team members to participate in the survey.
iv. Completed design stage of at least one (1) project so as to enable team make assessment of the major role of the design phase.

A total number of 58 projects were identified and narrowed to 50 based on the mentioned criteria. These projects were clustered into eight (8) teams based on the team membership. The eight (8) teams consisted of thirty-seven (37) individuals with each team comprising of the project manager, architect, quantity surveyor, services engineer

and structural engineer. In addition, a focus group interview was conducted on one of the teams to give further insight on the results from the questionnaire survey.

3.3.2 Instrument for data collection

The field study was a cross sectional examination of the emotional intelligence and Group Emotional Competency (GEC) norms that were present in team leaders and the teams in some selected construction design team. Thus, the instrument for data collection used was a structured questionnaire and focus group interview. The questionnaire (see appendix D) contained three (3) major sections; the emotional intelligence of the team leaders, the Team Emotional Intelligence (TEI) and the team Performance. The questionnaire was designed based on the Emotional and Social Competence Inventory (ESCI), TEI survey and Team performance measures. The ESCI and TEI are both proprietary instruments and require special process for research purpose.

3.3.2.1 The Emotional and Social Competence Inventory (ESCI)

The ESCI was developed by the Hay Group and grows out of the research of Richard Boyatzis and Daniel Goleman. This measure was particularly chosen due to its appropriateness in this context for two reasons: first, it relates to EI to workplace performance and second the Goleman-Boyatzis model of EI (Goleman et al. 2013) is relevant to dealing with problems in construction project management (Clarke, 2010; Mischung et.al., 2015b).

The ESCI is a 360-degree survey that allows others to rate individuals (managers and peers) and also it allows for self assessment. The ESCI contains sixty-eight (68)

statements which are grouped into twelve (12) competences. These competences are further grouped into the four (4) EI clusters of self-awareness, self-management, social awareness and relationship management. The 68 statements were on a five point likert-type scale ranging from “never” to “consistently” with an option of “don’t know” as shown on table 3.1.

Table 3.1: Sample question from the ESCI survey instrument

Item Number	Please carefully respond to each survey item below. The person you are rating:	Never	Rarely	Sometime	Often	Consistent	Don't
27	Understands social networks	□	□	□	□	□	□

The application process for the use of the ESCI for this study was initiated by contacting the Korn Ferry Hay Group on 29 September, 2017. This led to the receipt of the application materials to request the use of the ESCI 360 for research purposes. The process of completing the application took several weeks, with submission of the package to Hay Group for consideration on 26 October, 2017. The approval was obtained and the procedure to use the tool was provided to the researcher which requires the use of a dedicated website provided by the Hay group. An admimistrative log in access was provided as part of the approval to use the ESCI. A copy of the conditional use agreement is provided as appendix A .

3.3.2.2 Team Emotional Intelligence (TEI) survey

This tool is also a propriety instrument offered through the Group Emotional Intelligence (GEI) partners and developed by Druskat and Wolff. The GEI partners is a partnership of researchers and consultants that give clients research-based tools and techniques proven to create high-performing teams. The TEI survey was chosen because it addressed EI of

teams at the team-level through assessment of team norms. It contains 68 statements which are grouped into nine (9) norms, Group Fundamentalsand social capital of teams. The TEI survey statements are on a 5 point likert scale ranging from “Strongly Disagree to “Strongly Agree” as shown in Table 3.2.

Table 3.2: Sample question from the GEC survey instrument

S/ NO	There are no right or wrong answers on this questionnaire. The survey is merely a measure of the way you believe your team does things, and is aimed at understanding behaviours and needs that are characteristic of your team.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
27	Understands social networks	□	□	□	□	□

The application process for the use of the TEI survey for this study was initiated by contacting the GEI Partners on the 17th of October, 2017. This led to the receipt of the application materials to request the use of TEI survey for research purposes. The process of completing the application took several weeks, with submission of the package to GEI Partners for consideration on 21 March, 2018. The approval was obtained and the procedure on how to use the tool was provided. A copy of the conditional use agreement is provided (see appendix B).

3.3.2.3 Performance measure

Also in measuring performance of the design teams, a self-assessment team performance measure developed and tested by Stubbs (2005) was used. The measure consists of a 5-item questionnaire on a 3 point Likert-type scale namely: poor, average and outstanding. The self-assessment measure was used because it has been established by Busseri and

Palmer (2000) that construction design teams' self-assessment ratings of team process were positively related to team outcome.

3.3.2.3 Focus group interview guide

The interview was semi-structured and contained three (3) sections which focused on the constructs of the study. The aim of the interview is to gain more insight into the results obtained from the quantitative study. Thus questions asked were strictly based on the result of the questionnaire survey focusing on the experiences of the projects considered in this study and also some other experiences from other projects.

3.3.3 Survey administration

Contacts of team leaders as well as other team members were obtained by first identifying the project and the design team. E-mail messages inviting as well as seeking their consent for participation in the survey was sent to them. The message contained a link to the survey which consenting participant filled while some respondents were given hardcopy of the survey to fill. After three weeks of sending out the survey, responses obtained was poor even after sending several reminders to participants. Some respondents complained about difficulty in accessing the website for the ESCI survey due to the perculiarity of poor internet access in Nigeria. Since the use of the ESCI requires the use of a dedicated website provided by the Hay group, they were later contacted to request the survey questions in order to explore a more accessible means to respondents. The approval was given and the respondents were served with hard copy of the ESCI survey.

The TEI survey was admistered together with the performance survey through an internet survey tool (SurveyMonkey). A two (2) month subscription was obtained and the survey was sent to participants via their e-mails. Responses obtained after several reminders were poor and thus led to the renewal of the subscripton to allow more responses. After the expiration of the subscription, participants having difficlty with taking the on-line survey were served with paper based questionnairre.

3.3.4 Data analysis

The data obtained from the questionnaire survey was compiled and entered into Microsoft Excel. The analysis of the data involved the use of mean for assessing the emotional intelligence of team leaders, the team emotional intelligence and performance of the teams. A further analysis was carried out using Kendall's Tau- b correlational analysis to establish relationships between the three variables. This is because the Kendall's Tau- b assess statistical associations when the sample size is small and provides a direct interpretation in terms of the probabilities of observing the agreeable (concordant) and non-agreeable (discordant) pairs.

In addition, content analysis was used to analyse the result from the focus group interaction which lasted 97 minutes and was recorded using a mobile device. The recorded interview was later transcribed and analysed to identify major themes from the discussions.

3.4 Research Ethical Considerations

Before carrying out the research, certain ethical concerns were raised and given enough consideration to ensure the credibility of research. Some of these concerns are discussed below:

3.4.1 Informed consent

All participants were fully informed of the purpose of the research by means of preamble in the email sent detailing the purpose, procedure and the expected duration for filling the questionnaire.

3.4.2 Confidentiality

The information provided by participants was treated in strict confidentiality and the findings were only used for research purposes. In addition, anonymity was granted to all participants.

CHAPTER FOUR:RESULTS, ANALYSIS AND DISCUSSION

4.1 Responses Obtained from Questionnaire Survey and Focus Group Interview

The survey was administered between the period of January and April 2019 to eight (8) teams consisting of 37 team members. Twenty-four (24) responses were obtained as shown in Table 4.1.

Table 4.1: Breakdown of Survey Responses

Teams Studied	Number of Projects	Number of Team members	Responses Obtained	% of responses
Team 1	7	5	5	100
Team 2	2	5	4	80
Team 3	5	5	2	40
Team 4	3	5	2	40
Team 5	14	4	4	100
Team 6	3	4	1	25
Team 7	13	5	4	80
Team 8	3	4	2	50
Total	**50**	**37**	**24**	**64.86**

The distribution of the project across the teams as shown in Table 4.1 indicates that all teams have participated in at least two (2) projects. Team 5 members have the highest number of project participation while team 2 have the least number of project particpation. The number of team membership varies from four (4) to five (5) in three and five teams respectively. Teams with four (4) members have the team leader serving as one of the design professional for example the same person serving as the architect and also as the PM. Also the Table shows the percentage of responses from each team which shows that only four of the teams have at least 80% responses.

All responses were inputted into MS excel for the first part of the analysis. Each of the ESCI and TEI surveys contain 68 items. These items were sorted to give the EI competences and TEI norms for team leader and the teams respectively and the means were calculated. However, both the ESCI and TEI have stipulated conditions for including responses in the analysis. The ESCI stipulates that at least two team members should appraise the leader for the responses to be included in the analysis. Based on this condition only four (4) teams (teams 1, 2, 5 and 7) responses were considered valid for analysis. While the TEI survey stipulate that only teams with at least 75% response of members can be used to calculate the TEI of the team. Thus only four (4) teams (teams 1, 2, 5 and 7) fulfilled the criteria for inclusion in the analysis of TEI. This led to the selection of four (4) teams for the appraisal of the leader EI, TEI and performance. The basis for selection of these teams is that the teams have participation in at least two (2) projects which have spanned more than three (3) years.

Table 4.2: Profile of Valid Responses

Profile	**Team A**	**Team B**	**Team C**	**Team D**
Recurrent team participation	7	2	14	13
Time span of interaction	7 yrs	8 years	6 yrs	5 yrs
Non- Project interaction of members	Yes	Yes	Yes	Yes
Response Rate	100%	80%	100%	80%
Number of Team Members	5	5	4	5
Team Formation	Multi-disciplinary	Multi-disciplinary	Inter-firm	Inter-firm

4.1.1 Team A

The team members on these project have participated in seven (7) pojects which are a combination of new construction and rehabiliatation projects for institutional buildings.

The team members for this case are five (5) in number. All team members responded to the survey.

4.1.2 Team B

The team members on these project have participated in two (2) pojects which are new construction projects of institutional buildings. The team members for this case are five (5) in number. Only four (4) team members responded to the survey.

4.1.3 Team C

The team members on these projects have participated in fourteen (14) pojects which are construction projects of institutional buildings. The team leader (Project Manager) for this case also served as the Architect in the team making the team members for this case four (4) in number. All team members responded to the survey.

4.1.4 Team D

The team members on these projects have participated in thirteen (13) pojects which are a combination of new construction and rehabiliatation projects of institutional buildings. The team members for are five (5) in number but only four team members responded to the survey.

4.2 Emotional Intelligence Competence of Team Leaders

The assessment of the 68 items on the ESCI survey was carried out for all the four cases and the summary of the results showing the Total EI, the four (4) clusters and 12 competences is presented in Table 4.3. The results shows the assessment of the team leader's EI by the team members (known as raters). All result obtained were used in the analysis as they fulfil the ESCI requirements of:

i. There must be at least two raters in a category for that category to be considered

ii. Each rater must answer at least 75% of the questions for the data to be included,

In interpreting the result an ESCI competency is considered to be a strength of the leader when the average score of team members assessing him/her is 4.3 or higher. This is based on the criteria/interpretation provided in the ESCI technical manual.

Table 4.3: Means Scores for Emotional Intelligence Competences of Team Leaders

Emotional Intelligence	**Team A**	**Team B**	**Team C**	**Team D**
EI Competences				
Achievement Orientation	4.5	4.7	3.9	3.8
Adaptability	4.6	4.4	3.6	3.1
Coach and Mentor	4.8	4.3	3.6	3.2
Conflict Management	3.6	4.5	3.6	3.0
Emotional Self Awareness	3.8	3.8	3.2	3.7
Emotional Self-Control	4.4	4.7	3.7	4.5
Empathy	4.6	4.4	3.6	3.9
Influence	3.8	3.5	3.8	4.0
Inspirational Leadership	4.9	4.4	3.8	3.7
Organizational Awareness	4.3	4.4	3.4	4.1
Positive Outlook	4.3	4.5	3.8	4.0
Teamwork	4.7	4.8	4.1	4.8
EI Clusters				
Self-Awareness	3.8	3.8	3.2	3.7
Self-Management	4.5	4.6	3.8	3.9
Social Awareness	4.5	4.4	3.5	4.0
Relationship Management	4.4	4.3	3.8	3.7
Total EI	**4.3**	**4.4**	**3.7**	**3.8**

Twelve (12) competences sum up the emotional intelligence of an individual. The leader for team A demonstrated strength in nine (9) competences which are; Achievement Orientation, Adaptability, Coach and Mentor, Emotional Self-Control, Empathy, Inspirational Leadership, Organizational Awareness, Positive Outlook and Teamwork. Having scored less than the 4.3 threshold the leader of team 1 did not exhibit strength in

the Conflict Management, Emotional Self Awareness and Influence competences. The results shows that the highest scored competences are the Inspirational Leadership, Coach and Mentor and Teamwork while the least scored competences are Conflict Management, Emotional Self Awareness and Influence.

