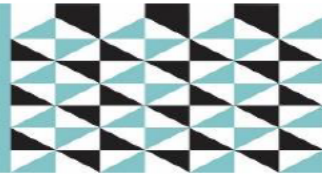


DURBAN UNIVERSITY OF TECHNOLOGY

**THE ROLES OF SUPERVISOR DARK TRIAD TRAITS AND ICT
ADOPTION ON EMPLOYEE ENGAGEMENT AND ORGANIZATIONAL
OUTCOMES IN GHANAIAN TECHNICAL UNIVERSITIES.**

MONICA DEDE TEKYE ANSAH YAWSON

AUGUST 2024



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ADOPTION ON EMPLOYEE ENGAGEMENT AND
ORGANIZATIONAL OUTCOMES IN GHANAIAN TECHNICAL
UNIVERSITIES.**

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by

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DECLARATION BY STUDENT

I declare that I conducted this thesis by following the guidelines provided by the Faculty of Management Sciences of the Durban University of Technology and further declare that the outcome of the entire study is the result of my independent investigation, except where otherwise stated. The references used have been duly acknowledged as in-text citations and have been referenced. Finally, I declare that no part of this dissertation has been submitted for the award of any other degree, or concurrently submitted in candidature for any other doctoral degree, in any other institution of higher education.

Name: Monica Dede Tekyi Ansah Yawson Signature: _____ Date: August
2024

NOTICE OF CONSENT

I, Monica Dede Tekyi Ansah Yawson, hereby give my consent that this thesis can be photocopied for inter-library loan and that the title and abstract may be made available to institutions external to the Durban University of Technology, as well as to and future students.

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ABSTRACT

Employee engagement is a key factor influencing positive organizational outcomes, such as job satisfaction and enhanced performance. This study explores the impact of employee engagement in Ghana's technical universities using the Job-Demands Resource theory, Affective Event theory, and Activation theory. It examines ICT adoption as a mediator and supervisor Dark Triad traits as a moderator in the relationship between employee engagement and organizational outcomes.

The study employs a descriptive and explanatory research design with a positivist philosophy, targeting 3,003 teaching and non-teaching staff from five Ghanaian technical universities. From a sample size of 341, 280 valid responses were analyzed using Structural Equation Modeling (SEM).

Findings indicate that employee engagement positively affects both task and citizenship performance, is correlated with ICT adoption, and ICT adoption partially mediates the relationship between employee engagement and organizational outcomes. The direct impact of supervisor Dark Triad traits, specifically Machiavellianism and narcissism, was not supported, while psychopathy affected organizational outcomes. Supervisor Dark Triad traits did not moderate the employee engagement-organizational outcomes relationship.

The study underscores the importance of fostering employee engagement and ICT adoption in Ghana's technical universities to enhance performance. It also highlights the need for awareness and management of negative supervisor traits, particularly psychopathy. These insights contribute to the literature and provide practical recommendations for leaders and managers in educational institutions to promote employee engagement and leverage technology for organizational success.

Keywords: Employee engagement, Supervisor Dark Triad, ICT Adoption, Task and Citizenship performance

DEDICATION

In loving memory of my late parents, Rt Rev. Joseph Kow Tekyi-Ansah, and Mrs Mary Tekyi-Ansah

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LIST OF ABBREVIATIONS

TP	Task performance
CP	Citizenship performance
DUT	Durban University of Technology
EE	Employee engagement
CE	Cognitive Engagement
EE	Emotional Engagement
BE	Behavioural Engagement
DT	Dark Triad
SDT	Supervisor Dark Triad
Mac	Machiavellianism
Psy	Psychopathy
Nas	Narcissism
ICT	Information and Communication Technology
OCB	Organizational Citizenship Behaviour
OCBI	Individual-level Organizational Citizenship Behaviour
OCBO	Organisation-level Organizational Citizenship Behaviour
SPSS	Statistical Package for Social Sciences
H	Hypothesis
JD-R	Job-demands resources
AET	Affective event theory
AT	Activation theory
RQ	Research questions
EFA	Exploratory factor analysis
CFA	Confirmatory factor analysis
AVE	Average variance extracted
SEM	Structural equation model

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CHAPTER ONE

OVERVIEW OF THE STUDY

1.1 Introduction

Employee engagement has been identified as an essential factor in enhancing organisational outcomes. However, studies suggest that several factors may influence the relationship between employee engagement and organisational outcomes (Kahn, 1990; Bakker & Leiter, 2010; Rich et al., 2010). This research aims to explore the roles of two key factors, namely, information and communication technology (ICT) adoption and supervisor dark triad (SDT), in the relationship between employee engagement and organisational outcomes (task and citizenship performance) in Ghanaian technical universities. This chapter covers the background of the study, the statement of the problem, the research aims and objectives, the research questions, the significance of the study, the scope and delimitation, and the organisation of the study.

1.2. Background of the Study

In today's rapidly evolving and competitive business environment, organisations are increasingly recognising the critical importance of employee engagement and organisational outcomes in achieving sustainable success (Bakker & Demerouti, 2017; Saks, 2006). Global competition has compelled businesses to improve quality, cost, and productivity through technology adoption and staff engagement (Datta, 2010:3).

This research focuses on technical universities in Ghana, which provide practical and technical education aimed at equipping students with skills relevant to the needs of industries and the labour market. Technical universities have unique characteristics such as hands-on training, industry collaboration, entrepreneurial training, applied research, and competency-based education. However, they also face significant challenges, including inadequate funding, poor infrastructure, outdated equipment, limited resources for research, and a perception of lower status compared to traditional universities.

The COVID-19 pandemic further exacerbated these challenges, as the sudden shift from in-person to online teaching created significant difficulties for faculty and staff, many of whom were unprepared for this transition. The lack of adequate training and

resources to use online teaching tools effectively resulted in increased stress and decreased job satisfaction (Johnson et al., 2020). Many universities struggled with inadequate technological infrastructure to support the rapid deployment of online learning. Faculty and staff faced difficulties with unreliable internet connections, outdated hardware, and insufficient technical support, which hindered their ability to engage effectively with students and colleagues (Dhawan, 2020).

Employee engagement in higher education, especially in technical universities, is crucial for fostering innovation, effective teaching, and research excellence. Employee engagement, characterised by a strong emotional and intellectual connection between employees and their work, drives individual performance, job satisfaction, and overall organisational effectiveness (Bakker & Leiter, 2010:3–4; Harter, Schmidt, & Hayes, 2002:268). Eiampradispon and Eaknarajindawat (2021:38–39) argue that employee engagement (EE) is a sense of loyalty towards the employer, particularly in times of crisis. In other words, the level of employee engagement in any organisation is tested when confronted with external forces, such as the COVID-19 pandemic.

Employee engagement (a dependent variable) involves dedication, enthusiasm, and active involvement in one's job to achieve organisational goals and vision (Gupta, 2015). Saks (2006:606) describes it as the integration of cognitive, emotional, and behavioural dimensions, fostering a state of absorption in one's job. Shuck et al. (2014:240) characterize employee engagement as a proactive, work-related mindset that focuses on achieving organisational goals through cognitive, emotional, and behavioural energy. This description, which integrates Saks' multidimensional framework and expands upon previous research (Schaufeli et al., 2002; Maslach et al., 2001; Kahn, 1990), describes a dynamic psychological state that encompasses all facets of the work environment. Macey and Schneider (2008) classify employee engagement into three levels: engaged, not engaged, and actively disengaged. Engaged employees exhibit high levels of enthusiasm and energy, driving positive change within their organizations. Disengaged employees, on the other hand, show passivity and a lack of connection to their work, while actively disengaged employees detract from organizational productivity.

Engaged workers provide a competitive advantage to the firm by reducing employee attrition, boosting productivity, enhancing business performance, and boosting revenue

(Osborne & Hammoud, 2017:50; Kaliannan & Adjovu, 2015:161; Kumar & Pansari, 2016:497; The Insights Group Ltd., 2014). Organisations with a high EE see revenue growth up to 4.5 times quicker than ordinary business (Delaney & Royal 2015). In the United States, Smith's (2009) studies found a \$350 billion loss due to disengaged workers' low performance. After three years of applying initiatives to increase employee engagement, the staff turnover rate at Kia Motors UK fell from 31% to below 2%. Employee engagement is essential for ensuring organizational outcomes, with benefits evident in workers' tasks and citizenship performance (HR Focus, 2016:8).

Organisational outcomes (dependent variable) are the results of organisational processes and activities, typically measured in terms of performance metrics such as task performance and citizenship performance. Task performance refers to an employee's proficiency in carrying out his or her essential work duties or role-based tasks (Borman and Motowidlo, 1993; Conway, 1999:11). According to Anton and Miro's (2017) assertion, an employee's job/task performance reveals both financial and non-financial outcomes, which directly impact the business's performance and success. This relationship also strengthens the adoption of technology by increasing employee engagement. In technical universities, task performance refers to achieving high-quality teaching, impactful research, and successful implementation of innovative practices (Ankrah & Atuahene, 2021). The dependent variable, citizenship performance, encompasses behaviors that extend beyond task performance and technical skill. These behaviors support the organisational, social, and psychological framework, which serves as a crucial catalyst for task completion (Borman, 2004:235). Stated differently, the discretionary behavior of technical university employees not only contributes to their core job responsibilities but also enhances stakeholder satisfaction and enhances the institution's effective functioning. The job demands-resources (JD-R) theory (Bakker & Demerouti, 2007) supports the HR focus assertion that employee engagement is central to organizational outcomes. The theory suggests that high job demands, when not sufficiently balanced by job resources, can lead to strain, burnout, and negative outcomes. Conversely, the presence of adequate job resources can buffer the negative impact of job demands and foster employee engagement. Engaged employees, in turn, experience positive emotions, high levels of energy, and a sense of dedication to their work tasks that lead to excellent organisational outcomes, as evidenced by workers' task and citizenship performance. This study argues that the

benefits of employee engagement on organisational outcomes depend on the strain placed on employees by their supervisors. Employees demonstrate high engagement when they receive caring supervision, which is expressed as a low-supervisor dark triad trait.

Supervisor dark triad traits—narcissism, Machiavellianism, and psychopathy—are personality characteristics that can significantly impact workplace dynamics (Paulhus & Williams, 2002), which are indicative of malevolent personality qualities (Cohen, 2016:70). Narcissistic supervisors may exhibit self-centred behaviours and a lack of empathy, while Machiavellian leaders are manipulative and strategic in their interactions. Psychopathic traits in supervisors can lead to impulsivity, a lack of remorse, and antisocial behaviours (O'Boyle et al., 2012). The relationship between supervisor dark triad traits and employee engagement is complex. These traits can negatively affect employee engagement, leading to a disengaged and demotivated workforce (Smith & Lilienfeld, 2013). Conversely, positive supervisor behaviours can enhance engagement and job satisfaction. Further investigation into how supervisor dark triad traits moderate the link between employee engagement and organisational outcomes will enrich the literature on employee engagement and provide insights into personality trait differences.

Supervisor dark triad trait is expected to serve as a boundary condition between employee engagement and organizational outcomes. According to activation theory (Gardner, 1986:413; Gardner & Cummings, 1988:90), an optimal level of stress experienced by engaged employees from their supervisors can inspire performance. However, excessive stress from high-supervisor dark triad traits can harm engaged employees' performance, reducing organisational outcomes.

Existing studies have explored other moderating variables. For instance, Bouncken, Cesinger, and Tiberius (2020:299) found that high-manager dark triad traits suppress the positive effect of employees' entrepreneurial orientation on firm performance more than low-manager dark triad traits. Teng, Cheng, and Chen (2021:155) found that high-abusive supervision weakens the obsessive passion-job embeddedness relationship more than low-abusive supervision. Exploring the influence of dark triad traits in supervisors' roles in employee engagement offers a novel perspective on employee-employer relationships and their impact on organizational outcomes.