The leader for team B demonstrated strength in ten (10) competences which are; Achievement Orientation, Adaptability, Coach and Mentor, Conflict Management, Emotional Self-Control, Empathy, Inspirational Leadership, Organizational Awareness, Positive Outlook and Teamwork. Having scored less than the 4.3 threshold the leader of team 2 did not exhibit strength in the Emotional Self Awareness and Influence competences. The results further shows that the highest scored competences are the Teamwork, Emotional Self-Control and Achievement Orientation while the least scored competences are Emotional Self Awareness and Influence.

Whereas, of the twelve (12) competences defining a leader's EI, team C leader did not demonstrate strength in any competence indicating that none of the competences have a score of 4.3 and above. The results further shows that the highest scored competences are the Teamwork and Achievement Orientation while the least scored competences are Emotional Self Awareness and Organisational Awareness.

For team D, the team leader exhibited strength in only two (2) of the twelve competences defining EI competence namely: Teamwork and Emotional Self-Control. Thus making them the highest scored competences. The results further shows that the least scored competences are Conflict Management, Adaptability and Coach and Mentor competences.

Four clusters are known to define an individual's EI namely: Self-Awareness, Self-Management, Social Awareness and Relationship Management. Based on the competences defining these clusters, team leaders were assessed on each of these clusters. Teams A and B team leaders exhibited strength in the competences defining three of the clusters i.e Self-Management cluster, Social Awareness and Relationship Management. Having an average score of less than 4.3, both team leaders did not exhibit strength in Self-Awareness cluster.

Having scored less than the 4.3 threshold in all the four (4) clusters, teams C and D team leaders did not demonstrate strength in any of the clusters defining a leader's EI based on the EI competences.

From Table 4.3, it can be seen that the overall Leader's EI based on their Emotional Competence for the four teams have an average of 4.3, 4.4, 3.7 and 3.8 respectively. This indicates that only the team leaders for teams A and B can be said to demonstrate strength in total EI. While the team leaders for teams C and D scored below the 4.3 threshold as such do not demostrate strength in total EI.

4.3 Team Emotional Intelligence of the Construction Design Teams

The assessment of the 68 items on the TEI survey was carried out for all the four cases and the summary of the results showing the nine (9) norms, three (3) levels and Total team EI are presented in Table 4.4. The results show the assessment of the team EI by all team members. All results obtained were used in the analysis as they fulfil the requirements of 75%-80% team participation. Again the result was interpreted by

adopting the criteria provided in the ESCI technical manual. Thus a TEI Norm is considered to be a strength when the average is 4.3 or higher.

Table 4.4: Mean Scores for Team Emotional Intelligence of the Design Teams

Team EI	**Team A**	**Team B**	**Team C**	**Team D**
Norms				
Build External Relationships	4.6	4.5	4.2	3.8
Build Optimism	4.5	4.4	3.9	4.1
Demonstrate Caring	4.5	4.6	4.1	4.2
Address Unacceptable Behaviour	4.3	4.6	3.8	4.0
Understand Team Members	4.4	4.5	4.0	3.7
Solve Problem Proactively	4.6	4.6	4.2	4.0
Review the Team	3.9	4.0	3.5	3.5
Understand Team Context	4.1	4.3	3.8	3.6
Support Expression	3.9	4.1	3.2	3.5
Level				
Individual	4.4	4.5	4.0	3.9
Group	4.2	4.3	3.7	3.8
Cross Boundary	4.3	4.4	4.0	3.7
Total TEI	**4.3**	**4.4**	**3.9**	**3.8**

Source: Field Survey (2019)

Nine (9) TEI norms defines the overall team emotional intelligence. The results shows that team A demonstrated strength in six (6) norms namely: Understand Team Members, Address Unacceptable Behavior, Demonstrate Caring, Build Optimism, Solve Problem Proactively and Build External Relationships. While three (3) norms; Review the Team, Understand Team Context and Support Expression have scores less than the 4.3 threshold. In addition to the six (6) norms demonstrated by team A, team B demonstrated strength in the Understand Team Context norms. thus having only two (2) competences with scores less than the 4.3 threshold.

In contrast, teams C and D did not demonstrate strength in any of the team emotional intelligence norms. However, team C demonstrated a 'near' strength in Solve Problem Proactively and Building External Relationships norms while team D demonstrated a 'near' strength in Demonstrate Caring norm. In summary, the least scored norms for all the four (4) teams are Review the Team and Support Expression.

The result for the three (3) levels that shows that team A demonstrated strength in the Individual and cross boundary level while team B demonstrated strength in all the levels. Similar to the result of the team norms teams C and D scored below the threshold of 4.3 in all the team emotional intelligence levels thereby they did not demonstrate strength as indicated by the scores. Consequently total TEI scores for the teams A, B, C and D are 4.3, 4.4, 3.9 and 3.8 respectively which shows that teams A and B demostrate strength in team emotional intelligence while teams C and D did not.

Team emotional intelligence as conceptualised by Wolff and Druskat pastulates that TEI norms predict Group Fundamentalsand social capital. Therefore, in addition to the TEI norms, the TEI survey also measures these two (2) components. Table 4.5 shows the result of the valid responses.

Table 4.5: Group Fundamentalsand Social Capital of the Teams

Group Fundamentals	**Team A**	**Team B**	**Team C**	**Team D**
Goals & Objectives	4.7	4.6	4.2	3.8
Meeting Procedures	4.4	4.3	4.3	3.8
Roles & Responsibilities	4.7	4.6	4.2	3.9
AVE_GF	**4.6**	**4.5**	**4.2**	**3.8**
Social Capital				
Creating Debate	4.5	4.7	4.1	4.0
Innovation	4.5	4.3	4.1	3.9
Safety and Risk Taking	4.3	4.3	3.4	3.5
Team Identity	4.9	4.7	4.2	4.2
AVE. SCF	**4.4**	**4.5**	**4.0**	**3.8**

The results shows that teams A and B exhibit strength in all the attributes of the Group Fundamentals and social capital as indicated by the scores. The average scores for team C demonstrated strength in only Meeting Procedures for the Group fundamentals, team D did not demonstrate strength in any of the Group Fundamentals attributes. Also, having scored less than the 4.3 threshold score in all the attributes for Social Capital, teams C and D did not demostrate strength in the Social Capital.

4.4 Team Performance of the Construction Design Teams (CDTs)

The study used a subjective measure in assessing the team performance which was adopted from Stubbs (2005). The result is shown in Table 4.6. The performance measures were evaluated based on a 3 point Likert scale therefore for the purpose of this study the performance rating for a 3 point Likert scale used is as follows:

i. Poor - $1.00 < x < 2.00$

ii. Average - $2.01 < x < 2.50$

iii. Outstanding - $2.51 < x < 3.00$

Table 4.6: Performance of the Construction Design Teams

Performance Measures	**Team A**	**Team B**	**Team C**	**Team D**
Efficiency in work	2.4	2.5	2.3	2.0
Quality of work	3.0	2.5	2.3	2.0
Ability to be self-directed	3.0	3.0	2.3	2.3
Performance Against other teams	2.4	2.5	3.0	2.0
Future relationship	3.0	2.5	2.4	2.1
Total Performance	**2.9**	**2.6**	**2.4**	**2.2**

Five (5) measures of performance were used to define the overall performance namely: Efficiency in work, Quality of work, Ability to be self-directed, Performance Against other teams and Future relationship. Team A demonstrated outstanding performance in three (3) measures and average performance in two (2). Team B demonstrated outstanding performance in all the measures. While for both teams C and D the performance is aveage in all the measures with the exception of the "*Performance Against other teams*" measure for team C. In summary, the total performance scores shows that teams A and D have outstanding performance while teams C and D have an average performance.

4.5 Correlational analysis of Team Leader EI on Performance of Construction Design Teams

To establish the influence of leader emotional intelligence on the performance of the construction design team, Kendall's tau b was used for the analysis and the result is shown in Table 4.7. The correlation was carried out between the 12 emotional competences of the team leader and the five (5) performance measures.

Table 4.7: Correlation between Team Leader EI Competences and Performance Measures.

		PEF	PQT	PSD	PAT	PFR	AVE_P
EI_ACH	Correlation Coefficient	-.053	.454*	.417	-.065	-.012	.152
	Sig. (2-tailed)	.806	.035	.053	.762	.955	.438
EI_ADA	Correlation Coefficient	.073	.377	.487*	.130	.012	.286
	Sig. (2-tailed)	.732	.078	.023	.545	.955	.144
EI_CAM	Correlation Coefficient	.194	.582**	.400	.244	.255	.466*
	Sig. (2-tailed)	.373	.007	.066	.262	.231	.019
EI_CMT	Correlation Coefficient	-.011	.087	-.063	.168	-.257	-.078
	Sig. (2-tailed)	.960	.692	.774	.444	.231	.695
EI_EMP	Correlation Coefficient	.011	.412	.319	.141	.060	.288
	Sig. (2-tailed)	.961	.056	.139	.511	.777	.143
EI_ESA	Correlation Coefficient	-.074	-.095	.220	.065	.166	.093
	Sig. (2-tailed)	.731	.659	.306	.762	.429	.636
EI_ESC	Correlation Coefficient	-.063	.243	.294	-.218	-.060	.076
	Sig. (2-tailed)	.768	.259	.172	.312	.778	.698
EI_IL	Correlation Coefficient	.245	.373	.272	.110	.108	.316
	Sig. (2-tailed)	.258	.085	.209	.612	.610	.110
EI_INF	Correlation Coefficient	-.127	-.011	.098	-.033	.072	-.008
	Sig. (2-tailed)	.556	.961	.648	.879	.734	.966
EI_OA	Correlation Coefficient	.085	-.042	.184	.044	.131	.110
	Sig. (2-tailed)	.694	.844	.393	.840	.534	.575
EI_PO	Correlation Coefficient	.107	.021	.360	.242	.048	.214
	Sig. (2-tailed)	.622	.922	.097	.264	.821	.280
EI_TW	Correlation Coefficient	-.383	.219	.153	-.361	-.087	-.105
	Sig. (2-tailed)	.082	.320	.489	.102	.689	.600

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).
c. List wise N = 17

Two-tailed Kendall's tau-b correlation was run to determine the relationship between the twelve (12) EI competences of team leaders and performance. The performance measures

comprises of Team Efficiency (PEF), Quality of Teamwork (PQT), Teams' Ability of Self-Direction (PSD), Performance against Similar Teams (PAT) and Teams' Possible Future Relationship (PFR).

The result shows that; Achievement Orientation (EI_ACH) competence of the team leader has strong positive relationship with the performance measure PQT indicated by the significance value at 95% (τb = .454, p = .035). This suggest that the higher a leader's EI_ACH the greater the quality of work. Furthermore, EI_ACH has a weak negative relationship with PEF, PAT and PFR which indicate that the higher the EI_ACH of a team leader of a construction design team, the lower the performance in terms of efficiency, performance against similar teams and possibility of future relationship. However, the EI_ACH has a weak positive relationship with the PSD. This means that despite a relationship between the variables, the relationship is not statistically significant. Lastly, EI_ACH has no association with the average performance.

The Adaptability (EI_ADA) competence has a weak positive relationship with the performance measures PEF, PQT, PAT and PFR. This means that despite a positive association between the variables, the relationship is not statistically significant and hence the strength of the relationship may not be of any relevance. The result also indicates that leader EI_ADA has a strong positive correlation with PSD which is statistically significant at 95% (τb = .487, p = .023). This means that, the better the team leaders' flexibility in handling change, juggling multiple demands and adapting team members' ideas or approaches, the better the ability of the team to be self-directed. In addition the EI_ADA has a weak positive relationship with the average performance.

The association between Coach and Mentor (EI_CAM) competence of team leaders and performance shows positive relationships with all the performance measures and also with the average performance. However, only the association between the leader EI_CAM and PQT has a statistical significance at 99% (τb = .582, p = .007). This means that, the better the team leaders' ability to foster the long-term learning or development of others as well as help others through emotional or tense situations, tactfully bringing disagreements into the open and finding solutions all can endorse, the better the quality of teamwork in construction design teams.

The association between the Conflict Management (EI_CMT) competences of team leaders shows a weak negative relationship with the performance measures PEF, PSD, and PFR. While the relationship of the EI_CMT with PQT, PAT is a weak positive association. The results also shows a weak positive association with the average performance suggesting that there is no significant relationship between conflict management competence of the leader EI and any of the performance measure and also the average performance. Furthermore the association between Empathy (EI_EMP*)* and all performance measures shows weak positive relationships indicating non-statistically significant positive relationships. This suggest that the ability of a team leader in a construction design team to sense others' feelings and perspectives do not directly translate to team performance.

The association between Emotional Self-Awareness (EI_ESA) competence of team leaders shows a weak positive relationship with the performance measures PSD, PAT and PFR. Which means that despite a positive association between the variables, the relationship is not statistically significant. While, leader EI_ESA has a weak negative correlation with PEF and PQT. Consequently, the association of the EI_ESA has a

positive correlation with the average performance and as such implies that the ability of construction design team leader to understand their emotion does not have significant association with team performance.

The Emotional Self-Control (EI_ESC) competence of team leaders shows a positive relationship with the performance measures, PQT and PSD. Which means that despite a positive association between the variables, the relationship is not statistically significant. The result also indicates that leader EI_ESC have a weak negative correlation with PEF, PAT and PFR. Consequently, the association of the EI_ESC has a positive correlation with the average performance. This implies that the ability of construction design team leader to keep disruptive emotions and impulses in check and maintain effectiveness under stressful or hostile conditions have influence on the overall performance of the team.

The Inspirational leadership (EI_IL) competence of team leaders shows a weak positive relationship with all the performance measures and also with the average performance. Which means that despite a positive association between the variables, the relationship is not statistically significant. This implies that the ability of construction design team leader to inspire and guide the other design team members in getting their job done as well as to bring out their best does not have a significant association with any of the performance attributes measured.

Table 4.7 further shows that the Influence (EI_INF) competence of team leaders has a weak positive relationship with the performance measure PSD. Which means that despite a positive association between the variables, the relationship is not statistically significant. Whereas the association between the leader EI_INF have a weak negative correlation with

PEF, PQT, PAT and PFR measures. Consequently, the association of the EI_INF with the average performance shows a weak negative relationship. This suggest that the ability of construction design team leaders to have a positive impact on the other members through persuasion to gain their support may affect performance negatively.

Also the Organisational Awareness (EI_OA) competence of team leaders do not have influence on any of the performance attributes as revealed by the results. The EI_OA shows a weak positive relationship with the performance measures PEF, PSD, PAT and PFR. Which means that despite a positive association between the variables, the relationship is not statistically significant. The result also indicates that leader EI_OA have a weak negative correlation with PQT indicating no statistical significance. Consequently, the association of the EI_OA with the average performance shows a weak positive relationship. This implies that the ability of construction design team leader to read the team's emotional currents and power relationships, identifying influencers, networks and dynamics may not be significant to performance.

The association between Positive outlook (EI_PO) competences of team leaders shows a weak positive relationship with all the performance measures and also with the average performance. This shows that the team leader's ability to see the positive in people, situations and events and persistence in pursuing goals despite obstacles and setbacks may not be of significance to the performance of a construction design team.

Lastly, the correlational analysis between Teamwork (EI_TW) competence of team leaders with the performance measures shows weak positive relationship with PQT and PSD. While the analysis shows weak negative association with the PEF, PAT and PFR

measures. Consequently, the association of the EI_TW with the average performance shows a weak negative relationship. Weak associations generally depicts a statistically non-significant relationship. Thus the ability of construction design team leaders to work with others toward a shared goal; participating actively, sharing responsibility and rewards and contributing to the capability of the team may not be of significance to the performance of a construction design team. In summary, Table 4.8 highlights the team leader emotional competences that have significant association with team performance.

Table 4.8: Significant Correlations between Leader EI competences and Team Performance

EI Competences	**Performance Measures**
EI_ACH	PQT
EI_ADA	PSD
EI_CAM	PQT , Ave_P
EI_CMT	-
EI_EMP	-
EI_ESA	-
EI_ESC	-
EI_IL	-
EI_INF	-
EI_OA	-
EI_PO	-
EI_TW	-

Of the twelve (12) emotional intelligence competences, only three (3) have significant association with two (2) of the performance attributes. The EI _ACH of the team leader has significant positive association with PQT while the EI_ADA have significant positive association with the PSD measure. EI_CAM has significant positive association with PQT and also with the average performance. The other competences do not have

significant association with any of the performance measures and also with the average performance.

A further analysis was carried out to find out the relationship of the emotional intelligence clusters and total EI of the team leader with performance and the result is presented in Table 4.9.

Table 4.9: Correlation between EI Clusters/Total EI of the Team Leader and Performance Measures.

		PEF	PQT	PSD	PAT	PFR	AVE_P
SA	Correlation Coefficient	-.074	-.095	.220	.065	.166	.093
	Sig. (2-tailed)	.731	.659	.306	.762	.429	.636
SM	Correlation Coefficient	.096	.447*	.544*	.077	-.012	.290
	Sig. (2-tailed)	.658	.039	.012	.723	.955	.142
SoA	Correlation Coefficient	.021	.202	.395	.022	.108	.222
	Sig. (2-tailed)	.922	.350	.068	.919	.610	.262
RM	Correlation Coefficient	-.042	.463*	.342	-.076	-.107	.152
	Sig. (2-tailed)	.844	.031	.111	.724	.611	.439
TOTAL_EI	Correlation Coefficient	.054	.399	.463*	-.011	.024	.259
	Sig. (2-tailed)	.805	.067	.034	.959	.909	.193

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

c. List wise N = 17

The result of the association between EI clusters and performance shows that the self-awareness (SA) and the social awareness (SoA) clusters do not have significant association with all the performance measures and by extension with the average performance. While the self-management (SM) and the relationship management (RM) clusters have significant positive association with at least one (1) performance measure. The SM have significant association with the PQT and PSD measures at 95% (τb = .477,

p = .039) and (τb = .544, p = .012) respectively. The RM cluster have significant association with the PQT measure at 95% (τb = .463, p = .031). Furthermore total EI of the team leader also has a significant association with only the PSD measure at 95% (τb = .463, p = .034). This suggests significant positive association of the SM and RM of the team leader with the team's quality of work.

4.6 Correlational Analysis between Team EI and Performance of Construction Design Teams

To establish the relationship between team emotional intelligence and the performance of the construction design team, Kendall's tau b was carried out between TEI norms and performance, Team emotional intelligence levels/ total TEI and performance. The result of the analysis is presented in Table 4.10 and 4.11 for team norms and team levels respectively.

Table 4.10: Correlation between Team EI Norms and Performance Measures.

		PEF	PQT	PSD	PAT	PFR	AVE_P
TEI_BR	*τb*	.206	.206	.303	.336	.159	.348
	Sig. (2-tailed)	.346	.346	.167	.125	.458	.082
TEI_CA	*τb*	.224	.470*	.481*	.231	.303	.449*
	Sig. (2-tailed)	.317	.036	.032	.303	.167	.028
TEI_CB	*τb*	.465*	.284	.395	.234	.154	.427*
	Sig. (2-tailed)	.040	.210	.081	.301	.488	.038
TEI_CN	*τb*	.163	.391	.340	0.000	-.074	.192
	Sig. (2-tailed)	.457	.074	.121	1.000	.732	.338
TEI_IU	*τb*	.482*	.153	.254	.327	.272	.421*
	Sig. (2-tailed)	.029	.488	.250	.139	.209	.037
TEI_PS	*τb*	.515*	.131	.458*	.271	.297	.483*
	Sig. (2-tailed)	.020	.551	.038	.219	.170	.016
TEI_TE	*τb*	.266	.255	.348	.114	.088	.276
	Sig. (2-tailed)	.229	.249	.117	.606	.687	.173
TEI_UT	*τb*	.386	.290	.324	.155	.157	.361
	Sig. (2-tailed)	.076	.183	.137	.477	.460	.069
TEI_WE	*τb*	.271	.173	.339	.100	-.037	.304
	Sig. (2-tailed)	.217	.429	.122	.647	.864	.129

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

c. List wise N = 17

Again two-tailed Kendall's tau-b correlation was carried out between the nine (9) team emotional intelligence norms and five (5) measures of performance. The results revealed the specific norms that influence team performance. The team performance measured are Team Efficiency (PEF), Quality of Teamwork (PQT), Teams' Ability of Self-Direction (PSD), Performance against Similar Teams (PAT) and Teams' Possible Future Relationship (PFR).

The results shows that; Build External Relationships (TEI_BR) norm of team members have weak positive association with all the five measure of performance; PEF, PQT, PSD, PAT and PFR. Consequently, the association of the TEI_BR with the average performance also is not significant. Thus indicating that the ability of a team to help other teams build positive contact with external constituents, obtain external support and secure

resources do not have do not significantly contribute to team performance in construction design teams studied.

The correlational analysis between the Build Optimism (TEI_CA) norm and all the performance measures revealed a positive association, with two (2) measures having statistical significance at 95%. The two (2) measures with statistical significance are PQT and PSD at 95% (τb = .470, p = .036) and (τb = .481, p = .032) respectively. Also, the association of the TEI_CA with the average performance is significant at 95% (τb = .499, p = .028). Thus indicating that the ability of a team to have positive group affect and optimistic outlook significantly contribute to teamwork quality and team self-direction as well as to the average performance.

Similarly, the analysis showed a positive association between Demonstrate Caring (TEI_CB) norm with all the performance measures with only the PEF measure having statistical significance at 95% (τb = .465, p = .040). In addition the TEI_CB has a significant positive association with the average performance at 95% (τb = .427, p = .038). Thus indicating that the ability of team members to communicate affection, appreciation, and respect with each other contributes significantly to team efficiency and the average performance.

For the Address Unacceptable Behavior (TEI_CN) norm the correlation analysis revealed a positive association with four (4) performance measures and a negative association with PFR performance measure. Consequently the association of TEI_CN with the average performance is positive and non-significant. In essence a team's adherence to rules of conduct as well as pointing out unacceptable conduct is not significant to any performance

measure and may even be a deterrent to the possibility of future relationship (PFR) performance measure.

Furthermore, the analysis between the Understand Team Members (TEI_ IU) and all the performance measures is similar to that of the (TEI_CB) norm with all the performance measures. The result shows positive association with all the performance measures with only the PEF measure having statistical significance at 95% (τb = .482, p = .029). In addition the TEI_IU has a significant positive association with the average performance at 95% (τb = .421, p = .037). Thus indicating that the ability of team members to understand each other's feelings, interests, concerns, strengths and weaknesses contribute significantly to team efficiency, team self-direction and possible future relationship.