Furthermore, the global outbreak of COVID-19 has resulted in a steady shift towards online work activities and blended learning environments (Koomson, 2022; Turkmenoğlu, Ulukok, Dogan, & Akin, 2020:116). The pandemic has necessitated enterprises to strengthen their information and communication technology (ICT) infrastructure, and employees have had to upgrade their ICT skills in order to effectively adapt to the changing workplace dynamics. ICT adoption refers to the incorporation of digital tools and systems in order to enhance communication, collaboration, and information accessibility (Tarhini, Hone, & Liu, 2014). Corrales and Westhoff (2006:928) define ICT adoption as an individual's decision to accept or reject a particular innovation and the degree to which they integrate it into the appropriate context. Effective ICT integration can enhance teaching and administrative processes, fostering a more engaging and efficient educational experience. However, the extent of ICT adoption varies across institutions, with challenges such as inadequate infrastructure, limited training, and resistance to change hindering progress (Badu & Dzandu, 2020).

The development and application of ICT in African institutions of higher learning is critically important if the continent is to reduce the knowledge, technological, and economic gaps between itself and the rest of the world (Sutee, Ashraf, and Malu, 2012).

The research suggests that using ICT can help balance this relationship by creating better ways to communicate, work together, and get resources. This could lessen the negative effects of dark triad traits (Tarafdar et al., 2019). Affective events theory (Weiss & Cropanzano, 1996: 50) explains the proposed mediating role of ICT adoption in the relationship between employee engagement and organisational outcomes. This theory posits that workplace events elicit emotional responses from employees, shaping their attitudes and behaviors. Previous studies have used other mediating variables. For example, Ismail, Iqbal, and Nasr (2018:15) found that creativity mediates the relationship between employee engagement and work performance. Kapil and Rastogi (2019:191) determined that organisational job-embeddedness partially mediates the relationship between employee engagement and citizenship conduct. Ahad and Khan (2020:20) found that employees' experiences mediate the relationship between employee engagement and organisational citizenship conduct. However, few studies have investigated ICT adoption as a mediator.

In the context of technical universities in Ghana, where technological advancements drive innovation and academic excellence, understanding the dynamics that impact employee engagement and organisational outcomes becomes paramount. Against this background, this study assesses the moderating and mediating roles of the supervisor dark triad and ICT adoption on employee engagement and organisational outcomes in the technical universities of Ghana. The next section explains in detail the research gaps that this research addresses.

1.3 Statement of the Problem

Ghanaian technical universities have undergone significant changes, transitioning from polytechnics to technical universities with the aim of improving the welfare and compensation packages of employees (Frimpong, Agyekum, and Asare, 2018:179). However, despite the change in nomenclature, the anticipated enhancements in employee welfare have not fully materialized. Compounding this issue, a recent staff audit by the National Council for Tertiary Education (now Ghana Tertiary Education Commission) revealed several critical concerns that have impacted employee morale and engagement. These findings included the drastic reduction of the rank and salary of affected employees, discrepancies in job descriptions, and inconsistencies in staff qualifications and placements (Duodu, 2019:13).

The audit report highlighted significant issues such as the mismatch between employees' qualifications and their job roles, leading to feelings of job insecurity and dissatisfaction among staff. Additionally, there were concerns about the lack of transparency in the promotion and remuneration processes, which further exacerbated employees' feelings of neglect and non-fulfillment (Sunyani Technical University, 2020:1). These sentiments are expected to decrease employee engagement, potentially undermining their ability to produce favorable organizational outcomes.

Moreover, poor leadership has been identified as a critical issue within Ghanaian technical universities, exacerbating the negative effects of a disengaged workforce on organizational outcomes (Broni, 2017:1). Poor leadership can manifest in various detrimental traits, including narcissism, Machiavellianism, and psychopathy, collectively known as the dark triad. These traits are characterized by manipulative behavior, lack of empathy, and self-centeredness, which can further demoralize

employees and impede their engagement (Jonason, Webster, Schmitt, Li, & Crysel, 2012:). Therefore, understanding the impact of supervisor dark triad traits on employee engagement and organizational outcomes is crucial.

Additionally, there is a notable apathy among some technical university employees towards the adoption of ICT for service delivery, especially during the COVID-19 era (Adarkwah, 2020:17; Adnan & Anwar, 2020:48). This reluctance to embrace ICT could mediate the relationship between a disengaged workforce and suboptimal organizational outcomes. In other words, low levels of employee engagement may hinder ICT adoption, which could subsequently diminish organizational performance.

Empirical research on the effect of supervisor dark triad traits on organizational outcomes is sparse. Existing studies have predominantly focused on abusive supervision (Moin, Wei and Weng, 2020:506; Rice, Taylor and Forrester, 2020:615; Younus et al., 2020:86; Zhao & Guo, 2019:1992; Huang et al., 2019:525; Pan et al., 2018:2267), CEO's negative traits (Myung et al., 2017:18), toxic leadership (Kayani & Alasan, 2021:19), and leader-member exchange (Shu & Lazatkhan, 2017:78); overlooking supervisor dark triad. Additionally, few analysts have used supervisor dark triad to moderate the direct relationship between employee engagement and organizational outcomes. The most proximate study identified was conducted by Koomson (2021:17), who examined the moderating influence of psychological contract violation on the relationship between work satisfaction and citizenship behaviours.

Additionally, there is a lack of literature on the mediating role of ICT adoption between employee engagement and organizational outcomes. Most existing studies have employed other mediating variables, such as organizational politics (Eldor, 2017:255), job satisfaction (Al-dalahmeh et al., 2018:40), employee creativity (Ismail et al., 2018:15), organizational job-embeddedness (Kapil & Rastogi, 2019:2012), employees' experience (Ahad & Khan, 2020:20); largely neglecting ICT adoption. Understanding the mediating effect of ICT adoption is particularly critical in the current crisis, yet most studies have overlooked the perspectives of employees in higher education institutions.

To address these gaps, this study seeks to assess the roles of supervisor dark triad traits and ICT adoption in the relationship between employee engagement and organizational outcomes in Ghanaian technical universities.

1.4 Aim and Objectives

The goal of this research was to evaluate the moderating influence of supervisor dark triad traits and the mediating role of ICT adoption in the association between employee engagement and organisational results, as exhibited by employees at technical universities of Ghana.

1.4.1 Objectives of the Study

The following specific objectives would be achieved at the end of the research:

- i. to assess the effect of employee engagement on organisational outcomes (task performance and citizenship performance) at technical universities of Ghana;
- ii. to examine the influence of employee engagement on ICT adoption at technical universities of Ghana;
- iii. to determine the influence of supervisor dark triad traits and ICT adoption on organisational outcomes (task and citizenship performance) at technical universities in Ghana;
- iv. to ascertain if supervisor dark triad traits moderate the relationship between employee engagement and organisational outcomes at technical universities in Ghana;
- v. to ascertain whether ICT adoption mediates the relationship between employee engagement and organisational outcomes at technical universities in Ghana; and
- vi. to develop a managerial framework to improve ICT adoption and supervisor dark triad traits to enhance employee engagement and organisational outcomes.

1.5 Research Questions

- i. What is the influence of employee engagement on organisational outcomes (task and citizenship performance) at technical universities in Ghana?
- ii. What is the influence of employee engagement on ICT adoption at technical universities in Ghana?

- iii. To what extent do supervisor dark triad traits and ICT adoption influence organisational outcomes (task and citizenship performance) at technical universities in Ghana?
- iv. To what extent do supervisor dark triad traits moderate the relationship between employee engagement and organisational outcomes at technical universities in Ghana?
- v. Does ICT adoption mediate the relationship between employee engagement and organisational outcomes at technical universities in Ghana?
- vi. What is the proposed managerial framework to improve ICT adoption and supervisor dark triad traits to enhance employee engagement and organisational outcomes at technical universities in Ghana?

1.6 Operationalization of the Study Variables

The study has four variables and each has its own specific indicators: organisational outcomes: task performance and citizenship performance (dependent variable); employee engagement (independent variable); supervisor dark triad traits (moderating variable); and information and communication adoption (mediating variable). Table 1.1 presents the details of the operationalisation of the concepts used in the study.

Table 1.1 Operationalization of the Study Variables

Variable	Type	Definition	Operationalisation Definition	Indicators
Employee engagement	Independent	Shuck et al. (2014:240) characterize employee engagement as a proactive, work-related mindset that focuses on achieving organisational goals through cognitive, emotional, and	The degree to which employees at Ghanaian Technical Universities demonstrate a proactive and optimistic psychological state, as evidenced by their positive thoughts, emotions, and	Emotional engagement Cognitive engagement Behavioural engagement

		behavioural energy.	behaviors in relation to their work.	
Organisational outcomes	Dependent		The results of organizational processes and activities, typically measured in terms of performance metrics such as task performance and citizenship performance.	Task performance Citizenship
Task performance	Dependent	Task performance refers to an employee's effectiveness in completing core job or role-based responsibilities (Conway, 1999). Motowidlo and Van Scotter (1994) define task performance as the required outcomes and behaviors that directly serve the goals of the organization.	The behaviors of technical university employees related to their core job tasks (teaching, research activities, and administrative work), recognized by the technical universities' formal HR management system, and contributing to the achievement of organizational objectives.	Task Proficiency Production/Efficiency Judgment/Problem Solving
Citizenship performance	Dependent	Citizenship performance involves behaviors beyond task	Discretionary behaviours of technical university employees that	Altruism, Conscientiousness, Sportsmanship, Civic virtue

		<p>execution and technical competence, contributing to the social, psychological and organizational context necessary for successful task completion (Borman 2004)</p>	<p>are not directly related to their core job responsibilities but facilitate stakeholder satisfaction and promote the effective functioning of the organization.</p>	
Supervisor Dark Triad	Moderator	<p>A cluster of three personality traits - narcissism, Machiavellianism, and psychopathy characterized by manipulateness, a lack of empathy, and self-centeredness (Paulhus & Williams, 2002)</p>	<p>A supervisor's undesirable personality qualities that result in bad behavioural consequences.</p>	<p>Machiavellianism, Narcissism, and psychopathy</p>
Ict adoption	Mediator	<p>ICT adoption is an individual's decision to either embrace or decline a specific innovation, as well as the degree to which the new</p>	<p>The decision an employee takes on whether to accept or reject a certain innovation and the degree to which that innovation is incorporated into that</p>	<p>Perceived ease of use Perceived usefulness Attitude towards use</p>

		technology is incorporated into that employee's job activities (Corrales and Westhoff 2006)	employee's job activities	
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1.7 Significance of the Study

This study contributes to research, knowledge, practice and policy. For research purposes, this study is critical because it introduces a very relevant construct - ICT adoption to the discourse about employee engagement. In this era of COVID-19 or crisis events, it is especially important to facilitate or mediate between a disengaged workforce and poor organisational performance. Furthermore, the paucity of literature on ICT adoption as a mediator in investigating the link between employee engagement and organisational outcomes seeks to contribute to the conversation meaningfully. Indeed, the literature on the association between supervisor dark triad traits and organisational outcomes is extremely limited internationally and even more so in Ghana. This study aims to make a significant contribution to that discourse. Again, the moderating impact of the supervisor dark triad trait was investigated in order to determine if it has a restricting or facilitating influence on organisational results.

In theory, this study advances our knowledge of the boundary conditions for the effect of supervisor dark triad traits on organisational outcomes. In other words, under what conditions may supervisor dark triad traits impact on organisational outcomes? This study investigated ICT adoption as a mediating variable, adding to our understanding of the mechanisms that relate employee engagement to organisational results. Again, the study adds to the body of knowledge and applies the underlying ideas on the relationship between employee engagement and organisational outcomes. Thus regarding the advancement of knowledge, the findings of this study will make a modest contribution to the reduction of knowledge deficiency in the areas of Human Resource Management and Organizational Development.

In practice, the findings of this study have significant implications for technical universities in Ghana, offering valuable insights for academic staff, administrators, and

policymakers. By examining the influence of supervisor Dark Triad traits and ICT adoption on staff engagement and organizational outcomes, the research provides strategies for enhancing employee engagement. Technical universities can boost job satisfaction, motivation, and overall staff engagement through targeted interventions based on the factors influencing employee engagement. This approach can lead to improved administrative efficiency, increased research output, and higher teaching quality.

Moreover, the study underscores the importance of ICT adoption in creating an efficient and supportive work environment. By optimizing ICT infrastructure and processes, universities can enhance communication, collaboration, and access to information. The research also highlights the critical role of effective leadership, showing how Dark Triad traits impact employee engagement and organizational outcomes. Technical universities can use these insights to inform recruitment, training, and development programs, ensuring that supervisors exhibit positive leadership behaviors that foster a healthy organizational culture.

In terms of policy, the report provides useful suggestions for the governance of higher education in Ghana. The report presents empirical data on the impact of supervisor qualities and ICT adoption on organisational performance, offering valuable information for policymakers seeking to improve the efficacy and efficiency of technical universities. This information may be used to shape national goals and policies that facilitate the professional growth of university personnel, the incorporation of new information and communication technology solutions, and the advancement of effective leadership practices.

1.8 Study Scope and Delimitations

The study focused on the moderating and mediating roles of supervisor dark triad and ICT adoption on the relationship between employee engagement and organizational outcomes. The research was delimited to technical universities because they play a crucial role in providing practical and technical education, which is essential for the development of skilled labor in the country. Only five out of ten technical universities

in Ghana were used because they shared similar characteristics. Data for this study was elicited from the teaching and non-teaching staff of these selected technical universities other than any other institution. These delimitations are intended to define the study variables and the population amenable to inquiry.

1.9 Structure of the Thesis

This thesis comprises seven chapters as follows:

Chapter 1 - Introduction: The first chapter gives a general overview of the study, including its background, problem statement and research objectives. The questions, which emanate from the research objectives, were also presented. It further explained the significance of the research, and the scope and limitations of the study.

Chapter 2 - Conceptual and Theoretical Review: The first part of the chapter provides a literature review of the concept that constitutes the research framework. It reviews the concepts of employee engagement, organisational outcomes (task performance and citizenship behaviour, supervisor dark triad trait and ICT adoption). The second part of this chapter reviews the literature on the theoretical basis for this research and explains how the theory is related to the concepts.

Chapter 3- Empirical Review and Hypothesis Development: This chapter focuses on the research framework and gives empirical evidence and support for the link between the constructs under investigation as well as how the hypotheses were developed. The review is guided by the study objectives and research questions. In the chapter's concluding section, the conceptual model is also presented and discussed.

Chapter 4 – Methodology: This chapter describes the methodological strategy for carrying out the study. It describes the research methodology, sampling design, and research tools. It also includes thorough details on how quantitative data was gathered. It additionally covers specific ways for applying square structural equation modelling (SEM) to assess quantitative data. The ethical implications and data quality were also explored.

Chapter 5 - Presentation of the Findings: The results of the data analysis are presented in this chapter. Based on the data provided, the quantitative findings were presented, and it was established how the constructs connection.

Chapter 6 - Discussion and Interpretation of Findings: This section presents the findings of the data analysis in relation to the research questions and specific objectives of the study. The present discourse also examines the manner in which the quantitative findings establish connections with or deviate from existing scholarly works.

Chapter 7 - Conclusions and Recommendations: This chapter offers an overview of the full study. It summarises the extent to which the study objectives were met by responding to the research questions in Chapter One. The chapter also discusses the unique contributions of the research by presenting theoretical and managerial research implications of the study, as well as limits and future research possibilities.

1.10 Conclusion

The introduction chapter established the groundwork for the entire investigation. Initially, it provided context by defining the concepts to be examined highlighting the importance of employee engagement and its impact on organizational outcomes within the unique setting of Ghanaian technical universities. It emphasized the critical role that supervisors' Dark Triad traits and ICT adoption play in shaping these dynamics. The statement of the problem underscored the gaps in existing literature, particularly the lack of empirical studies investigating the combined effects of supervisor personality traits and technology adoption on employee engagement and organizational performance in technical universities. This gap provided a compelling rationale for the study. The aim and objectives of the research were clearly articulated, outlining the specific goals to be achieved, such as assessing the effects of employee engagement on organizational outcomes, examining the influence of supervisor Dark Triad traits, and determining the mediating role of ICT adoption. Corresponding research questions were formulated to guide the investigation, ensuring a focused and systematic approach to addressing the research problem. The significance of the study was discussed in detail, highlighting its contributions to academic literature, practical implications for technical universities, policy recommendations, and broader social and economic impacts. The study's potential to offer actionable insights for university staff, policymakers, and other stakeholders was emphasized, showcasing its relevance and importance. The scope and delimitations section clarified the boundaries of the research which helped in setting clear expectations and limitations, ensuring a focused and manageable research process.

In summary, chapter one has provided a detailed and coherent introduction to the study, establishing a strong foundation for the subsequent chapters. It has set the stage for an in-depth exploration of the relationships between employee engagement, supervisor Dark Triad traits, ICT adoption, and organizational outcomes in Ghanaian technical universities. The subsequent chapter centres on a literature review of the concepts used in the research model and the theoretical foundations upon which the study is based.

CHAPTER TWO

CONCEPTUAL AND THEORETICAL REVIEWS

2.1 Introduction

This research seeks to investigate the role of supervisor Dark Triad and ICT adoption on employee engagement and organisational outcomes in technical universities in Ghana. This chapter considers the conceptual and theoretical reviews of the study. The conceptual review evaluates the concepts emanating from this thesis, namely employee engagement, organisational outcomes (task and citizenship performance), supervisor dark triad (Machiavellianism, psychopathy, and narcissism), and ICT adoption. The purpose of the theoretical review was to provide theoretical bases for establishing what theories already exist, the relationships between them, to what degree the existing theories have been investigated, and to develop new hypotheses to be tested. It is also done to highlight the lack of appropriate theories or reveal that current theories are inadequate for explaining new or emerging research problems (Kennedy, 2007). The theoretical review discusses three relevant theories that underpin this thesis: job demand-resource theory, affective events theory, and activation theory. The chapter concludes by providing a concise overview that highlights the key points presented throughout the chapter.

2.2 Conceptual Review

This section assesses the key concepts derived from this thesis and starts by examining the different viewpoints on employee engagement, followed by organisational outcomes (such as task and citizenship performance), supervisor dark triad traits, and information and communication technologies.

2.2.1 Employee engagement

Employee engagement, traditionally rooted in Human Resource Management (HRM), has grown to encompass various business, service, and operational outcomes, making it a multi-faceted area of study. The vast body of academic literature spanning over 30 years reflects this diversity through myriad definitions, titles, theoretical frameworks, and measuring instruments (Turner, 2020; Shuck, 2019; Motyka, 2018; Bailey et al., 2017; Imperatori, 2017; Saks and Gruman, 2014; Kahn, 1990). Practitioner research has also shown considerable variation (Gallup, 2021; Quantum Workplace, 2020; The

Predictive Index, 2019; Willis Towers Watson, 2018; Aon Hewitt, 2017). This literature review commences with definitions from various scholars, transitions into Shuck's (2011) four emerging perspectives on employee engagement, and examines both the antecedents and outcomes of employee engagement.

Eiampradispon and Eaknarajindawat (2021:38-39) characterize employee engagement as an employee's positive attitude towards an organization and the willingness to make sacrifices to help the organization achieve its goals. They emphasize loyalty towards the employer, especially in times of crisis, which can stem from long-term tenure, a sense of belonging, or received benefits. However, the researcher find this definition lacking depth in capturing the cognitive and behavioral dimensions that are critical for a holistic understanding of engagement. Kahn (1990:694), one of the pioneers in this field, defined engagement as the personal involvement of an individual's preferred self, where organizational members harness their selves to their work roles. Kahn elaborates that engagement involves people employing and expressing themselves physically, cognitively, and emotionally during role performance (Amah & Sese, 2018; Alfesa, 2013; Mehta et al., 2016). His criteria of psychological safety, meaningfulness, and availability provide a comprehensive framework. Yet, while pioneering, Kahn's model may oversimplify the dynamic and fluctuating nature of engagement over time.

Maslach and Leiter (1997:417) define engagement as a persistent positive affective state characterized by high activation and pleasure. Their focus on engagement is valuable for highlighting the emotional aspects. However, the researcher believes this definition may not sufficiently address the cognitive and behavioral components that are integral to a well-rounded understanding of engagement. Rothbard (2001:656), expanding on Kahn's (1990:694) concept, describes engagement as a psychological presence in role activities, emphasizing the need for participation and attention. While insightful, this definition may still overlook the broader organizational and contextual factors influencing engagement.

Employee engagement has also been viewed by Schaufeli, Salanova, Gonzalez-Roma, and Bakker (2002:74) as involving an individual's full identification with their work, including aspects like vigor (energy and resilience), dedication (significance and motivation), and absorption (being fully involved in work tasks). Their

multidimensional approach offers a robust framework for understanding engagement. This definition is comprehensive and widely used, though it may not fully account for individual differences and contextual nuances.

Saks (2006:602) describes engagement as a distinct construct involving cognitive, emotional, and behavioral elements linked to individual performance. This concept integrates Kahn's (1990:694) and Schaufeli et al. (2002:74) definitions, suggesting that engagement arises from the interplay of physical, emotional, and cognitive aspects, and encompasses both job and work engagement. While it is particularly useful for linking engagement to individual performance, the practical application of this model can be complex, requiring sophisticated measurement tools.

Additionally, Macey and Schneider (2008) provide a comprehensive classification of employee engagement as a favorable state serving organizational goals, encompassing participation, dedication, ardor, excitement, concentrated endeavor, and vitality. Though broad and inclusive, it may be criticized for being too general, potentially diluting the specific aspects of engagement. Rich et al. (2010:619) define employee engagement as the manifestation of personal physical, cognitive, and emotional energy invested in professional roles. This definition offers a clear and actionable framework. Nonetheless, it might be too focused on the individual level, not adequately addressing organizational influences.

Furthermore, Saks (2011:329) asserts that engaged employees exert full effort towards both main job tasks and extra-role behaviors. This perspective underscores the importance of measuring both job and work engagement, though it might require more empirical validation in diverse contexts. Reio and Sander-Reio (2011:464), aligning with Kahn (1990:694) and Rothbard (2001:656), highlight psychological presence during organizational roles, emphasizing a positive orientation towards the organization. This definition, while valuable, may need further elaboration on how psychological presence translates into measurable outcomes.

Describing engagement as a positive, fulfilling cognitive state, Selma (2013:97) aligns it with contemporary views on engagement but may be too narrow by not fully incorporating the emotional and behavioral dimensions. In contrast, Swanberg et al.

(2011:614) see engagement as a positive work-related psychological state of fulfillment, characterized by vigor, dedication, and absorption. Their definition resembles Schaufeli et al. (2002:74), as both highlight the key aspects of vigor, dedication, and absorption and provides a solid framework. However, it may not address the broader organizational factors that impact engagement. Arrowsmith and Parker (2013:2709) define employee engagement from a unitarist human resources perspective, emphasizing the recognition and representation of employee interests but may be limited in addressing the complex and multifaceted nature of engagement across different organizational contexts, including technical universities in Ghana.

Shuck et al. (2014:240) define employee engagement as an active, work-related positive psychological state contextualized by cognitive, emotional, and behavioral energy directed towards organizational outcomes. This definition, which incorporates Saks' multidimensional framework and builds on early research (Schaufeli et al., 2002; Maslach et al., 2001; Kahn, 1990), reflects a dynamic mental state encompassing all aspects of work experience. According to Shuck et al. (2014:240), an employee's engagement level is shaped by daily work experiences and interactions within the organization. The researcher finds Shuck et al.'s (2014) conceptualization particularly compelling for this study.

The choice of Shuck et al.'s (2014) definition of employee engagement for this study is driven by its comprehensive, multidimensional, and dynamic nature. Unlike definitions that focus primarily on emotional aspects (Maslach & Leiter, 1997) or cognitive presence (Rothbard, 2001), Shuck et al.'s framework integrates cognitive, emotional, and behavioral dimensions. This holistic approach provides deeper insights into how different factors, such as supervisor behavior and ICT adoption, influence engagement. This is particularly relevant in complex educational settings like Ghanaian Technical Universities, where employees' roles are varied and multifaceted.