The correlational analysis between the Solve Problem Proactively (TEI_PS) norm and all the performance measures revealed a positive association with all the measures with two (2) measures having statistical significance at 95%. The two (2) measures with statistical significance are PEF and PSD at 95% (τb = .515, p = .020) and (τb = .458, p = .038) respectively. Also, the association of the TEI_CA with the average performance is significant at 95% (τb = .483, p = .016). Thus indicating that the ability of a team to anticipate and provide solutions to situations before they occur significantly contribute to team efficiency and team self-direction as well as to the average performance.

The Understand Team Context (TEI_UT), Review the Team (TEI_TE) norms have non-significant positive association with all the performance measures as well as with the average performance. Thus indicating that the ability of team members to understand the socio-political system of the organisation as well as evaluate team activities, including

emotional states, strengths & weaknesses in interaction and operation may not affect any of the performance measures significantly.

Lastly, Support Expression (TEI_WE) norm has positive association with four (4) performance measures and a negative association with the PFR performance measure. Consequently the association of TEI_CN with the average performance is positive and non-significant. Thus indicating that the ability of team members to accept emotions as part of group and encourage expression and examination of feelings is not significant to any performance measure and may even be a deterrent to the possibility of future relationship (PFR) performance measure.

In summary, only four (4) team emotional intelligence norms have positive significant associations with some of the performance measures. The other five (5) TEI norms have non-significant positive association with the exception of TEI_CN and TEI_WE norms which have a negative association with the PFR measure. Thus Table 4.11 shows team emotional intelligence norms that will potentially contribute to the performance measures.

Table 4.11: Significant Correlations between Team Emotional Intelligence norms and Team Performance

TEI Norms	**Performance Measures**
TEI_BR	-
TEI_CA	PQT, PSD and Ave. P
TEI_CB	PEF and Ave. P
TEI_CN	-
TEI_ IU	PEF and Ave. P
TEI_ PS	PEF, PSD and Ave. P
TEI_TE	-
TEI_UT	-
TEI_WE	-

The significant associations of the team emotional intelligence norms with the performance measures shows that only Four (4) TEI norms are significant in predicting performance of Construction Design Teams. The performance measures predicted by the TEI norms are the quality of work (PQT), efficiency in getting things done (PEF) and the ability of the team to be self-directed (PSD). PQT is relevant to the TEI_CA norm only while PEF is relevant to TEI_CB, TEI_IU and TEI_ PS. Whereas none of the team EI norms have significant associations with the PAT and PFR measures, all the four (4) norms have significant association with the average performance.

Kendall's Tau-*b* correlation was carried out to further find out the relationship between the TEI levels and total TEI with performance, and the result is presented in Table 4.12.

Table 4.12: Correlation between TEI Levels/Total TEI and Performance Measures

		PEF	PQT	PSD	PAT	PFR	AVE_P
IND	Correlation Coefficient	.374	.342	.409	.264	.133	.420*
	Sig. (2-tailed)	.085	.115	.059	.223	.533	.034
GRP	Correlation Coefficient	.309	.234	.408	.154	.096	.333
	Sig. (2-tailed)	.153	.279	.059	.478	.650	.092
CRB	Correlation Coefficient	.312	.322	.326	.246	.153	.367
	Sig. (2-tailed)	.142	.129	.125	.247	.464	.059
T0TAL_TEI	Correlation Coefficient	.351	.362	.432*	.219	.072	.401*
	Sig. (2-tailed)	.105	.094	.046	.311	.734	.042

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

c. List wise N = 17

The result shows that all the associations between TEI levels and all performance measures have non-significant positive relationship except the association of the individual (IND) level with the average performance, which is significant at 95% (τb = 0.420, p = .034). Furthermore, total TEI has significant positive association with the PSD measure and average performance at 95% (τb = .432, p = .046) and (τb = 0.401, p = .042) respectively. The τb values in all the significant associations shows a moderate strength of association.

4.7 Association of TEI norms with Group Fundamentals (GF) and Social Capital (SC)

The theory of team emotional intelligence as conceptualised by Druskat and Wolff (2002) include team social capital and group fundamentals. This is because Social Capital constitutes some aspect of the social structure, and also facilitates interactions that lead to desirable outcomes (Nahapiet & Ghoshal, 1998). Team emotional intelligence norms predict the Group Fundamentals and Social Capital in a group. Thus a correlational analysis was carried out to find out the relationship between the social capital / Group Fundamental and team EI. Table 4.13 shows the result of the analysis.

Table 4.13: Correlational Analysis between Team EI Norms and Group Fundamentalsand Social Capital

		GF-GO	GF-MP	GF-RR	SC-CD	SC-IN	SC-SRT	SC-TI
TEI_BR	Correlation Coefficient	.611**	.142	.393*	.600**	.427*	.494*	.594**
	Sig. (2-tailed)	.002	.466	.047	.002	.028	.011	.003
TEI_CA	Correlation Coefficient	.647**	.249	.388	.721**	.500*	.664**	.621**
	Sig. (2-tailed)	.001	.209	.055	.000	.012	.001	.003
TEI_CB	Correlation Coefficient	.620**	.426*	.366	.792**	.708**	.813**	.545**
	Sig. (2-tailed)	.002	.033	.073	.000	.000	.000	.009
TEI_CN	Correlation Coefficient	.427*	.225	.342	.683**	.452*	.720**	.594**
	Sig. (2-tailed)	.029	.248	.084	.000	.020	.000	.003
TEI_IU	Correlation Coefficient	.624**	.538**	.578**	.513**	.515**	.549**	.436*
	Sig. (2-tailed)	.001	.006	.004	.009	.009	.005	.033
TEI_PS	Correlation Coefficient	.793**	.445*	.517**	.681**	.557**	.633**	.508*
	Sig. (2-tailed)	.000	.023	.009	.001	.004	.001	.013
TEI_TE	Correlation Coefficient	.470*	.255	.358	.732**	.513**	.718**	.524*
	Sig. (2-tailed)	.017	.194	.073	.000	.009	.000	.011
TEI_UT	Correlation Coefficient	.628**	.346	.448*	.519**	.562**	.554**	.525**
	Sig. (2-tailed)	.001	.074	.023	.007	.004	.004	.009
TEI_WE	Correlation Coefficient	.467*	.149	.213	.664**	.442*	.742**	.538**
	Sig. (2-tailed)	.017	.442	.281	.001	.023	.000	.008

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

c. List wise N = 17

The result of the two-tailed Kendall's tau-b correlation between team emotional intelligence norms and group fundamentals/ social capital of teams shows positive associations between team emotional intelligence norms and the Group Fundamentals(GF)/ social capital (SC) of the construction design teams. However not all of the associations are of statistical significance as indicated by the *p* values. Details of the association of relevance are thus:

The Understand Team Members (TEI_IU) and Solve Problem Proactively (TEI_PS) norms have significant association with all the Group Fundamentalsand Social Capital attributes at varying significance levels. The TEI_IU has significance at 99% for all the attributes with the exception of the Team identity (SC_TI) attribute at 95% significance while the TEI_PS have two significance levels at 95% for the Meeting procedures (GF_MP) and Team identity (SC_TI) attributes.

The result further shows that three (3) norms have significant associations with two (2) Group Fundamentals attributes and all the Social capital attributes. The Build External Relationships (TEI_BR) and the Understand Team Context (TEI_UT) norms are relevant to predicting the Goal and Objectives (GF_GO) and Roles and Responsibilities (GF_RR) attributes. While the Demonstrate Caring (TEI_CB) norm has significant association with the GF-GO and the GF-MP attributes. Again these significant associations have varying levels of significance. The TEI_BR have a 99% significance with the GF_GO, Creating Debate (SC-CD) and the SC-TI and at 95% significance with the GF_RR, Innovation (SC_IN) and Safety and Risk Taking (SC-SRT) attributes. While all the significant associations of the TEI_UT norm are at 99% significance level with the exception of the GF_RR attribute which is at 95% significance. Also all the significant associations of the TEI_CB norm are at 99% significance level with the exception of the GF_MP attribute which is at 95% significance.

Lastly, four (4) TEI norms have significant association with only the GF_GO attribute of the Group Fundamentals and with all the Social Capital attributes. These norms are the Address Unacceptable Behavior (TEI_CN), Support Expression (TEI_WE), Build Optimism (TEI_CA) and the Review the Team (TEI_TE) norms. The significance levels

of the associations of GF_GO are at 99% for TEI_CA norms and 95% for the TEI_CN, TEI_TE and TEI_ WE norms. Also the significance levels of the SC attributes are at 99% for TEI_CA, TEI_CN and TEI_ WE with the SC_CD, SC_SRT and SC_TI and 95% for the SC_IN attribute. While the TEI_TE norm is significant with the SC_CD, SC_IN and SC- SRT at 99% and with SC_TI at 95%.

In summary, all team emotional intelligence norms have significant positive association with all the Social Capital attributes and the Goals and Objectives attribute of the Group fundamentals. Furthermore, Kendall's Tau-*b* correlation was carried out to further find out the relationship between the total Group Fundamentals and Social Capital with all the team emotional intelligence levels /Total EI; the result is presented in Table 4.14.

Table 4.14: Correlational Analysis between TEI Levels and Group Fundamentals/Social Capital

		AVE_GF	**AVE_SC**
IND	Correlation Coefficient	.610**	.709**
	Sig. (2-tailed)	.001	.000
GRP	Correlation Coefficient	.506**	.698**
	Sig. (2-tailed)	.007	.000
CRB	Correlation Coefficient	.586**	.559**
	Sig. (2-tailed)	.001	.002
T0TAL_TEI	Correlation Coefficient	.537**	.722**
	Sig. (2-tailed)	.004	.000

**. Correlation is significant at the 0.01 level (2-tailed).
c. List wise N = 17

The result shows that all the association between all levels of team emotional intelligence Individual (IND), Group, (GRP) and Cross-Boundary (CRB)) and Group Fundamentalsare positive and significant at 99%. Likewise for the association between

all the TEI levels and the Social Capital. Thus, the association between the total team emotional levels with the Group Fundamental and Social Capital are all positve and significant at 99%.

4.8 Influence of team Leader EI on Team EI in Construction Design Teams

Literature has suggested that a leader's emotional intelligence influences the emotinal intelligence of subordinates and teams as well. Thus an analysis was carried out to find out the nature of the relationship of team leaders' emotional intelligence and the emotional intelligence of construction design teams. The result of the analysis is shown in Table 4.15.