By adopting Shuck et al.'s dynamic and context-sensitive framework, this study can better account for the unique cultural and organizational dynamics of Ghanaian Technical Universities. These universities operate within a dynamic and evolving educational landscape in Ghana, facing challenges such as resource constraints, changing educational policies, and the need to integrate technology in teaching and

administration. Shuck et al.'s framework, which considers daily work experiences, is particularly apt for understanding how these factors influence employee engagement.

For instance, while Kahn (1990) emphasizes psychological safety, meaningfulness, and availability as key to engagement, his model may oversimplify the dynamic and fluctuating nature of engagement over time. Shuck et al.'s (2014) definition, however, captures these fluctuations by considering how daily work experiences shape engagement. This makes it particularly suitable for the constantly changing environment of Ghanaian Technical Universities.

Similarly, Schaufeli et al. (2002) describe engagement as involving vigor, dedication, and absorption. While this multidimensional approach is robust, it does not fully account for individual differences and contextual nuances. Shuck et al. (2014) address this gap by providing a more dynamic framework that can accommodate the specific challenges and evolving nature of Ghanaian Technical Universities.

In contrast, definitions by Macey and Schneider (2008) and Rich et al. (2010) focus heavily on individual-level engagement without adequately addressing organizational influences. Shuck et al.'s (2014) definition, by considering the organizational context and daily interactions, provides a more actionable framework for improving employee engagement in a complex and evolving environment.

These attributes make Shuck et al.'s definition particularly suitable for exploring employee engagement in the context of Ghanaian Technical Universities. By capturing the cognitive, emotional, and behavioral aspects of engagement and considering the daily work experiences and unique cultural context, this framework provides a robust foundation for understanding and enhancing employee engagement in this setting. The findings based on Shuck et al.'s perspective can offer more actionable recommendations for improving employee engagement, considering the full spectrum of engagement dimensions and their interactions.

In this study, employee engagement is defined as the degree to which employees at Ghanaian Technical Universities demonstrate a proactive and optimistic psychological state, as evidenced by their positive thoughts, emotions, and behaviors in relation to their work. This definition reflects the comprehensive, dynamic, and context-sensitive

nature of Shuck et al.'s (2014) framework, making it well-suited for the complex and evolving environment of Ghanaian Technical Universities. The next section considers the approaches of employee engagement.

2.2.2: Perspectives /Approaches of Employee Engagement

Kahn's (1990) needs-satisfying approach is the first perspective on employee engagement and views engagement as an internal state influenced by external environmental effects, with fundamental needs satisfaction being crucial to the development of engagement. The research characterises engagement at work as a variable encompassing the extrinsic and internal motivational spectrums of a person's effort to maintain their individuality at work. Each individual perceives internal and external events differently (Kahn, 1990).

The second approach, known as the "burnout-antithesis method," is based on the burnout literature and contends that engagement is the opposite of job burnout (Gonzalez-Roma et al., 2006; Maslach et al., 2001). Maslach et al. (2001) defined engagement as a prolonged, pleasant emotional state marked by high activation and pleasure levels (Shuck 2011, p. 309). In order to engage workers, burnout research first looked at how to maximise human potential for wellbeing; hence, this approach sees burnout as a depletion of engagement. Schaufeli, et al. (2002), who renamed the state of engagement (Kahn, 1990) as work engagement, examined the Maslach et al. (2001) paradigm. This strategy gives rise to the concept of "work engagement" (Schaufeli, et al., 2002).

The third view point, the "satisfaction-engagement approach," is the first to establish a connection between engagement and profitability, and it investigates engagement satisfaction at the business unit level (Harter et al., 2002). According to the studies cited in this approach, companies can expect positive results if they adopt employee engagement programmes (Asplund et al., 2015; Xanthopoulou et al., 2009; Arakawa & Greenberg, 2007; Wagner and Harter, 2006). As an outgrowth of the positive psychology movement, this strategy advances the inclusion of well-being as a significant engagement factor (Johnson et al., 2018; Shuck & Reio, 2014; Robertson and Cooper, 2009).

The fourth approach to employee engagement is multidimensional. The approach states that participation in work grows through a social exchange model as well as cognitive, emotional, and behavioural factors (Harter et al., 2002; Kahn, 1990; Maslach et al., 2001; Maslow, 1970). Saks (2006) was the first academic researcher to propose two distinct forms of employee engagement: job engagement and organisational engagement, both of which he believed formed through a social exchange paradigm. This approach integrated prior research suggesting that employee engagement is comprised of cognitive (Maslach, 2001; Kahn, 1990; Maslow, 1970), emotional (Harter, 2002; Kahn, 1990), and behavioural components (Harter et al., 2002; Maslach et al., 2001; Kahn, 1990). This method ties together causes and effects (Saks, 2006) and thinks about trait, state, and behaviour engagement (Macey & Schneider, 2008).

In sum, these perspectives provide the basis for academic frameworks of employee engagement: Kahn's (1990) need-satisfying method, Maslach et al.'s (2001) burnout-antithesis, Harter et al.'s (2002) satisfaction-engagement, and Saks's (2006) multidimensional approach. The next section reviews the sub-dimensions of employee engagement based on Shuck et al.'s (2014) definition and discusses the practical implications related to employee engagement.

2.2.3: Sub Dimension of Employee Engagement

This section aims to provide a nuanced understanding of the three sub dimensions based on Shuck et al. (2014) definition of employee engagement. They are cognitive, emotional and behavioural engagement.

2.2.3.1 Cognitive Engagement

Cognitive engagement is the degree of mental energy directed towards achieving desired organizational goals (Shuck, Adelson, & Reio, 2017; Shuck et al., 2014; Rich et al., 2010). It encompasses the mental effort and investment individuals put into their tasks and activities, involving active information processing, critical thinking, and making connections to enhance learning and performance. Cognitively engaged personnel are alert, focused, and concentrated on their tasks, which Kahn (1990) describes as the focus, attention, and concentration on work-related tasks, events, and circumstances. An intellectually engaged employee is deeply immersed in work-related

events, whether that involves their specific tasks, job roles, or broader organizational activities.

Studies indicate that cognitive engagement is correlated with higher levels of academic accomplishment (Fredricks et al., 2004) and job performance (González-Romá et al., 2006). Individuals that are cognitively engaged have improved abilities in deep learning, critical thinking, and problem-solving (Wang & Holcombe, 2010). Moreover, there is a correlation between cognitive engagement and increased work satisfaction as well as decreased turnover intentions, as stated by Saks (2006).

Motivation plays a crucial role in stimulating cognitive effort and maintaining perseverance. Highly motivated individuals are more likely to dedicate cognitive effort to their work. Bandura (1997) emphasizes that self-efficacy beliefs, or confidence in one's ability to effectively complete tasks, significantly impact cognitive engagement. Both classroom and workplace settings are essential for fostering cognitive engagement. Creating supportive and challenging learning environments can promote active learning, autonomy, and mastery objectives in students (Skinner et al., 2008). Similarly, in professional environments, factors such as job role structure, task independence, and opportunities for skill enhancement contribute to employees' mental involvement (Bakker et al., 2012).

While the existing literature provides a robust foundation for understanding cognitive engagement, several limitations and areas for further research emerge. For instance, much of the research focuses on specific settings, such as classrooms or Western corporate environments, (Fredricks, et al. 2004, Kahn, 1990, Saks 2006, Shuck et al. 2017,) potentially overlooking contextual variations in other regions or sectors, such as Ghanaian Technical Universities.

This study aims to provide a nuanced understanding of cognitive engagement within Ghanaian Technical Universities. This approach will help identify specific factors that enhance cognitive engagement in this context, offering insights into how academic staff and administrators can optimize their mental investment in their roles to achieve better organizational outcomes.

2.2.3.2 Emotional Engagement

Emotional engagement refers to the degree to which employees have a strong and enthusiastic emotional commitment towards achieving positive outcomes for their organization (Macey & Schneider, 2008; Shuck et al., 2014). It involves employees' emotional attachment, involvement, and commitment to their work (Kahn, 1990). Employees who are emotionally engaged feel positive or negative emotions towards their job and organization, significantly influencing their work behavior and attitudes.

Research has shown that emotional engagement is positively related to job satisfaction, organizational commitment, and the intention to stay with the company (Rich et al., 2010). Emotional engagement also correlates with higher work performance (Salanova, Agut, & Peiró, 2005) and employee well-being (Saks, 2006). For example, Harter, Schmidt, and Hayes (2002) found that emotionally engaged employees experience more positive emotions at work, leading to increased job satisfaction and better performance. These employees are also more likely to be committed to their organization and have a lower intention to leave (Saks, 2006).

Several factors contribute to emotional engagement, including leadership styles, organizational culture, job characteristics, and employee well-being (Macey & Schneider, 2008). Positive leadership styles, such as transformational leadership, enhance emotional engagement by fostering a supportive and motivating environment (Macey & Schneider, 2008). Conversely, negative leadership styles, such as abusive supervision, detract from emotional engagement (Tepper, 2000).

2.2.3.3 Behavioural Engagement

Behavioral engagement refers to the extent to which employees demonstrate positive work behaviors, such as going above and beyond the minimum requirements of their job, taking initiative, and being proactive in problem-solving (Christian et al., 2011). This form of engagement manifests as the psychological condition of intending to behave favorably towards one's work and organization (Shuck et al., 2017; Rich et al., 2010; Macey & Schneider, 2008). Behaviorally engaged individuals exhibit a willingness to exert extra effort for their team and employer, a concept that Macey and Schneider (2008) termed proactive engagement. They describe it as a progressive

psychological condition that manifests in behavioral tendencies even without actual action.

Behavioral engagement is positively associated with job performance. For instance, Bakker et al. (2012) found that behaviorally engaged employees exhibited higher levels of task performance and organizational citizenship behavior (OCB), which includes voluntary actions that benefit the organization. Similarly, Christian et al. (2011) found a positive relationship between behavioral engagement and both task performance and OCB.

Again, various employment resources, such as support from supervisors and colleagues, feedback mechanisms, and opportunities for personal and professional development, significantly influence behavioral engagement (Saks, 2006). Xanthopoulou et al. (2007) demonstrated that social support from supervisors positively correlates with employee behavioral engagement.

Extant literature highlights that behavioral engagement positively correlates with several favorable outcomes, including enhanced job satisfaction, increased organizational commitment, and reduced turnover intentions (Macey & Schneider, 2008). This suggests that fostering behavioral engagement can substantially impact organizational outcomes at technical universities.

2.2.4 Antecedent of Employee Engagement

Employee engagement, a critical factor in organizational success, has been extensively studied in terms of its antecedents. Understanding what drives engagement can help organizations foster a more motivated and productive workforce. This review synthesizes the literature on the key antecedents of employee engagement, drawing from various theoretical frameworks and empirical studies.

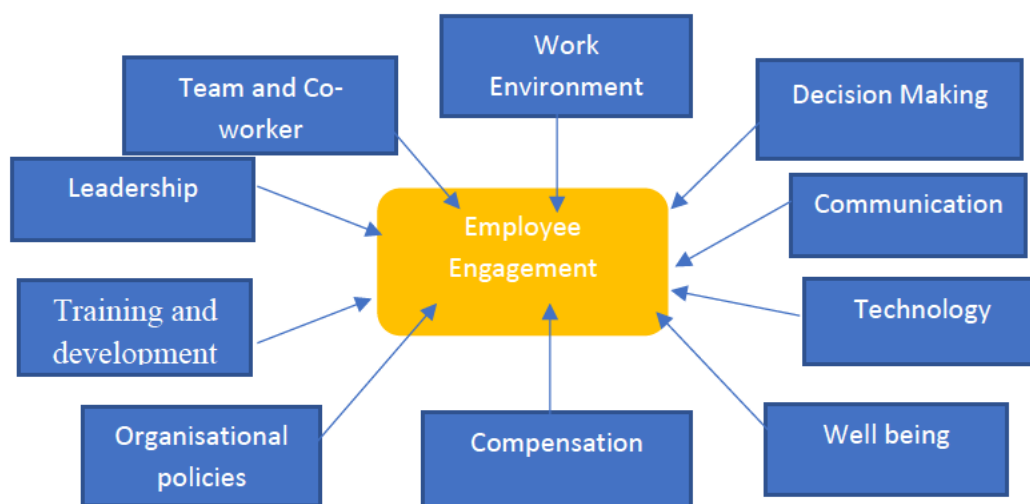


Fig 2.1: Antecedents of employee engagement

The nature of the workplace is a crucial factor in determining an employee's level of engagement. Research by Miles (2001), Harter et al. (2002), Holbeche and Springett (2003), May et al. (2004), and Rich et al. (2010) has found that employee engagement is influenced by various workplace characteristics. Managers who create a pleasant workplace demonstrate empathy for employees by listening to their problems, delivering constructive criticism, and encouraging employees to develop new skills and discover solutions to workplace challenges (Deci & Ryan, 1987). A workplace that provides employees with a sense of purpose and allows them to work in peace and focus can significantly affect employee engagement.

Co-workers and team members are essential to the development of a highly engaged workplace. According to Simpson (2009), helpful interpersonal interactions are directly related to employee engagement. Kahn (1990) found that team support and trustworthy interpersonal interactions make employees more engaged. Relationships within a team are built on acceptance, friendship, and loyalty, which leads to trust (Fiedler, Chemers, & Mahar, 1997). There is a strong link between employee engagement and the supervisor, the team, and the other workers (Ariani, 2015). How people work together on a team and with their co-workers affects their commitment to their jobs (Ducharme & Martin, 2000; Hackett & Guion, 1985; Bass, 1985; Bernard & Avolio, 1990). May et al. (2004) revealed a significant impact of workplace relationships on the construct of meaningfulness, a key element of employee engagement.

Leadership quality is another significant element in worker engagement. Effective leadership requires self-awareness, integrated handling of information, interpersonal honesty, and ingrained moral principles (Walumbwa et al., 2008). Employee engagement increases when leaders inspire their teams (Wallace & Trinko, 2009). Macey and Schneider (2008) suggest that leaders may influence employee engagement by instilling a sense of commitment to the workplace. This can happen when leaders clearly communicate goals, treat employees fairly, and recognize good work. When workers believe their efforts matter, they are more invested. Having a genuine and supportive supervisor may make employees happier at work (Schneider et al., 2009).

Career advancement and training are critical for employee engagement. Training improves service accuracy, influencing performance and increasing worker engagement (Paradise, 2008). Bakker and Bal (2010) found that opportunities for development predicted job engagement, while Eldor and Harpaz (2016) discovered that learning opportunities promoted engagement through a positive learning atmosphere. Learning and development opportunities are significant job resources for boosting engagement (Bakker & Xanthopoulou, 2013).

Policies, processes, structures, and systems also determine employee engagement. Pleasant organizational norms and processes are vital for engagement and company goals. Fair recruiting and selection, flexible scheduling, work-life balance support, and equal progression guidelines are important. Recruitment policies affect future employees' engagement (Schneider et al., 2009). Flexible work-life policies boost engagement (Richman et al., 2008). Organizations with flexible work arrangements are more likely to have engaged staff (Woodruffe, 2005; Rama Devi, 2009).

Compensation is a crucial factor in fostering employee engagement. Attractive remuneration encompasses salary, bonuses, and other monetary incentives, alongside non-financial benefits such as increased vacation allowances and gift programs. Recognition and rewards are critical precursors to engagement (Saks & Rotman, 2006). Employees who receive praise and acknowledgment from their employer feel obligated to reciprocate by increasing their engagement. Kahn (1990) posits that employee participation depends on their perceptions of the benefits they receive. To achieve high employee engagement, organizational leadership must ensure adequate remuneration and recognition.

Workplace wellbeing encompasses factors that enhance employee engagement. Wellbeing is an important measure of an organization's influence on its workforce (Rath & Harter, 2010). The primary factor influencing employee engagement is the level of concern exhibited by senior management towards employees' overall well-being (Towers Perrin Talent Report, 2003).

Technology significantly enhances employee engagement by facilitating communication, providing instantaneous feedback, and promoting a better working environment (Jha, Sareen, & Ponturu, 2018). Technology also prevents duplication of effort, accelerates productivity, and improves customer relationship management (Devi & Jyothsna, 2014).

Employee communication is strongly related to engagement (AbuKhalifeh & Som, 2013). Poor communication hinders engagement because workers lack trust in the organization (Keegan, 2015). Open and regular communication gains employees' trust and respect (Kruse, 2012). Effective employee communication improves engagement and reduces turnover intentions (Kang & Sung, 2017). Two-way communication where employees can voice their opinions makes them feel included and more engaged (Larkin, 2009).

Many employees are underutilized due to a lack of involvement in decision-making (Robinson, 2006). Employee participation in decisions impacting their work is a key driver of engagement (Purcell, 2003). Employee engagement in decision-making is a core HR Management premise (Beardwell & Claydon, 2007). Collecting employees' ideas and gaining their willingness to engage is crucial.

In summary, the antecedents of employee engagement are multifaceted, encompassing workplace characteristics, interpersonal relationships, leadership quality, career advancement and training, organizational policies, compensation, workplace wellbeing, technology, communication, and employee involvement in decision-making. Understanding and addressing these factors can help organizations create a more engaged and productive workforce, leading to improved organizational outcomes and overall success.

2.2.5 Consequences of Employee engagement

Multiple studies have revealed positive and negative links between employee engagement and organizational outcomes in several research. For instance, Bakker Demerouti, and Cooper (2012) examined 144 workers' job performance to determine the influence of work engagement. Their findings revealed a positive relationship between work engagement and contextual performance ($b=.40$, $t=2.54$, $p<0.05$) and task performance ($b=.45$, $t=2.94$, $p<0.01$). Again based on 283 UK consulting business workers, Shantz et al. (2013) found that engagement leads to greater task and citizenship performance, but deviant conduct is a negative effect. In UK construction and consultancy organisation, data from the Human Resources department revealed that work engagement was adversely connected to voluntary absence (Shantz and Alfes, 2016). According to a different study, job engagement had a favourable effect on emotional commitment and extra-role performance, but a negative effect on turnover intentions among a sample of Iranian frontline employees (Karatepe, 2013). Shuck et al. (2014) discovered that work engagement decreased workers' intentions to leave the health care business. In addition, Albrecht and Andreatta (2011) verified the direct and indirect effects of job engagement using a sample of 139 health sector personnel. This study revealed that employees who are engaged would feel driven and have a feeling of affective commitment; as a result, they will be less likely to consider quitting the firm. Schaufeli and Bakker (2004) found that employee engagement decreased turnover intentions in the presence of job resources for 1698 employees from four different vocations. They stated that job resources would minimise job demands, boost work engagement, and reduce turnover intentions. Yalabik et al. (2013) found that job performance is a favourable effect of work engagement among 167 UK bank employees. 297 workers in a UK service sector business agreed that employee engagement decreased turnover intentions (Alfes et al., 2013).

Multiple studies (Hoon Song et al., 2014; Findley Musgrove et al., 2014; Innanen et al., 2014; Shuck and Reio, 2014; Lee et al., 2014; Menguc et al., 2013; Barnes and Collier, 2013) suggested that the presence of high levels of employee engagement improves employee performance, team performance, service climate, life satisfaction. Many academics have, however, suggested that job engagement may be able to counteract poor employee performance. As an illustration, Shuck and Jr. (2014) examined the data of 216 healthcare workers from the USA, Canada, and Japan and discovered that

employee involvement had a detrimental effect on depersonalization and emotional tiredness.

Halbesleben & Wheeler (2008b) however, found no link between engagement and performance. They surveyed 587 U.S. workers from various sectors and occupations. There were moderate associations seen between job engagement and performance evaluations as reported by individuals themselves, their supervisors, and their co-workers. This implies that although there is a noticeable effect of job engagement on employee performance, its influence may be rather limited. This suggests that the promotion of goal-setting procedures may have the potential to increase levels of engagement among those with optimistic tendencies, hence resulting in improved individual performance.

Several research have also examined an indirect correlation between engagement and performance. An example of a study done by Medlin and Green (2009) involved investigating the interplay of goal-setting, optimism, job engagement, and individual performance among a sample of 426 workers. The results of their study indicated that the establishment of goals had a beneficial influence on individuals' level of involvement and commitment to their job.

The concept of engagement has attracted considerable interest from both professionals in organisations and academic researchers. According to Quinones, Van Den Broeck, and De Witte (2013), employees who are engaged demonstrate enhanced job performance and increased production, hence making a good contribution to organisations. According to Truss (2006b) as cited by the Chartered Institute of Personnel and Development, engaged workers exhibit qualities such as enthusiasm, profound immersion in their jobs, active participation, devotion, and wholehearted commitment. According to Macey et al. (2011), when individuals get more engaged, there is a tendency for their performance to improve. Due to its inherent importance, engagement is a pivotal facet of the employer-employee dynamic that necessitates concerted endeavours from all parties involved.

The next part provides an in-depth analysis of the research on organisational outcomes, specifically focusing on task and citizenship performance.

2.3 Organizational Outcomes

Organizational outcomes are critical indicators of an organization's effectiveness and efficiency. Organizational outcomes refer to the results of the collective actions and performance of an organization, including both tangible and intangible outcomes such as financial performance, productivity, job satisfaction, employee turnover, and customer satisfaction (Mishra & Sahoo, 2016). Organizational outcome means a demonstration by an organisation of actions taken by the organization to provide for services or support to clients (Law Insider, 2021). This section provides an overview of the existing research on two primary categories of organisational outcomes: task performance and citizenship performance. Both factors are crucial for the overall achievement and long-term viability of organisations, especially in the context of higher education institutions like technical universities.

2.3.1 Task performance

Performance pertains to the conduct and behaviors exhibited by employees (Aguinis, 2018), encompassing both advantageous and detrimental contributions to the organization (Colquitt, Lepine, & Wesson, 2014). Dessler (2011) elucidates that performance embodies job-related actions that employees are expected to undertake and the degree to which these tasks are effectively accomplished. It encompasses the realization of measurable organizational goals (Armstrong, 2006). Performance components may be found in the following points (Al Shobaki, Abu-Naser, El Talla, & Amuna, 2018: 5; Al-Sakran, 2004):

1. General knowledge, technical and professional abilities, general employment background, and related sectors.
2. Work quality: The degree to which an individual is conscious of their work, their desire, technical talents, skill, and capacity to organize and carry out work without errors.
3. The amount of work done: The quantity of work an employee can do in typical working conditions, as well as the speed with which it is completed.
4. Perseverance and dependability: Includes seriousness and dedication to work, the employee's ability to take responsibility for the work and complete it on time, the extent of the employee's need for guidance by supervisors, and the evaluation of the results of their work.

Staff performance is one of the most influential factors on the operational sciences of independent variables, playing a crucial role in organizational success (Al Shobaki, Abu-Naser, Amuna, & El Talla, 2018; Jameel & Ahmad, 2020b: 2401). This research focuses on task performance, a pivotal element within organizations, as it unveils the proficiency and success of both teams and individual employees in attaining predetermined organizational objectives. The scope of performance within employment encompasses diverse categories of professionals, including healthcare workers (doctors, nurses), educators, law enforcement personnel, and others.

Task performance refers to an employee's effectiveness in completing core job or role-based responsibilities (Conway, 1999:11). Motowidlo and Van Scotter (1994:479) define task performance as the required outcomes and behaviors that directly serve the goals of the organization. It includes meeting company objectives and effective sales presentations, varying between jobs within the same organization. Rotundo and Sackett (2002:70) describe task performance as individuals' behaviors that contribute to organizational goals. This definition aligns with Motowidlo and Van Scotter (1994:479), emphasizing that task performance involves actions contributing to the goals of any organization.