Table 4.15: Correlation between Team Leader EI and Team EI Norms

		TEI_BR	TEI_CA	TEI_CB	TEI_CN	TEI_IU	TEI_PS	TEI_TE	TEI_UT	TEI_WE
EI_ACH	*τb*	.474*	.464*	.336	.659**	.275	.389*	.517**	.508**	.456*
	p	.013	.017	.086	.001	.150	.042	.007	.007	.016
EI_ADA	*τb*	.542**	.435*	.350	.383*	.306	.354	.269	.299	.341
	p	.004	.024	.072	.043	.108	.063	.159	.111	.071
EI_CAM	*τb*	.598**	.701**	.513**	.590**	.397*	.529**	.578**	.534**	.514**
	p	.002	.000	.009	.002	.040	.006	.003	.005	.007
EI_CMT	*τb*	.264	-.026	.060	.149	.442*	.142	.008	.253	.016
	p	.171	.897	.762	.442	.023	.466	.966	.188	.932
EI_EMP	*τb*	.571**	.621**	.445*	.571**	.357	.397*	.451*	.397*	.408*
	p	.003	.001	.023	.003	.063	.038	.019	.035	.032
EI_ESA	*τb*	.360	.231	.292	.216	.234	.331	.245	.150	.279
	p	.057	.232	.134	.254	.220	.082	.200	.425	.141
EI_ESC	*τb*	.096	.315	.336	.426*	.227	.259	.246	.214	.336
	p	.612	.105	.086	.025	.236	.175	.200	.256	.077
EI_IL	*τb*	.227	.200	.085	.227	.294	.237	.074	.232	.145
	p	.235	.304	.667	.235	.127	.218	.700	.222	.447
EI_INF	*τb*	.282	.291	.168	.008	-.089	.016	.124	-.040	.032
	p	.138	.134	.391	.966	.641	.932	.521	.833	.866
EI_OA	*τb*	.233	.008	.117	.121	.324	.332	-.066	.254	.144
	p	.220	.966	.548	.526	.090	.082	.732	.178	.448
EI_PO	*τb*	.415*	.402*	.450*	.268	.369	.443*	.249	.169	.356
	p	.030	.040	.023	.161	.056	.022	.198	.375	.063
EI_TW	*τb*	.183	.309	.183	.308	.067	.092	.247	.156	.207
	p	.346	.119	.362	.113	.731	.636	.209	.418	.286

τb: Kendell's Tau b Correlation Coefficient; *p:* Sig. (2-tailed)

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

c. List wise N = 17

Two-tailed Kendall's tau-b correlation was run to determine the relationship between twelve (12) EI competences of team leaders and team emotional intelligence norms. The result shows that majority of the associations are positive with the exception of the associations of Conflict Management (EI_CMT) competence with Build Optimism (TEI_CA) norm, Influence (EI_INF) competence with Understand Team Members (TEI_IU) and Understand Team Context (TEI_UT) norms and Organisational Awareness (EI_OA) competence with the Review Team (TEI_TE) norm which are negative and non-significant.

The result shows that seven (7) emotional intelligence competences have significant positive relationship with at least one (1) of the team emotional norms. The Coach and mentor (EI_CAM) EI of the team leader has positive associations at 99% significance with all the team emotional intelligence norms except with the TEI_IU norm which is at 95% significance. The result also shows that the Empathy (EI_EMP) competence of the team leader have significant associations with eight (8) of the team emotional norms. Three (3) of the significant associations are at 99% while the other five (5) are at 95%. The association between the EI_EMP with Build External Relationships (TEI_BR), Build Optimism (TEI_CA) and Address Unacceptable Behavior (TEI_CN) are at 99% significance while the association between the EI_EMP with Demonstrate Caring (TEI_CB), Solve Problem Proactively (TEI_PS), Understand Team Context (TEI_UT), Review the Team (TEI_TE) and Support Expression (TEI_WE) are significant at 95%.

The Achievement Orientation (EI_ACH*)* competence of the team leader has significant associations with seven (7) of the team emotional intelligence norms. Three (3) of the significant associations are at 99% while the other four (4) are at 95%. The association between the EI_ACH with Address Unacceptable Behavior (TEI_CN), Understand Team

Context (TEI_UT) and Review the Team (TEI_TE) are at 99% significance while the association between the EI_ACH with Build External Relationships (TEI_BR), Build Optimism (TEI_CA), Solve Problem Proactively (TEI_PS), and Support Expression (TEI_WE) are significant at 95%. Again the association between Positive outlook (EI_PO) competences of the team leaders have significant positive associations with four (4) team emotional intelligence norms which are Build External Relationships (TEI_BR), Build Optimism (TEI_CA) Demonstrate Caring (TEI_CB) and Solve Problem Proactively (TEI_PS). All the four significant associations are at 95%.

Furthermore, the results shows that the Adaptability (EI_ADA) leader competence has significant associations with Build External Relationships (TEI_BR), Build Optimism (TEI_CA) at 99% and Build Optimism (TEI_CA) at 95%. In addition, the Conflict management (EI_CMT) and the Emotional Self-Control (EI_ESC) leader competences have significant association with only (1) team emotional intelligence norm at 95%. The EI_CMT have a significant positive association with the Understand Team Members (TEI_IU) norm while the EI_ESC have significant association with the Address Unacceptable Behavior (TEI_CN) norm.

Five (5) of the Leader EI competences do not have significant associations with any of the nine (9) team emotional intelligence norms. The competences are the Emotional Self-Awareness (EI_ESA), Inspirational leadership (EI_IL), Influence (EI_INF), Organisational Awareness (EI_OA) and the Teamwork (EI_TW).

Drawing inferences from the results of the correlation between leader EI competences and team emotional intelligence norms of the construction design team indicates that there are relationships of significance between the two variables. These relationships are

highlighted in Table 4.14 showing both the positive and negative association of signifance.

Table 4.16: Significant Correlations between Team Leader EI and TEI Norms of Construction Design Teams

EI Competences	Positive Influence on TEI
EI_ACH	BR, CA, CN, PS, TE, UT and WE
EI_ADA	BR, CA and CN
EI_CAM	BR, CA, CB, CN, IU, PS, TE, UT and WE
EI_CMT	IU
EI_EMP	BR, CA, CB, CN, PS, TE, UT and WE
EI_ESA	-
EI_ESC	CN
EI_IL	-
EI_INF	-
EI_OA	-
EI_PO	BR, CA, CB and PS
EI_TW	-

The results shows that Seven (7) team leader EI competences significantly correlate with at least one TEI norm. Build External Relationships (TEI_BR) and Build Optimism (TEI_CA) have potentials to be influenced by the five (5) Leader EI competences (EI_ACH, EI_ADA, EI_CAM, EI_EMP and EI_PO). The results also shows that the Demonstrate Caring (TEI_CB) can potentially be influenced by three (3) leader EI (EI_CAM, EI_EMP and EI_PO) competences. While Address Unacceptable Behavior (TEI_CN) can potentially be influenced by the EI_ACH, EI_ADA, EI_CAM, EI_EMP and EI_ESC leader EI competences.

Understand Team Members (TEI_ IU) norm has potentials to be influenced by EI_CAM and EI_CMT. Also Solve Problem Proactively (TEI_ PS) norm can potentially be

influenced by EI_ACH, EI_CAM and EI_EMP leader EI competences. Lastly, the Review the Team (TEI_TE), Support Expression (TEI_WE) and Understand Team Context (TEI_UT) can potentially be influenced by EI_ACH, EI_CAM and the EI_EMP leader competences.

Furthermore, Kendall's Tau-*b* correlation was carried out to investigate the relationship between the EI clusters/Total EI and TEI Levels/Total TEI; the result is presented in Table 4.17.

Table 4.17: Correlation between EI Clusters/Total EI and TEI Levels/Total TEI.

		IND	**GRP**	**CRB**	**TOTAL_TEI**
SA	Correlation Coefficient	.213	.329	.207	.196
	Sig. (2-tailed)	.257	.078	.261	.295
SM	Correlation Coefficient	.534**	.492**	.582**	.587**
	Sig. (2-tailed)	.005	.009	.002	.002
SoA	Correlation Coefficient	.319	.373*	.380*	.365
	Sig. (2-tailed)	.092	.048	.041	.053
RM	Correlation Coefficient	.504**	.424*	.544**	.549**
	Sig. (2-tailed)	.007	.024	.003	.003
TOTAL_EI	Correlation Coefficient	.508**	.506**	.510**	.546**
	Sig. (2-tailed)	.008	.008	.006	.004

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
c. List wise N = 17

The result shows the association between EI clusters and TEI levels as positive with the Self-Awareness (SA) cluster of the leader EI having non- significant correlation with all

the TEI levels and total TEI. While the Self-Management (SM) and the Relationship Management (RM) clusters have significant association with all the TEI levels and Total TEI. The Social Awareness (SoA) cluster have significant association with the Group (GRP) and Cross-Boundary (CRB) TEI levels. Furthermore total EI of the team leader has significant association with all the TEI levels as well as the Total TEI. All significant associations are at 99%.

4.8 Analysis of Focus Group Interview

All the four (4) teams were contacted for a focus group interactions, but only team B members gave positive response in regards to their availability for the interaction. Thus, the focus group interaction was conducted with three (3) Persons from team B: the team leader and two (2) members. Consent was sought to record the discussion which lasted for 96 mins. The recorded discussion was later transcribed and analysed using content analysis to identify relevant themes. The discussions were based on the results obtained from the survey and also other similar projects experiences not considered in the questionnaire. The result is presented as follows:

4.8.1 Team leader EI

I. Studies such as Cole *et al*., 2016; Hobbs and Smyth, 2012 have shown that the team leader EI affects the team performance. Also construction design teams are known to be self-directed; does the project manager (PM) for this team take the full responsibility of a leader or did any member assume the PM's role? The responses are as follows:

   The team members agreed that the team leader was fully committed to his responsibility as a leader. In addition, one team member reported that the team

leader placed a great demand at the beginning and also put in extra-effort to coordinate the team. This shows great commitment to responsibility.

The team leader was asked the reasons for the commitment to which he responded that the drive for the success of the project because of personal interest as an end-user of the project and particularly that the client was biased towards the projects. He further mentioned that despite challenges encountered, the loyalty was majorly the drive to go beyond the required expectation. In summary, the team leader for the project took full responsibility and showed commitments leading to a successful performance.

II. How does the emotional intelligence of the leader (PM) of this team compare to other team leaders you have worked with?

Comparing the team leader EI with other team leaders, the team members responded that the team leader demonstrated a greater management of emotions as compared to other team leaders which team members were part because:

a) The team leader gave opportunity to team members to discuss and resolve conflicts/challenges within the team without necessarily involving other parties such as superiors and the client as such showing empathy to all team members.

b) He was able to manage emotions within the team even when a member acted in such a way as to contradict the team's position, this led to a continued relationship even outside of work environment as well as after the completion of the project.

c) The team leader was able to manage challenging situations to provide solutions agreeable to the parties concerned thus building trust.

d) The team leader is good at figuring out the emotions of others as compared to other team leaders.

e) The team leader had an open communication policy which allowed for free flow of information and he kept team members updated on the progress of work at all times. The use of communication tools such as WhatsApp, calls, SMS and emails was at an optimum and each one was carried along.

In summary, the results suggest that the leader's commitment, conflict resolution and empathy skills shows his level of emotional competence and thus will ensure the loyalty and trust of the team members. This will in turn promote better performance.

III. Will the EI of the leader change with a different constitution of team members?

All the members responded that the team leader EI will be consistent because he will be able to act rightly to achieve the desired result. However, if there is no full cooperation from the members, the influence of the leader EI on team members as well as the performance would be minimal.

4.8.2 Team emotional intelligence

I. Research has shown that the team leader EI affects the team emotional intelligence norms and by extension the team performance; do you think that the emotional intelligence of the team leader is responsible for the team emotional intelligence norms? What are the reasons for your responses?

The members responded that the team leader EI reflects on the team members. This result from the ability of the leader in discharging his duty of coordination as well as moderating the activities of the team. On the other hand, if the team leader

does not make effort to coordinate and moderate team activities, the team demonstrate poor team emotional norms which will lead to less desirable performance.

Also, the trust the team members have in the team leader to treat them all fairly will enable formation of team emotional norms.

II. Will the team EI be the same without a leader? Please provide reasons for the response given.

All the members responded that the team EI will not be the same without the team leader because:

i. The leader is a vital part of the team whose main role is to carry along every member within the team. Hence without the leader the team will not have a direction thus leading to chaos.

ii. More adversarial relationships will exist as there will not be a person whose major responsibility is to moderate the activities within the team.

III. Will the findings on TEI also be true for other teams you have participated and why?

The members responded that the team norms are not same for other teams they have participated because of leadership and commitment issues. While another member said that “the first time working together as a team will be difficult for team members to demonstrate team norms but with participation in more projects team norms will be improved”.

IV. Results from the questionnaire survey showed that two (2) team norms were the least scored norms, interviewees were asked to further substantiate result with possible explanation. The responses are as follows:

a. ***Review the team:*** All the members responded that team evaluation (Review Team) is not done formally but rather subconsciously as members review activities in previous teams they have participated in to judge the possibility of a future relationship both formally and informally as a form of reviewing previous team activities.

b. ***Support expression***: this is also not done formally but informally as there are situations in which members have met with their leaders to draw their attention to how they react to situations. This helps in correcting emotional outbursts and makes members to be more aware and manage their emotions as well as being more aware of others' emotions.