Rank, Nelson, Allen, and Xian (2009:472) define task performance as the adequate fulfillment of technical requirements and task-specific efforts or behaviors associated with the execution or completion of a required function or unit of work. This definition parallels Conway (1999:11), underscoring an employee's effectiveness in completing required functions or units of work. Geue (2018:278) notes that task performance concerns the fundamental, technical, or formal parts of work (Rich et al., 2010) and that positive attitudes and behaviors are beneficial (Kluemper, Little, & DeGroot, 2009). Shin, Hur, and Kang (2016:498) define task performance as the quality and quantity recognized by an organization's formal human resource management system. Their definition contributes to the literature by conceptualizing task performance as activities recognized by an organization's formal HR management system. Mom, Fourné, and Jansen (2015:138) define task performance as how employees formally and informally develop and use their knowledge and skills to best carry out tasks.

From these definitions, it is evident that task performance encompasses: (1) behaviors, efforts, or activities associated with completing core job or role-based responsibilities,

(2) contributing to organizational goals, and (3) recognized by an organization's formal HR management system. Consequently, in this study, task performance is defined as the behaviors of technical university employees related to their core job tasks (teaching, research activities, and administrative work), recognized by the technical universities' formal HR management system, and contributing to the achievement of organizational objectives. This definition is chosen for its comprehensive nature, encompassing various dimensions critical to understanding and measuring task performance in the context of Ghanaian Technical Universities. It is multidimensional, goal-oriented, recognized by formal HR systems, and includes both technical skills and positive work behaviors.

The definitions by Conway (1999), Motowidlo and Van Scotter (1994), and Rank et al. (2009) collectively emphasize the multidimensional nature of task performance. Conway (1999) highlights the core job responsibilities, while Motowidlo and Van Scotter (1994) and Rank et al. (2009) focus on goal-oriented behaviors and technical requirements. This study agrees with these perspectives, recognizing that task performance is not just about completing tasks but doing so in a way that aligns with organizational goals.

The following section will delve into the specific dimensions of task performance, providing a detailed analysis of how these behaviors manifest in the context of technical universities.

2.3.1.1 Dimensions of Task performance

Task performance is a multifaceted construct that encompasses various dimensions critical to achieving organizational goals. These dimensions highlight different aspects of how employees contribute to their organizations through their job-related behaviors and outcomes. The primary dimensions of task performance as opined by Borman, Ackerman, and Kubisiak's (1994) include task proficiency/quality, production/efficiency, and judgment/problem solving.

2.3.1.2 Task Proficiency/Quality

Task proficiency/quality refers to the level of expertise or mastery that an employee has in performing a task or job. According to Borman, Ackerman, and Kubisiak (1994),

this aspect of task performance involves exhibiting mastery of job duties, demonstrating correctness in one's work, paying attention to details while avoiding oversights and errors, and achieving a high level of quality in output. Individual task proficiency encompasses formalizable actions apart from the social environment, demonstrating how well an employee meets the standards and recognized expectations of their unique position (Griffin, Neal, & Parker, 2007:331).

Research by DeNisi and Griffin (2017) found a positive correlation between task proficiency and job performance, contributing to overall organizational effectiveness. Similarly, Borman and Motowidlo (1997) highlighted task proficiency as a robust predictor of job performance across diverse occupations. Bakker and Demerouti (2014) determined that task proficiency significantly predicts worker engagement, noting that individuals excelling in their job responsibilities tend to experience favorable emotions and a heightened sense of mastery, leading to elevated levels of engagement.

2.3.1.3 Production/Efficiency

Production/efficiency, as described by Borman et al. (1994), involves utilizing resources efficiently, conducting business in a manner that minimizes costs, making efficient use of time, adhering to deadlines, and consistently delivering a high volume of work.

2.3.1.4 Judgment/Problem Solving

Judgment/problem solving, according to Borman et al. (1994), is the ability to make sound judgments when confronted with challenges or impediments, accurately analyze situations or problems, determine the appropriate course of action based on available information, and successfully resolve issues by making informed decisions.

2.3.1.5 Factors Influencing Task Performance

Employee job performance and contextual performance are critical for achieving organizational excellence in today's competitive corporate climate. Research indicates that organizational characteristics, individual factors, and job-related factors are primary predictors of employee success (Tabiu, Pangil, & Othman, 2016; Barrick et al., 2001; Cote & Miners, 2006; Pushpakumari, 2008). Studies on individual factors include

personality (Abdullah et al., 2013; Rothmann, 2003), engagement (Anitha, 2014), commitment (Memari, Mahdieh, & Marnani, 2013; Susanty et al., 2013), and emotional intelligence (Kumar, 2014; Shooshtarian et al., 2013). Job-related factors examined include job stress (Chen, 2009; Yozgat et al., 2013), job satisfaction (Perera et al., 2014; Pushpakumari, 2008; Wright et al., 2007), and job experience (Kolz et al., 1998; Kotur & Anbazhagan, 2014).

Woods (2014) and Tarus (2014) list internal and external elements affecting performance, such as personal concerns, job security, achievement incentives, working conditions, job training, and performance feedback. Kappagoda (2018:162) identifies various factors influencing job performance, including experience, ability, performance feedback, pay increases, job security, leader behavior, group processes (Waldman & Spangler, 1989), individual characteristics (Susana, Pauline, Dean, & Awang, 2015), motivation (Mensah & Tawiah, 2016), organizational culture (Shahzad, 2014), effort (Mulki, Caemmerer, & Heggde, 2014), organizational structure (Robbins, 2003), leadership (Mulki, Caemmerer, & Heggde, 2014), organizational commitment (Jaramillo, Mulki, & Marshall, 2005), job involvement (Kappagoda, 2012), and job satisfaction (Kappagoda, 2012).

Koontz (1990) emphasizes the significance of comprehensive compensation systems, incorporating both financial (e.g., wages, salaries, bonuses, allowances) and non-financial aspects (e.g., training, healthcare, recognition, housing, meals) to potentially improve employee performance. Harzing (2004) argues that several crucial factors enhance performance, including aligning with organizational objectives, establishing personal achievement targets, providing consistent feedback, offering performance enhancement avenues, and maintaining a transparent connection between outcomes and rewards. This ensures personnel who achieve their goals are acknowledged and rewarded, enhancing morale.

In the academic context, activities such as teaching, scholarly publications, and social contributions determine a university's success (Jameel & Ahmad, 2020; Onuselogu & Adaobi, 2017). Abba and Mugizi (2018) emphasize the importance of education, research/publication, and community service for international development, noting improvements in social welfare, financial literacy, community safety, and crime reduction (Ahmad & Jameel, 2018; Preece, 2011). Research is a core reason for

establishing colleges, leading to new knowledge, technology development, service quality improvement, educational reputation enhancement, and economic value creation. University performance is largely determined by the work of academic and non-academic staff. Academic staff engage in teaching, research, and sometimes administration. Therefore, educational accomplishments are the primary criteria for evaluating a university's academic success (Jameel & Ahmad, 2019; Onuselogu & Adaobi P., 2017; Raewf & Thabit, 2018). According to Abba and Mugizi (2018), Igbojekwe and Ugo-Okoro (2015), and Tinuke (2015), academic achievement is influenced by staff skills, material resources, instruction, publishing, research, and community service. Publication is a crucial aspect of academic staff activity, potentially reducing organizational pressures (Jameel & Ahmad, 2019; Yousefi & Abdullah, 2019). However, the significance of teaching performance allows higher education institutions to educate students and lay the foundation for their future careers.

The subsequent section provides a comprehensive review of the literature on citizenship performance.

2.3.2 Citizenship Performance

The concept of citizenship performance originated from Dennis Organ's 1988 book "Organizational Citizenship Behavior." Since then, substantial empirical research has been dedicated to understanding the causes and predictors of Organizational Citizenship Behaviors (OCBs) (Klotz, Bolino, Song, & Stornelli, 2018; Rioux & Penner, 2001; Organ, 1997; Podsakoff & MacKenzie, 1997; Konovsky & Organ, 1996; Moorman, 1991; Williams & Anderson, 1991; Smith, Organ, & Near, 1983). Podsakoff, MacKenzie, Paine, and Bachrach (2000) describe citizenship performance as voluntary behaviors that contribute to organizational effectiveness, despite not directly affecting productivity. Borman (2004) adds that citizenship performance involves behaviors beyond task execution and technical competence, contributing to the social, psychological, and organizational context necessary for successful task completion. Özduran and Tanova (2017) highlight that citizenship performance includes discretionary efforts beyond formal job descriptions to enhance customer satisfaction.

From the foregoing, citizenship performance can be understood as:

1. Discretionary actions demonstrated by employees.
2. Actions not directly related to primary job duties.
3. Actions not officially recognized by the organization's human resource management structure.
4. Actions beyond the employee's official job description.
5. Actions that enhance customer satisfaction and organizational effectiveness.

In this study, citizenship performance refers to optional behaviors exhibited by technical university employees that are not directly linked to their primary job duties and are not formally recognized by the university's human resource management system, yet contribute to customer satisfaction and the organization's overall effectiveness.

The subsequent part will explore the distinct aspects of citizenship performance, offering a comprehensive examination of how these behaviours are demonstrated within the setting of technical universities.

2.3.2.1 Dimensions of Citizenship Performance

Although there is some disagreement among scholars, OCBs are often categorized into five dimensions: altruism, conscientiousness, sportsmanship, courtesy, and civic virtue (LePine, Erez, & Johnson, 2002). Additionally, Williams and Anderson (1991) distinguish between organization-centered (OCB-O) and individual-centered (OCB-I) OCBs. Coleman and Borman introduced a three-dimensional paradigm of interpersonal citizenship performance (ICP), organizational citizenship performance (OCP), and job/task citizenship performance (Mohan & Sophia, 2019).

2.3.2.1.1 Altruism

Altruism refers to the willingness of employees to help and assist their colleagues in completing tasks, even when it is not their responsibility. It is characterized by actions such as offering to help with tasks, assisting new hires, easing the strain on busy co-workers, and stepping in for absent employees (Organ, 1997; Smith, Organ, & Near, 1983). Altruistic individuals often rate their performance higher and experience more positive feelings as a result (Podsakoff et al., 2000).

2.3.2.1.2 Conscientiousness

Conscientiousness is the extent to which employees are dependable and responsible in performing their duties. It involves job devotion beyond official criteria, such as working long hours and volunteering for additional tasks (Organ, 1988). Conscientious employees consistently exceed expectations, adhere to regulations, and require minimal supervision (MacKenzie et al., 1993; Podsakoff & MacKenzie, 1997).

2.3.2.1.3 Sportsmanship

Sportsmanship is the willingness to tolerate minor inconveniences and setbacks without complaining or blaming others. It involves bearing inherent difficulties and impositions of work cheerfully and without protest (Organ, 1990b). Sportsmanship reflects an individual's determination to endure the inevitable irritations of organizational life without negative reactions (Organ, 1988).

2.3.2.1.4 Courtesy

Courtesy involves behaviors aimed at preventing interpersonal conflicts and minimizing future problems. It includes actions such as respect, politeness, and timely communication to avoid creating issues for co-workers (Organ, 1988; Podsakoff & MacKenzie, 1997). Courteous employees reduce intergroup disputes and make a sincere effort to facilitate smooth operations for their colleagues (Tambe & Shanker, 2014).

2.3.2.1.5 Civic Virtue

Civic virtue refers to constructive participation in a company's political life and support for its administrative functions (Deluga, 1998). It encompasses behaviors such as attending non-mandatory meetings, showing initiative for organizational improvements, and supporting reforms (Graham, 2000; Podsakoff et al., 2000). Civic virtue enhances performance quality and reduces customer complaints (Walz & Niehoff, 1996).

2.3.2.2 Individual and Organizational OCB

Research further divides the five characteristics of OCB into two categories: behavior directed towards individuals (OCBI) and behavior oriented towards organizations (OCBO) (Williams & Anderson, 1991). OCBI includes acts of generosity, civility, peacekeeping, and cheerleading directed at individuals. OCBO encompasses behaviors geared towards organizational benefits, such as conscientiousness, civic virtue, and sportsmanship. OCBI is linked to performance assessment ratings and reward distribution, while OCBO is associated with staff efficiency, organizational turnover, and employee productivity (Podsakoff et al., 2009).

2.4 Supervisor/Leader Dark Triad Traits

The phrase "Dark Triad" (DT), first used by Paulhus and Williams (2002), refers to a set of psychological traits—Machiavellianism, narcissism, and psychopathy—that collectively predict harm to interpersonal relationships (Rogoza & Cieciuch, 2018; Paulhus & Williams, 2002). These traits are associated with characteristics such as disagreeableness, emotional coldness, social aversion, heartlessness, selfishness, deception, and aggression (Paulhus, 2014; Furnham, Richards & Paulhus, 2013; Jones & Figueredo, 2013; Jonason & Krause, 2013; Ali et al., 2009; Austin et al., 2007; Jakobwitz & Egan, 2006; Paulhus & Williams, 2002). Individuals with DT traits tend to exhibit negative attitudes and behaviors at work, lacking altruistic or prosocial values (Cohen, 2016; Jonason, Slomski, & Partyka, 2012).

Supervisor Dark Triad is a psychological term explaining a supervisor's negative dispositions. Supervisors high on the dark triad tend to be achievement-oriented and skilled at accumulating power and extracting resources from their environment (Jones & Figueredo, 2013). They generally have a competitive nature and lack selfless concerns for the well-being of others. This concept comprises three sub-traits: Machiavellianism (a tendency to manipulate others for personal gain), psychopathy (a general lack of empathy), and narcissism (excessive self-love) (Myung & Choi, 2017). This study conceptualizes supervisor DT characteristics as undesirable personality qualities that result in adverse behavioral consequences.

In the following sections, each of these three sub-traits—Machiavellianism, psychopathy, and narcissism—will be explored in detail to provide a comprehensive understanding of their impact on supervisor behavior and organizational outcomes. By examining these traits individually, we can better understand their specific effects and how they contribute to the broader concept of the Dark Triad.

2.4.1 Machiavellianism

Machiavellianism is exemplified by manipulateness, a lack of conventional morality, and self-interest (Christie and Geis, 1970:23). In the view of Rauthmann (2012:487), Machiavellianism circumscribes tendencies of immoral, pragmatic, and cynical thinking, detached affect and coldness, agentic strivings (for instance, money, status, power, etc.), deceit, exploitation, and strategic long-term manipulation tactics. Machiavellianism has been found to correlate negatively with honesty-humility, agreeableness, and conscientiousness, and correlate positively with aggression, erratic behaviour, sex-related issues, socio-emotional deficits, poor well-being, interpersonal difficulties, morality problems, and antisocial tactics (Muris, Merckelbach, Otgaar and Meijer, 2017:189)

Supervisors who are high in Machiavellianism are driven by the perspective that the ends justify the means and have a strong need for money, power and competition (Zettler and Solga, 2013:552). According to Buckels, Jones, and Paulhus (2013:2207), they have gained recognition for their inclination to prioritise winning even if it comes at the detriment of others. Furthermore, Machiavellianism individuals exhibit a lack of moral restraint when it comes to participating in actions that deviate from societal norms, such as deceit, theft, and dishonesty, all with the intention of achieving victory. Additionally, they possess a high level of proficiency in concealing their genuine intentions, as highlighted by Cote, DeCelles, McCarthy, Van Kleef, and Hideg (2011:1078). Such persons also discount future consequences and have a need for immediate gratification—characteristics closely linked with the fast-life (Jonason and Tost, 2010:613). According to Volmer et al. (2016:413), Machiavellianism leadership has a negative impact on subordinates' career fulfilment, emotional wellbeing, and work satisfaction among German employees.

2.4.2 Psychopathy

According to Hare (2003:123), psychopathy circumscribes tendencies of insensitivity, interpersonal manipulation, impulsivity and thrill-seeking, as well as anti-social behaviours. Psychopathy is influenced by traits such as impulsivity, poor empathy, anxiety, absence of shame or regret, psychological shallowness, a sense of superiority, and a parasitic lifestyle that may encompass engagement in illegal behaviours (O'Boyle et al., 2012:574). Persons high in psychopathy lack normal levels of emotional arousal. They don't care much about their status and don't care about other people (Paulhus and Williams, 2002). Given their relatively limited ability to experience all but the most superficial and primal emotions, combined with cynicism, they are incapable of experiencing affective empathy. This, however, does not preclude them from understanding what drives people (that is, cognitive empathy), and makes them well suited to take advantage of others (Jonason and Krause, 2013:535). They often abhor social norms and enjoy going against the status quo (Mathieu, Hare, Jones, Babiak and Neumann, 2013:291). Myung and Choi (2017:1) showed that a leader's psychopathy traits are inversely connected to his or her view of corporate social responsibility. Again, Erkutlu and Chafra (2019:197) found that leader psychopathy positively influences organisational deviance, and negatively affects Turkish nurses' psychological safety.

2.4.3 Narcissism

Individuals exhibiting a high degree of narcissism lack empathy, are exploitative (Sinead, Catherine, Emily and Julian, 2018:213), and have a selfish orientation to relationships (O'Boyle et al., 2012:575) with a strong sense of entitlement which impairs their ability to experience empathy (Buss, 1999:51). They are preoccupied with their own needs, goals, and desires, and are defined as having a cognitive-affective preoccupation with the self (Westen, 1990:235). In interpersonal relationships, they exhibit less agreeableness, empathy, and gratitude with more anger, hostility and distrust of others, and are usually abrasive and dismissive in these interpersonal relationships (Sinead et al., 2018:227).

Narcissism can be exploitative and ruthless towards others with little to no empathy (Soyer, Rovenpor & Kopelman, 1999:298). They are prone to create conflict with others (Wallace & Baumeister, 2002:831). Narcissists are viewed as socially insensitive

(Back et al., 2013:1028), hostile, and selfish (Wurst et al., 2017:288). Twenge and Campbell (2009:121) argue that narcissism is absolutely corrosive to social relationships. In particular, narcissists typically initiate quick social relationships easily, but over time, their behaviours degrade the relationships substantially (Wurst et al., 2017:289).

In a study by Wang, Zhang, Ding, and Cheng (2018:653) it was discovered that supervisor narcissism had a strong favourable influence on Chinese employees' negative expectations and silence. According to Xiao, Liu, Zhou, and Chen (2018:1317), narcissistic leadership has a negative and significant impact on organisational identity and information sharing among Chinese employees. In a study by Chen, Cheng, Wang, and Li (2020:1) the results indicated a significant negative impact of leader narcissism on employees' inclination to take control, as assessed by their level of job engagement.

Nonetheless, individuals high in narcissism can also be charming, charismatic, confident, interpersonally skilled, entertaining, assertive, gregarious, bold, extroverted, and attractive to others (Giacomin and Jordan, 2016:19). While some scholars have positioned narcissism in a group of “dark triad” personality types (O’Boyle et al., 2012:563; Paulhus & Williams, 2002:560), it is not surprising that others refer to the “bright” and “dark” sides of narcissism (Back et al., 2013), “bad” and “good” aspects of narcissism (Malkin, 2015:89), or “healthy” and “destructive” narcissism (Lubit, 2002:131). Thus, narcissistic supervisor/leaders are successful and charismatic figures (Nevicka, Hoogh, Van Vianen, Beersma and McIlwain, 2011:923), which subordinates/followers may look up to, until they experience their dark side.

Exploring how these traits manifest within the leadership of technical universities and their implications for employee engagement and performance is thus relevant. The subsequent section reviews the literature on Information Communication Technology adoption.

2.5 Information Communication Technology (ICT) Adoption

Information and communications technology (ICT) encompasses a wide range of technical instruments and resources that are employed for the purposes of

communication, creation, dissemination, storage, and management of information. Technology, such as computers, cell phones, multimedia, network hardware and software (Anderson, 2008), the internet, and online review sites are all examples of what is collectively known as ‘information and communication technology’ (Qazi, Raj, Tahir, Cambria, & Syed, 2014b; Qazi, Raj, Tahir, Waheed et al., 2014c). ICT is regarded as the heart of education because of the role it has played in formal and informal settings, and public and private educational institutions (Blurton, 1999). Several researchers (Iqbal & Ahmed, 2010; Shaikh, 2009; Amjad, 2006) have argued that this century demands confidence and efficiency in ICT use in all fields, at both the academic and industry levels. Shaikh and Khoja (2011) supported this assertion that, to achieve success in education, employment, and everyday life, ICT should be considered an essential component in achieving the desired outcomes of education.

ICT adoption is defined by Corrales and Westhoff (2006) as “an individual's decision to either embrace or decline a specific innovation, as well as the degree to which this innovation is incorporated into the relevant context.” Similarly, Corrales and Westhoff (2006), and Li, Yang, Sun, and Sohal (2009), defined IT adoption as how much a company integrates a certain set of technologies into its processes so that they are ready to use (Evangelista, Mogre, Perego, Raspagliesi, & Sweeney, 2012). ICT adoption describes a company’s use of the internet for business innovation, and the usage of websites as a platform for internal and external communication (Narayanasamy, Santhapparaj, & Eze, 2008; Tan et al., 2009). Giotopoulos, Kontolaimou, Korra, and Tsakanikas (2017) described ICT adoption as a set of variables referring to a firm’s ICT intentions; the availability of ICT infrastructure; internet integration; and the use of e-commerce. The authors explain ICT intentions as the extent to which the organisation has implemented, or intends to implement, specific actions to establish ICT. ICT infrastructure is described as the number of ICT resources in place: an information resource management system; an information systems manager; a computer room; and a security back-up plan for information systems. Internet integration refers to the number of business functions that are supported by the utilization of the internet. Finally, e-commerce refers to the usage of e-sales and e-procurement activities in the organisation.

Based on the preceding examination of ICT adoption, the definition proposed by Corrales and Westhoff (2006) appears to be more applicable for this study. Therefore, this study adopts the definition of Corrales and Westhoff (2006) and defines ICT adoption as an individual's decision to either embrace or decline a specific innovation, as well as the degree to which the new technology is incorporated into that employee's job activities. This definition is particularly relevant for understanding how ICT adoption can influence employee engagement and organizational outcomes in the context of Ghanaian technical universities, providing a clear framework for assessing the integration and impact of technology within these institutions.

2.5.1 Factors that Influence Information Communication Technology Adoption

A growing corpus of research on ICT integration in education (Davis, 1989; Rogers, 1995/2003; Tornatzky and Klein, 1982; Lawrence and Tar, 2018) have explored the overall influence of these variables on the acceptance of technological innovation and have focused on elements like relative advantage, complexity, and simplicity of use. According to Aldheleai, Baki, Tasir and Alrahmi, (2019:8) the key aspects that can influence the integration of technology in educational settings were identified as workplace facilities and instructors' personal traits and abilities (Chai & Khine, 2006). Al Mulhim (2014) identified a number of obstacles that prevent teachers from utilising ICT in their instruction, including their attitude toward technology, reluctance to change, a lack of time, their lack of confidence in using technology, and their lack of technological knowledge and proficiency. Al Mulhim (2014) also cited the lack of access to technology, ineffective training, a lack of technical assistance, and the high cost of hardware and software as barriers to ICT integration in learning institutions. On the other hand, essential elements of ICT integration in teaching and learning include teacher competency, accessibility to ICT resources (software, hardware), professional development, and technical assistance. Ekundayo and Ajayi (2009) listed a few problems that are hindering the adoption of ICT in Nigeria, including a lack of ICT infrastructure and access, high consumer costs, high ownership costs, and unstable and insufficient electrical power supplies (Jibia and Ahmad, 2021:42).

Numerous theories attempt to account for why people adopt new technologies while others are not. The author of this study incorporated elements that were found to be

significant in prior studies of teachers' attitudes toward the usage of technology. The Technology Acceptance Model (TAM) espoused by Davis (1989) posits that the acceptability and usage of Information Systems in businesses are contingent upon individuals' views regarding the relevance and simplicity of use (Lu, Yu, Liu, & Yao, 2003). The TAM (Davis, 1989), which emphasised utility and perceived simplicity of use, has an immediate effect on how people think about using a system and an indirect effect on how people actually use the system (Davis, 1993). The model explains why instructors accept or reject ICT and how technical aspects impact their perceptions and attitudes. TAM says beliefs, attitudes, and intentions affect ICT adoption in education. The Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh, Morris, Davis, & Davis, 2003) framework was also considered for its emphasis on social impact and conducive conditions. Consequently, impression of utility, perceived simplicity of use, attitude toward usage, enabling conditions and social influence were considered to form the significant factors that influence ICT adoption.