4.8.3 Team performance

I. In your opinion, which is of greater influence on team performance between the team leader EI and Team EI? State reasons for your response.

One member responded that the leader EI can be said to be 100% responsible for the team performance because the leader is the focal point of the group. While the other two are of the opinion that both team leader EI and team EI contribute to the team performance with the leader EI as the major contributory factor. However, the leader can only be of influence when the team members demonstrate ability to develop team norms.

II. Will a team's performance change if the leader is changed?

All the interviewees responded in affirmation. The reason being that each individual has different EI abilities. However, if the new leader has similar or even higher EI capacity than the previous leader, the team performance will be the same or higher.

III. How is the performance of this team compared to other similar teams in which you have participated?

All members agreed that despite the various challenges inherent with the projects in question the performance is better than most projects they have participated in. This can be attributed to the team leader's EI ability to influence the team emotional norms of the team. The team members were further asked if they will want to work together in future projects to which they replied in the affirmative. Furthermore, they added that even with same membership they would not want to work for certain clients. This shows that the possibility of a future relationship with other team members does not only depend on the team but also the client.

4.9 Discussion of Results

4.9.1 Team leader emotional intelligence

The result presented in Tables 4.3 and 4.4 showed the leader emotional intelligence and team emotional intelligence respectively which was interpreted based on the classification stated in the ESCI technical manual. However, the popular classification of likert scale scores for 5-point Likert items scored developed and interpreted by Ruikar et al. (2006) for the construction industry which was further applied. This is necessary as it is a more applied rating tailored for construction related studies. The scale classification is; Low

(1.00 < x < 2.50), Moderate (2.50 < x < 3.50) and High (3.50 < x < 5.00) to be termed as Below Average, Average and Above Average respectively in this study. Thus the scores demonstrated by all the team leaders can be said to be above average even though in some instances they are yet to attain strength that is having a score of 4.3 or above, thereby requiring improvement.

The profile of the teams showed that teams A and B belong to multi-disciplinary firms while teams C and D were drawn from different firms to form the design team. The results showed that team leaders from the multi-disciplinary firm demonstrated higher emotional intelligence than the leaders of the inter-disciplinary firms. This may be bacause they belong to the same organisation and have already established culture (norms). The highest scored competences in all the teams are the Teamwork and Emotional Self-Control competences while the least scored competence across all teams is the Emotional Self-Awareness. In essence the emotional intelligence is a valuable tool to further comprehend relationships in the construction design teams and the whole industry at large.

Boyatzis *et al.* (2017) established that an individual who demonstrates strength in Emotional Self Awareness is also likely to demonstrate an average of 10 ESCI competences consistently (ESCI strengths). Thus, the results showed both conformity and divergence with Boyatzis *et al.* (2017) finding. The results for teams A, C and D conforms to the finding while the result for team B did not as the leader demonstrated strength in Ten (10) competences yet the Emotional Self Awareness competence is not a strength.

Contrary to the general belief that the construction industry is characterised by adversarial relationships, the results shows a considerable high scores for the Empathy competence in the four groups thus indicating that this may not necessarily be true as the ability to be empathic shows concern rather than a tendency towards adversrial attitude. Furthermore, the scores for the Emotional Self- Control competence for the teams indicate that team leaders keep disruptive emotions and impulses in check and maintain one's effectiveness under stressful or hostile conditions. This is contratry to Mischung *et al.* (2015a) findings that the constructuion industry is characterised by emotional outbourst which is triggered by stressful working conditions. In addition, the focus group intercation also reaveled that emotional outburst rarely occur thus buttressing the finding from the questionnairre survey.

4.9.2 Team emotional intelligence

The results for the Team EI is similar to the result of the leader EI in terms of team formation where teams A and B demonstrated higher team emotional intelligence than the teams C and D. In addition the result of the focus group discussion also buttresses that team members working for the first time are less likely to demonstrate strength in team emotional norms but with consistent participation in more projects team norms will be improved. Furthermore, the difference in the levels of team emotional intelligence perharps is due to the teams A and B members having higher non-formal interractions and longer duration of interraction despite having participated in fewer teams than teams C and D members. This shows that the type of team formation and interaction as well as duration of interaction affect the formation of team norms and team emotional intelligence; this confirms with the findings of Wolff (2006) as stated in the GEC technical manual. Thus, teams from a multidisciplinary firms are more likely to build

team emotional intelligence norms to a higher level than teams that have members coming from seperate firms.

Table 4.4 shows that for all the teams, the highest scored TEI norms are Solve Problem Proactively, Demonstrate caring and Building Optimism . This indicates that design team members tend to identify and address potential problems implying that they see themselves as a team with a common goal contrary to previous research findings. While the Demonstrate Caring and Build Optimism norms show that team members treat themselves with respect, support each other, seek each others perspective, and validate each others efforts as well as stay positive thus showing a good relationship amongst themselves. However this finding also does not confirm with the general assertion of the existence of adversarial realtionship in the construction industry (Emmit and Gorse, 2003). These norms were formed as a result of trust that the team members have in the team leader to treat all members fairly as reported by members of team B during the focus group interaction.

The least scored competences are Review the Team and Support Expression. The result on Review the Team norm shows that construction teams do not evaluate the team outcomes but perharps their individual performance. This suggests that the basis for evualaution is yet to be at team level. This perharps is as a result of the traditional method of evaluation as prominent in the construction industry particularly at the prequalification stage (Senaratne and Gunawardane, 2015). However, the result from the focus group interaction suggests that team evaluation is not done formally but rather subconsciously as members review activities in previous teams they have participated in to judge the

possibility of a future relationship both formally and informally as such leading to a lesser score.

The Support Expression norm scores indicates that teams do not support emotional expression and responses consistently to be recognised as strength. This buttresses the findings of Mischung *et al.* (2015) that the construction industry asssociate emotional issues with feminism being that the construction industry is considered masculine. However, the results from the focus group interaction suggest that members do provide such resources for emotional expression informally leading to lesser scores than the other norms.

Furthermore, the result from Table 4.4 and 4.5 confirms the theory of Wolff and Druskat (2002) that TEI norms predicts the Group Fundamentals and Social Capital of a group. In addition, the CDTs have exhibited team identity to a good extent as indicated by the scores. This suggests that the CDT members have a sense of belonging to the team as opposed to the general belief that each member sees one another as an individual from separate organisations. The near perfect score of 4.9 by team A for the team identity is perhaps due to the team members belonging to the same organisation as Emmitt (2010) reported that interdisciplinary teams have difficulty to align to the goal of the team . This shows that team identity can be improved when team members belong to the same organisation. Also, all the cases have above average scores in total TEI and TEI levels. This suggests that although, TEI requires improvement to an optimal level.

4.9.3 Team performance

The performance scores as shown in Table 4.5 shows a similar results with that of leader emotional intelligence and team emotional intelligence given that the performance of the teams from the multi-disciplinary firms is better than that of the teams having members

from seperate organisations. All the measures of the performace have similar patterns with the exception of the measure of performance against similar teams which was the lowest for teams A, B and D but the highest for team C. This finding also corroborate the finding from this study on Review the Team norm having the least score from the results. This can be attributed to the absence of a formal approach for team evaluation which will serve as a basis for comparison.

The total performance scores shows that teams studied are yet to reach the best performance especicially in teams where members come from separate firms. This confirms the finding of Ahmad (2019) that performance in the construction industry requires improvement.

4.9.4 relationship between team leader ei and the performance of construction design teams

A multi- level examination of the relationship between team leader EI and performance was established and the results presented in Tables 4.7, 4.8 and 4.9. Table 4.7 showing the results for all the associations of the twelve (12) EI competences of the team leader with the five (5) performance measures. The significant associations were presented in Table 4.8 which shows only three (3) team leader EI competences have significant association with two (2) of the performance attributes. The EI _ACH of the team leader has significant positive association with PQT. While the EI_ADA has significant positive association with the PSD measure. EI_CAM has significant positive association with PQT and also with the average performance. While all the other competences do not have significant association with any of the performance measures and also with the average performance. The positive associations of leader EI Adaptability competence with quality

and self-direction performance implies that, the adaptability competence of a team leader contributes positively to the team performance in terms of team's self-direction. However the Achievement Orientation and the Coach and Mentor competences are significant to the quality of the teamwork.

Furthermore, the absence of any significant association between all the twelve (12) EI competences with the performance against similar teams measure, further confirms that teams in construction are fragmented in nature and each professional is evaluated as an individual competent unit (Baiden *et al.* 2006). Also the absence of any significant association between the all the twelve (12) EI competences with possibility of future relationship suggest that, EI competences of the leader are not the only significant factors for predicting future relationships with members as indicated by the result of the interview where by members willing to work in the future consider other factors such as the Client.

Further analysis of the association between all emotional intelligence clusters and performance as shown in Table 4.9 shows significant positive association of the SM and RM of the team leader with the team's quality of work. In addition to the significant association with the team's quality of work the SM cluster is also significantly associated with the team's self-direction. Consequently, total EI have a significant association with only the team's self-direction suggesting that for construction design teams the leader EI may not contribute significantly to team performance. This is contrary to the findings of Stubbs (2005) and that of Heuvel (2019) where leader's EI is of major significance to team performance.

4.9.5 Relationship between TEIand the performance in construction design teams

Also a multi-level association of the relationship between Team Emotional Intelligence was established and the results were presented in Tables 4.10, 4.11 and 4.12. The significant association of the nine (9) team emotional intelligence norms with performance is shown in Table 4.10 which shows that four (4) of the TEI norms predicts three (3) performance measures. These measures are the quality of work (PQT), efficiency in getting things done (PEF) and the ability of the team to be self-directed (PSD) as well as the Average performance. This can be compared with the result from Koman and Wolff (2008) that establishes a relationship between TEI norms and team performance in military teams. Build Optimism (TEI_CA) norm is significant in predicting PQT, Demonstrate Caring (TEI_CB), Understand Team Members (TEI_IU) and Solve Problem Proactively (TEI_ PS) are significant to predicting Efficiency of construction design teams while none of the team EI norms have significance with the Performance against other teams (PAT) and Possibility of Future Relationship (PFR) measures. The result of Build Optimism, Demonstrate Caring and Understand Team Members norms with efficiency shows that empathy is shown amongst the construction design team members as against the popular belief of the existence of adversarial relationship in the industry (Humphreys, Matthews, Kumaraswamy, 2003).

The result of the the association between TEI levels and performance as presented in Table 4.11 shows non-significant positive relationships except the association of the individual (IND) level with the average performance. This implies that a team's Self-direction is influenced by individual level TEI. Furthermore, total TEI have significant positive association with the PSD measure and average (overall) performance suggesting that for construction design teams the TEI may contribute significantly to team

performance. This provides further evidence to the importance of team emotional intelligence in construction design teams to have a greater influence than the team leader EI. This is contrary to what is obtainable in the military setting where the leader EI is more significant to team performance (Stubbs, 2005). In addition, the result of the content analysis shows that the trust and loyalty that construction design team members have on the team leader better enhances the development of team norms.

4.9.5.1 Relationship between team emotional intelligence and group fundamentals

The Demonstrate Caring (TEI_CB) Understand team members (TEI_IU), Understand Team Context (TEI_UT) and Solve Problem Proactively (TEI_PS) norms are relevant in predicting all the Group Fundamentals attributes. These four (4) TEI norms were also found to be relevant to some of the performance measures. However, the support expression (TEI_WE) norm is relevant in predicting only the Goal and Objectives (GF_GO) attribute. While the Build External Relationships (TEI_BR), Build Optimism (TEI_CA) and Review the Team (TEI_TE) norms are relevant in predicting the GF_GO in addition to the Roles and responsibility (GF_RR) attributes and by extension to team performance. Thus confirming the findings of Svalestuen et al. (2015) that "identifying the design team member's role" is one of the most important indicators of team performance. However, Senaratne and Gunawardane (2015) pointed out that design teams in the construction industry were mainly formed based on the functional roles rather than team roles.

Furthermore, the result in Table 4.17 shows that all the all team emotional intelligence levels are relevant to the Group Fundamentals of the group implying that TEI levels as

well as the total team emotional intelligence will potentially predict the GF in construction design teams and by extension the team performance. This finding also supports the assertion of Druskatt and Wolff (2008) and other researchers on the positive association between TEI norms and Group Fundamentals.

4.9.5.2 Relationship between team emotional intelligence and social capital

All associations between team emotional intelligence norms have significant positive relationship with all the Social Capital attributes therefore indicating that all the TEI norms are relevant in depicting all the SC attributes of the group. Similarly, all team emotional intelligence levels (IND, GRP and CRB) as well as the total TEI are relevant to all the Social Capital which is characterised by Safety and Risk Taking (SC_SRT), Team Identity (SC_TI), Innovation (SC_IN) and Creating debate (SC_CD). Thus supporting the assertion of Druskatt and Wolff (2008) and other researchers on the positive association between TEI norms and Group Fundamentals.

4.9.6 Relationship between team leader EI and team EI

The results shows that Seven (7) team leader EI competences significantly correlate with at least one TEI norm. The Achievement Orientation (EI_ACH) have potentials to predict all the TEI norms with the exception of the Demonstrate Caring Behaviour (TEI_CB) and the Understand Team Members (TEI_ IU) norms. The result of the interview also confirms this findings by members that the EI_ACH of the team leader motivated team members thereby influencing them to act positively towards the group. This also corroborates Stubbs (2005) finding that team leader EI influences the formation of team norms.

Similarly, the Adaptability (EI_ADA) competence of the team leader however is significantly associated with only the Build External Relationships (TEI_BR), Address Unacceptable Behavior (TEI_CN) and Build Optimism (TEI_CA) norms. This shows that the more adaptable a leader is to situations, the better the group norms in terms of the three mentioned norms. While the Coach and Mentor (EI_CAM) competence of the leader is likely to affect all the TEI norms.

Furthermore, the coach and Mentor (EI_CMT) competence is likely to affect only the Understand Team Members (TEI_ IU) norm in that the ability of the team leader to manage conflict shows that he comprehends the situation and settle team members in a way that they understand each other's point of view. On the other hand, the Empathy (EI_EMP) competence of the team leader has the potential to have effect on all the TEI norms except the TEI_IU. However, EI_EMP does not have significant association with any of the performance measure thus suggesting that the EI_EMP may not directly affect team performance but affects TEI norms which in turn influences performance. This findings corroborates with that of Butler and Chinowsky (2006) where he emphasized that empathy is one of the key EI behaviors needed by construction industry executives.

The Emotional Self-Control (EI_ESC) competence of the team leader has potentials to influence only the TEI_CN norm. This finding however is contratry to Mischung et al. (2015a) findings that the constructuion industry is characterised by emotional outbourst. Thus the ability of the team leader to control emotions will lead to effective management of misconduct in a team. The Positive Outlook (EI_PO) competence of the team leader has potentials to influence the TEI_BR, TEI_CA, TEI_CB and TEI_PS norms. This finding also shows that team leaders of construction design teams play vital roles in

building trust amongst team members as shown in the results from the interview. In addition, the existence of adversarial relationships popularised in construction needs to be contextualised properly as this study has establish the existence of considerable amount of understanding among team members of construction design teams.

The result of the association between EI clusters and TEI levels shows that the self-awareness (SA) cluster of the leader EI has non- significant positive correlation with all the TEI levels and total TEI. However, Pryke et al. (2015) found that emotionally intelligent project managers could enhance project teamwork through placing emphasis on emotional self-awareness. The findings for the self-management (SM), social awareness (SoA) clusters and the relationship management (RM) clusters have positive association with the TEI levels and Total TEI. The SoA is likely to predict the GRP and CRB of teams as well as the TEI. While the SM and RM clusters have significant association with all TEI levels as well as the Total TEI. This is similar to the findings of Pryke et al. (2015) that project teamwork can be enhanced by placing emphasis on the SM of project managers. Thus implying that the SM and RM of the leader in a construction design team is relevant to the team emotional intelligence and by extension the performance of the team. Furthermore total EI of the team leader has significant association with all TEI levels and total TEI. This implies that for the construction design teams the leader EI contributes significantly to team emotional intelligence as established by Lee and Wang (2017), Stubbs (2005) and Boyatzis et al. (2008) studies. However, the influence of the team leader EI on TEI for construction Industry is a result of the trust the team members have on the leader rather than control usually associated with military setting.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Findings

i. The leader EI competences and team EI norms can be said to be above average however, the mean scores did not reach the 4.3 and thus the competences are yet to be of "strength".

ii. All team leaders demonstrated Emotional Self- Control competence to an above average level thus indicating that emotional outbourst in construction design teams is minimal.

iii. Teams from a multi-disciplinary firms are more likely to build higher emotional intelligence at both indidividual and team level than teams that have members coming from seperate firms.

iv. The construction design teams may not be considered as highly fragmented in nature as shown by the results of the team emotional intelligence which shows that the TEI norms Solve Problem Proactively and Building External Relationships indicates that design team members tend to identify and address potential problems implying that they see themselves as a team with a common goal.

v. The total performance scores shows that teams studied are yet to reach the best perormance especicially in teams where members come frrom separate firms.

vi. Total EI has a significant association with only the team's self-direction thereby suggesting that for construction design teams the leader EI does not contribute significantly to overall team performance.

vii. The Self-Management and Relationship Management of team leaders contribute significantly to team performance in construction design teams.

viii. The leader EI contribute significantly to team emotional intelligence norms in a construction design teams as a result of the trust team members have on the leader.

ix. Total TEI have significant positive association with the Self-direction measure and average (overall) performance suggesting that for construction design teams the TEI may contribute significantly to team performance.

5.2 Conclusion

This study concludes that team emotional intelligence has higher influence on the performance of construction design teams over the leader EI. Nevertheless, the team leader EI has strong influence on the team intelligent norms which further influences the team performance. This is however for construction design teams of institutional public project procured through the tertiary education trust fund (TETfund) where team members had interraction in more than one project of similar nature. Perharps the result may be the same or different for other type of projects.

5.3 Recommendations

i. Individual emotional competences should be developed with emphasis on the Self- management and Relationship Manangement cluster given that every professional in construction is a potential team leader. Thus all professionals in the industry should be equipped with EI skills through inclusion in continuous development programs.

ii. Pre-qualification criteria of potential design team members should be enhanced to include evaluation of previous team participation in addition to individual evaluation so as to reduce the effect of the fragmented nature of the construction

industry. This will bring teams to understand the importance of teamwork in each project.

iii. In addition, an assessment based on Group Fundamentals and Social Capital should also be included in the prequalification criteria to enable the identification of professionals likely to build team emotional norms.

5.4 Contributions to knowledge

i. Teams from multidisciplinary firms showed strength in both leader EI and team EI having met the average threshold of 4.3, while the inter-firm teams scored below the 4.3 threshold thereby yet to attain strength in EI competences and team EI norms.

ii. The self-management (SM) and relationship management (RM) of the team leader have positive association with team emotional intelligence (TEI) as indicated by the correlation coefficients of 0.587 and 0.549 with significance values at .002 and 0.003 respectively. Thus indicating that leader SM and RM competences influences team EI in construction design teams.

iii. Team emotional intelligence has a significant positive association with team performance as indicated by the correlation coefficient of 0.401 with a significance value of 0.042.

iv. Team leader EI has weak association with team performance as shown by the result of the correlation to be 0.259 with significance value of 0.193. Thus the team leader EI do not directly influence the team performance in construction design team.

5.5 Recommendations for Further Studies

i. This study could be replicated in other team-related work environment within construction as well as outside the construction industry such as teaching and learning in higher education institutions, hospitals, financial institutions and others.

ii. This study could be replicated also in other context of procurement routes such as design and build and public-private partnership.

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APPENDICES

Appendix A: Hay Group (ESCI) Conditional Use Agreement

For good and valuable consideration the receipt and legal sufficiency of which are hereby acknowledged. I hereby agree that the permission granted to me by Hay Group. Inc. to receive and utilize without charge. The Emotional and Social Competency Inventory (ESCI) is subject to the following conditions. All of which I hereby accept and acknowledge:

I. I will utilize the ESCI for research purposes only and not for commercial gain.

2. The ESCI and all derivatives thereof is and shall remain the exclusive property of Hay Group. Hay Group shall own all right, title and interest including without limitation the copyright in and to the ESCI.

3. I will not modify or create works derivative of the ESCI or permit others to do so. Furthermore, I understand that I am not permitted to reproduce the ESCI for inclusion in the thesis/research publication.

4. I will provide Hay Group with a copy of any research findings arising out of my use of the ESCI and will credit Hay Group in any of my publications relating thereto. Hay

Group may disseminate this research and report any results relating to the ESC1

5. I will not provide individual feedback to participants.

6. HA Y GROUP WILL NOT BE DEEMED TO HAVE MADE ANY

REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, IN CONNECTION WITH THE ESCI. INCLUDING. BUT NOT LIMITED TO. THE IMPLIED WARRANTIES OR MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

7. My rights under this Agreement are non-transferable and non-exclusive and will be limited to a period of two (2) years from the date of this Agreement.

8. Hay Group may immediately terminate this Agreement by giving written notice to me in the event that I breach any of its terms or conditions.

9. This Agreement will be construed in accordance with the laws of Pennsylvania without recourse to its conflict of laws principles.

10. This Agreement may not be assigned by me without the prior written consent of Hay Group. Any attempted assignment shall be void.

11. Failure by Hay Group to enforce any provisions of this Agreement will not be deemed a waiver of such provision or any subsequent violation of the Agreement by me.

12. This is the entire agreement with Hay Group pertaining to receipt and use of the ESCI, and only a written amendment signed by an authorized representative of Hay Group can modify this agreement.

Signature Print Name Date

Appendix B: Group Emotional Competence Survey Conditional Use Agreement

I hereby agree that the permission granted to me by Steven Wolff and Vanessa Druskat to receive and utilize without charge the Group Emotional Competence Survey (GEC) is subject to the following conditions of which I hereby accept and acknowledge:

1. I will utilize the GEC for research purposes only and not for commercial gain.

2. The GEC and all derivatives thereof is and shall remain the exclusive property of Steven Wolff and Vanessa Druskat who shall own all rights title and interest including without limitation the copyright in and to the GEC.

3. I will not modify or create works derivative of the GEC or permit others to do so. Furthermore I understand that I am not permitted to reproduce the GEC for inclusion in my thesis/research publication. You may include a sample question for each construct.

4. I will provide Steven Wolff or Vanessa Druskat with a copy of any research findings arising out of my use of the GEC and will credit Steven Wolff and Vanessa Druskat in any of my publications relating thereto. Steven Wolff and/or Vanessa Druskat may disseminate this research and report any research relating to the GEC.

5. I will provide yearly updates of my research progress on the anniversary date of the signing of this agreement until the final write-up of the results is provided.

6. I will not provide feedback to teams or team members.

7. I may put the survey online; however, I understand that access to the survey must be controlled via a login and may not be publically available. Once my study is complete I understand I must delete the online survey so that it is no longer available to anyone.

8. STEVEN WOLFF AND VANESSA DRUSKAT WILL NOT BE DEEMED TO HAVE MADE ANY REPRESENTATION OR WARRANTY EXPRESS OR IMPLIED IN CONNECTION WITH THE GEC, INCLUDING BUT NOT

LIMITED TO THE IMPLIED WARRANTIES OR MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

9. My rights under this Agreement are non-transferable and non-exclusive and will be limited to a period *of* two (2) years from the date *of* this Agreement.

10. Steven Wolff and/or Vanessa Druskat may immediately terminate this Agreement by giving written notice to me in the event that I breach any *of* its terms *or* conditions.

11. This Agreement may not be assigned by me without the prior written consent of Steven Wolff and/or Vanessa Druskat. Any attempted assignment shall be void.

12. Failure by Steven Wolff and/or Vanessa Druskat to enforce all or any provisions of this Agreement will not be deemed a waiver of such provision or any subsequent violation of the Agreement by me.

13. This is the entire agreement with Steven Wolff and Vanessa Druskat pertaining to my receipt and use of the GEC, and only a written amendment signed by Steven Wolff or Vanessa Druskat can modify this agreement.

Signature	Print Name	Date

Appendix C: E-mail Sample for Questionnaire Link

Dear participant (Full Name),

You are requested to take part in a Ph.D. research study of leader and team effectiveness of construction design teams conducted by ***Fatima Muhammad Bello of the Department of Quantity Surveying, Ahmadu Bello University Zaria.*** The purpose of the study is to learn about the factors that support effective team functioning using the concepts of "Emotional Intelligence (EI) and Team Emotional Intelligence (TEI)."

The concept of EI is concerned with the ability of an individual to recognise, understand and manage emotions in one's self and others.

The concept of TEI is concerned with the patterns of behavior, or norms that develop as the team goes about its task.

If you agree to be in this study, we request that you complete the survey. The survey is in two parts which are;

1. **PART A:** Team Leader's EI in which the team leader will do a self-assessment of his/her EI while the other team members will also rate the team Leader's EI using the same set of questions answered by the team leader.
2. **PART B:** This is in two sections: the first consists of questions about team norms of the group while the second part comprises of questions on team performance.

The survey will take approximately 40 minutes to complete.

Responses to the questions and any records of the study will be kept completely confidential.

You will be required to give your experience on **Project ABC at XYZ Institution**. The project team members are:

PROJECT MANAGER : XXXXX

ARCHITECT : XXXX

QUANTITY SURVEYOR : XXXXX

SERVICES ENGINEER : XXXXX

STRUCTURAL ENGINEER: XXXXX

To start the process, you need to:

- Click on the links provided below **SEPERATELY** for the two parts (A & B) of the survey
- Read the online instructions and **complete your survey(s)**
- **I will be glad to receive your response on/ before 12/19/2018.**

For Part A: Rating your Emotional Intelligence, Click here .

Part B: For the Team Emotional Intelligence, follow this link: https://www.surveymonkey.com/r/Team_EI

If you have any questions, please contact Fatima Muhammad Bello at fateezahra@gmail.com. Thank you for your participation.

Appendix D: Hardcopy Sample Questionnaire

DEPARTMENT OF QUANTITY SURVEYING
FACULTY OF ENVIRONMENTAL DESIGN
AHMADU BELLO UNIVERSITY
ZARIA, KADUNA STATE

Dear Sir/ Ma

You are requested to take part in a Ph.D. research study of leader and team effectiveness of construction Design teams conducted by ***Fatima Muhammad Bello of the Department of Quantity Surveying, Ahmadu Bello University Zaria.*** The purpose of the study is to learn about the factors that support effective team functioning using the concepts of "Emotional Intelligence (EI) and Team Emotional Intelligence (TEI)."

- **The concept of EI** is concerned with the ability of an individual to recognise, understand and manage emotions in one's self and others.
- **The concept of TEI** is concerned with the patterns of behaviour, or norms that develop as the team goes about its task.

Please kindly assist by taking part in this survey. Your quick response will be highly appreciated as this will help in understanding team behaviours for better project performance.

Thank you for participating.

Fatima Muhammad Bello (08031530228, fateezahra@gmail.com)

Note:

This questionnaire elicit data from the interactions you had with team members on the project as follows:

PROJECT TITLE: Proposed Faculty Academic Infrastructure (Faculty Offices , Dept. of Architecture, Dept. of Geology, Dept. of Geography, Dept. of URP, Dept. of Q/S)

CONTACT INFO	**Firm/ Person**
PROJECT MANAGER:	XXXXX
ARCHITECT:	XXXXX
QUANTITY SURVEYOR:	XXXXX
SERVICES ENGINEER:	XXXXX
STRUCTURAL ENGINEER:	XXXXX

	SECTION A: PROJECT MANAGER'S EMOTIONAL INTELLIGENCE For each statement please tick the option that best describe how frequently the project manager exhibited the behavior.	Never	Rarely	Sometimes	Often	Consistently	Don't know
1	Propriety Instrument (items not to be disclosed)						
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
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21							
22							
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24							
25							
26							
27							
28							
.							
.							
.							
68							

	SECTION B: TEAM NORMS For each statement please tick the option that best describe your team.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Propriety Instrument (items not to be disclosed)					
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
.						
.						
.						
68						

SECTION C: TEAM PERFORMANCE

This section measures the effectiveness of your team. Kindly circle the best option that best describe the team performance.

1. Efficiency in getting things done
    a) Poor
    b) Average
    c) Outstanding

2. Quality of work
    a) Poor
    b) Average
    c) Outstanding

3. Ability to be self-directed
    a) Poor
    b) Average
    c) Outstanding

4. Performance against all other teams in the division that perform similar work
    a) Poor
    b) Average
    c) Outstanding

5. Ability to continue working together effectively in the future
    a) Poor
    b) Average
    c) Outstanding

6. Profession of respondent
    a) Project Manager
    b) Architect
    c) Quantity Surveyor
    d) Services Engineer
    e) Structural Engineer

Appendix E: Druskat and Wolff's Team Emotional Norms

Individual-Level Norms

At the individual level, the norm of Understand Team Members helps the team become aware of its members' needs, perspectives, and emotions. The norms of Address Unhelpful Behavior and Demonstrate Caring help guide the team's behavior toward its members.

• ***Understand Team Members***—this norm represents the degree to which a team attempts to understand the needs, perspectives, skills, and emotions of its members. The strength of this norm relates to the degree to which members build bonds among themselves and the degree to which members identify with the team.

• ***Address Unacceptable Behavior***—this norm represents the degree to which a team addresses member behavior that goes against agreed upon norms or is harmful to team effectiveness. This norm requires skills of empathy, self-control, and persuasion to carry it out effectively. It must also be coupled with the norm of Demonstrate Caring. This norm contributes to a sense of efficacy in the team. When team members know that disruptive behavior will be confronted, they feel more confident in the team to accomplish its task.

• ***Demonstrate Caring***—this norm represents the degree to which a team treats its members with respect, supports them, seeks their perspective, and validates their efforts. It does not imply that team members must like each other or socialize with each other. The strength of this norm affects the degree to which members build bonds and identify with the team. It also contributes to a sense of safety in the team.

Team-Level Norms

At the team level, the norm of Review the Team helps the team become aware of how well it is working and the general mood in the team. The norms of Support Expression, Build Optimism, and Solve Problems Proactively guide the team's behavior in a way that helps them address challenges in a way that creates positive energy yet avoids distorting the reality of the situation.

• ***Review the Team***—this norm represents the degree to which a team is aware of how it is performing, its collective moods, and seeks information to help it evaluate how well it is working. This norm has emotional consequences in that it can create emotional threats.

The next three norms help determine how well the team deals with the emotional threats. One key to an effective team is to have a good sense of reality and not shy away from it when it gets emotionally threatening.

• ***Support Expression***—this norm represents the degree to which a team provides resources for the team to address emotions, e.g., time and a language for talking about emotions.

• ***Build Optimism***—this norm represents the degree to which a team stays positive and optimistic in the face of challenges. This norm has emotional consequences because the degree to which members of the team remain optimistic will affect their sense of efficacy and will minimize the sense of threat caused by the challenge.

• ***Solve Problems proactively—***this norm represents the degree to which a team anticipates problems and takes action to prevent them as well as taking responsibility and working hard to address challenges. This norm has emotional consequences similar to that of Build Optimism. The greater the degree to which a team takes control of solving its problems the greater will be its sense of efficacy and the less threatening challenges will feel to team members.

Cross-Boundary-Level Norms

At the cross-boundary level the norm of Understand Team Context helps the team become aware of the needs and concerns of those outside the team and understand how its work fits into the organization. The norm of Building External Relations guides the team's behavior based on their understanding of the organization.

• ***Understand Team Context***—this norm represents the degree to which a team seeks to understand the needs and concerns of those outside the team as well as the impact of its work and how it contributes to the organization's goals. This norm has emotional consequences related to the relationship of the team to decision makers and other teams. To build ties with others outside the team it is first necessary to understand them.

• ***Building External Relations***—this norm represents the degree to which a team actively and strategically builds relationships with other people and teams who can affect their performance and provide resources. This norm has emotional consequences in that it builds bonds with others outside the team as well as evokes cooperation and attracts resources that help the team accomplish its goals. This leads to a sense of efficacy.

Appendix F: FOCUS GROUP INTERACTION GUIDE

Title: The Influence of Emotional Intelligence on the Performance of Construction Design Teams

Introduction

The purpose of the study is to learn about the factors that support effective team functioning using the concepts of Emotional Intelligence (EI) and team emotional intelligence (TEI).

- EI is concerned with the ability of an individual to recognise, understand and manage emotions in one's self and others.
- TEI is concerned with the patterns of behavior, or norms that develop as the team goes about its task.

The study measured:

- EI of team leaders by asking the team members to rate the leader.
- TEI of the team
- Performance of the teams

TEAM LEADER EI

1. It has been proven that the team leader EI affect the team performance and that construction design teams are known to be self-directed; does the project manager (PM) for this team take the full responsibility of a leader or did any member assumed the PM's role?
2. How is the emotional intelligence of the PM of this team compared to other team leaders you have worked with?
3. Will this result be also be true for other teams you have participated and why?

Highest scored competences

a. ***Teamwork:*** the ability to work with others toward a shared goal; participating actively, sharing responsibility and rewards and contributing to the capability of the team.

b. ***Achievement orientation***: striving to meet or exceed a standard of excellence; looking for ways to do things better, set challenging goals and take calculated risks.

c. ***Emotional self-control:*** the ability to keep disruptive emotions and impulses in check and maintain one's effectiveness under stressful or hostile conditions.

4. **Lowest scored competences**

a. ***Emotional self-awareness:*** the ability to understand one's emotions and their effects on performance.

b. ***Influence:*** the ability to have a positive impact on others, persuading or convincing others in order to gain their support.

TEAM EMOTIONAL INTELLIGENCE

V. It has been proven that the team leader EI affect the team emotional intelligence norms and by extension the team performance; do you think that the emotional intelligence of the team leader is responsible for the team emotional intelligence norms? What are the reasons for your responses?

VI. Will the team EI be the same without a PM leading the team? Please provide reasons for the response given.

VII. Will the findings also be true for other teams you have participated and why?

Highest scored TEI norms

a. *Demonstrate caring:* degree to which a team treats its members with respect, supports them, seeks their perspective, and validates their efforts. It does not imply that team members must like each other or socialize with each other.

b. *Problems proactively*: the degree to which a team anticipates problems and takes action to prevent them as well as taking responsibility and working hard to address challenges.

c. *Build optimism:* the degree to which a team stays positive and optimistic in the face of challenges.

Lowest scored TEI norms

c. ***Review the team:*** the degree to which a team is aware of how it is performing, its collective moods, and seeks information to help it evaluate how well it is working.

d. ***Support expression***—this norm represents the degree to which a team provides resources for the team to address emotions, e.g., Time and a language for talking about emotions.

TEAM PERFORMANCE

IV. In your opinion, what is of greater influence to performance between the team leader EI and Team EI? State reasons for your response.

1. Will performance change if the leader is changed?
2. How is the performance of the team compared to other similar teams you have participated?