2.5.1.1 Perceived Usefulness

According to David (1989) perceived usefulness pertains to an individual's belief that employing an Information system will enhance their work performance. A system that is deemed to be very beneficial has a strong correlation between its use and performance. Perceived usefulness has been expressed as positive or negative thoughts in regards to users' increased perceived performance as a result of using technology (Davis, 1989; C. C. Lin, 2013). Regarding the acceptability of technology, such as that used in e-governance, Hamid, Razak, Bakar, and Abdullah (2016) showed that characteristics including perceived usability and convenience of use were among the predictors of technology acceptance among people.

2.5.1.2 Perceived Ease of Use

The concept of perceived simplicity of use may be characterised as the extent to which an individual anticipates that utilising a certain technology would be straightforward, as stated by Verkasalo et al. (2010) and Lu et al. (2003). Davis (1989) posits that the acceptance of an application is more probable when it is designed to be user-friendly. The concept posits that the perceived ease of use and utility of a system are positively associated with its adoption, hence elucidating the factors that influence firms' acceptance or rejection of technological advancements. Based on a study administered

to academicians from both public and private universities in Malaysia, a strong correlation was seen between the perceived ease of use and assessed usefulness factors. According to Mahomed, McGrath, Yuh, Sidek, Ibrahim, and Othman (2018), their research revealed a noteworthy correlation between the Technology Acceptance Model (TAM) and the utilisation of email among academicians in both public and private universities in Malaysia. This suggests that individuals are more inclined to accept a technology if they perceive it to be user-friendly.

2.5.1.3 Attitude towards Use

Teachers' attitudes toward technology were impacted by the quality of the enabling circumstances (Teo, 2010), personal talents, and perceived ICT advantages. Positive attitudes about the use of ICT in education will result in enhanced ICT-based instruction and learning (Huang & Liaw, 2005). Authentic integration, according to Huang and Liaw (2005), is contingent upon instructors' attitudes toward technology and intent to implement it in the classroom. If teachers have a negative attitude about ICT, providing them with superior facilities might not be enough to change their attitudes. Therefore, teachers must be sure that technology can make their instruction more engaging, straightforward, motivating, and exciting (Huang & Liaw, 2005) and that it can aid student learning and performance improvement.

2.5.1.4 Facilitating condition

Facilitating circumstances are "environmental facilitators or impediments that influence a person's experience of work difficulty" (Teo, 2010). Facilitating environments are critical for ICT inclusion in education. Yildirim (2007:182) observed that having access to technology helps teachers use ICT pedagogically. According to Teo (2009b), good enabling environments have a positive impact on ICT usage attitudes, whereas poor conditions are barriers to ICT integration for teaching and learning (Lim & Khine, 2006).

Technical assistance is essential for condition improvement. There are helpdesks, hotlines, and online technical support available (Teo, 2009, 2010). On-call experts help handle hardware and software issues and maintain ICT equipment. Teachers can use ICT without worrying about unexpected breakdowns or wasting time updating hardware and software (Korte & Hüsing, 2006). Good facilitation is essential for ICT integration at all levels of school and for instructors' acceptance of ICT for instructional

purposes. Assessing the existing degree of facilitation at technical universities and its consequences for teaching and non-teaching staff who desire to integrate ICT into their core duties is vital.

2.5.1.5 Social Influence

Social influence refers to the alteration in an individual's cognitive processes, emotional responses, personal beliefs, or actions that arise from their engagement with other individuals or collectives (Mazuki, Omar, Bolong, D'Silva, Hassan, & Shaffril, 2013:135). According to Venkatesh et al. (2003:451), social influence refers to the degree to which an individual perceives that influential persons want them to adopt the new system in the context of technology acceptance. Social pressure, sometimes referred to as societal influence, encompasses the perceived impact exerted by the social environment to either engage in certain behaviours or abstain from engaging in others (Ajzen, 1991). Consequently, it was discovered that social influence had an impact on people's adoption of technology (Yang & Choi, 2001). Additionally, each person's desire to utilise technology is significantly influenced by how they believe others expect them to do so (Teo, 2010). Venkatesh et al. (2003) countered this claim by asserting that most of the time, an individual's impression of technology is comparable to that of their co-worker. The provided results highlight the significance of outside influences on human behaviour and intention. Therefore, it is crucial to consider how social influence factors impact the use of ICT in technical universities.

The conceptual review concludes with the operationalisation of the study variables.

The study had four variables, each with its own specific indicators:

1. Organisational Outcomes - Task Performance and Citizenship Performance (Dependent Variable)
2. Employee Engagement (Independent Variable)
3. Supervisor Dark Triad (Moderating Variable)
4. Information and Communication Technology Adoption (Mediating Variable)

Table 2.1 presents the details of the operationalization of the concepts used in the study.

2.6 Theoretical Review

This section examines the numerous ideas that have been developed to research and comprehend the correlations between the suggested study variables. The theoretical framework in this study is backed by Job Demand-Resource Theory, Affective Event theory and Activation theory. These theories are discussed in relation to employee engagement, supervisor Dark Triad traits, ICT adoption and organizational outcomes. First, this part examines the literature on Resource Based Theory of a company followed by Affective Event Theory and finally the Activation Theory. This section closes with a summary table displaying the chosen theory for the current study as well as the sources of some empirical investigations that use these theories to explain the employee engagement phenomenon.

2.6.1 Job Demand-Resources (JD-R) Theory

The crux of this study is based on the Job Demand-Resource (JD-R) model, which was developed by Demerouti, Bakker, Nachreiner, and Schaufeli (2001). This model originated from the Job Demand-Control model proposed by Karasek (1979). According to this theoretical framework, it is posited that job attributes characterised by elevated job expectations and diminished job control have the potential to engender adverse health consequences and disorders associated with stress. The JD-R theory extends the existing paradigm by integrating supplementary job resources that have the potential to mitigate the effects of job demands. The theoretical framework known as Job Demands-Resources (JD-R) theory offers insight into the ways in which work-related demands and resources might influence the well-being and performance of employees (Demerouti et al., 2001; Bakker & Demerouti, 2007). According to Demerouti et al. (2001:499), the theory posits that job stress and burnout in various workplaces may be classified into two main categories: job demands and job resources. Hence, irrespective of specific requirements and accessible resources, the JD-R model may be applied in many occupational contexts (Bakker and Demerouti 2018:170).

Job demands refer to the various mental, social, physical, and organisational elements of a job that necessitate continuous physical and/or mental exertion or expertise, consequently leading to specific physiological and/or psychological expenses (Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2007:768; Bakker & Demerouti,

2014). Job demands can be classified into various categories, including physical demands, emotional demands, cognitive demands, social demands, and organisational demands (Bakker & Demerouti, 2014:2). Job demands can have both negative and positive effects on employees' well-being and performance. On the negative side, high levels of job demands have the potential to result in burnout, exhaustion, stress, and turnover intentions. On the positive side, moderate levels of job demands may stimulate employees' motivation, creativity, and learning and enhance their work engagement and job satisfaction (Bakker & Demerouti, 2014). Several studies have classified job demands in proximal and distal locations (Elidemir, Ozturen, and Bayighomog 2020; Pak, Kooij, de Lange, and Van Veldhoven 2019; Miao and Cao 2019). These researchers claim that the term "proximate context" refers to job requirements that are present in the current work environment and directly affect employees' productivity. According to Van Veldhoven and Peccei (2015:4), the proximal context includes all elements that are directly or indirectly related to the work activities. Physical (such as equipment or tools), social (such as coworkers or clients), or intangible (such as orders or scripts) needs are a few examples of proximal workplace demands. Distal job needs, on the other hand, describe duties carried out within a bigger professional setting. The distal context, according to Pak et al. 2019:339 and Elidemir, Ozturen, and Bayighomog 2020:12, is the organisational and social settings in which the task is carried out. Distal job demands include things like working conditions, timetables, and resources like social assistance, organisational fairness, and job security.

Job resources encompass several dimensions of work, including the physical, emotional, social, and organisational components, which aid individuals in attaining their work-related objectives, mitigating job-related pressures, and fostering overall well-being (Bakker & Demerouti, 2007:3121). According to Bakker and Demerouti (2018:274), resources in the context of work can encompass several factors such as independence, social assistance, feedback on performance, possibilities for development, and a supportive work environment. Xanthopoulos et al. (2007) and Demerouti (2018) have posited that the expanded dimension of the JD-R model include the consideration of worker resources. Personal resources refer to individuals' perceptions of the extent to which they possess power and influence over their immediate environment (Bakker and Demerouti 2018:275; Hobfoll et al. 2003). According to Granziera et al. (2021:231), individual attributes such as flexibility, self-

efficacy, and cognitive and behavioural coping strategies may have a role in influencing the influence of job demands and job resources on employee outcomes. As a result, people with enough personal resources feel that positive things will come to them and that they will be able to handle unexpected occurrences (Bakker and Demerouti 2018:275).

Job demand is believed to have a detrimental impact on employee outcomes (Granziera et al., 2021; Bakker and Demerouti, 2018; Bakker, Demerouti, de Boer, and Schaufeli, 2003:341). As a result, the demands of employment have the potential to exhaust or hinder the physical and mental abilities of individuals, leading to unfavourable results for employees (Bakker and Demerouti 2018:278; Schaufeli and Taris 2014:44). Job resources are intended to encourage employees and to buffer or decrease the negative impact on job demands (Granziera et al., 2021:231; Bakker and Demerouti, 2018:278). According to Halbesleben and Buckley (2004), providing employees with social support can lessen the negative consequences of workplace demands and boost job satisfaction. Similarly, learning and development opportunities have been shown to boost job satisfaction and motivation (Van van Heijden, Schalk, & Van Veldhoven, 2008). When employees experience high job demands, job resources can help them stay motivated. In other words, job demands push workers to use all of their job resources to get results that are good for them and for the company (Miao and Cao 2019:6).

In this study, the application of JD-R theory enables an examination of the interconnections among worker engagement, ICT adoption, supervisor dark triad traits, and organisational outcomes, specifically task and citizenship performance. Engagement among staff members can be conceptualised as a valuable job resource, as previous research has demonstrated its positive associations with job satisfaction, performance, and employee retention (Bakker & Bal, 2010). Engaged workers are more likely to feel energised, focused, and committed to their work and are therefore more likely to perform well on their tasks and display good citizenship behaviours. For example, studies have indicated that employment resources that include social assistance, autonomy, and feedback are favourably related to both task performance and citizenship practises such as helping others, sharing knowledge, and going beyond the formal job requirements (e.g., Bakker & Demerouti, 2007; Halbesleben & Buckley, 2004).

In relation to ICT adoption, JD-R theory suggests that employment resources like ICT training and support can contribute to the development of employee skills and abilities, leading to increased engagement in the use of ICTs. In this era, we are witnessing how a pandemic has changed the way we use technology in education. Technical university employees who are able to learn and inculcate ICT skills and abilities in their operations can lead their universities to superior organisational outcomes for the benefit of students, co-workers, and the university at large. In this way, increased ICT adoption by employees at a particular technical university might potentially serve as a means to gain a competitive edge. Conversely, job demands such as the need to constantly learn and adapt to new technologies can negatively impact employee engagement if not adequately supported. Therefore, technical university employees who are unable to harness the benefits of ICT in their operations in this COVID-19 era risk losing the competition contest to rival universities, which could have an adverse effect on organisational outcomes at the expense of students, co-workers, and the university as a whole. For example, Tarhini et al. (2017:319) discovered that the presence of organisational assistance and staff training, which are considered job resources, had a favourable influence on the connection between worker engagement and technology adoption in small to medium-sized companies located in Lebanon.

The presence of a supervisor with dark triad traits, however, can be seen as a job demand that has the potential to result in adverse consequences, such as increased levels of stress and job strain (Jonason et al., 2012). The presence of dark triad qualities in supervisors, namely narcissism, Machiavellianism, and psychopathy, may impede the beneficial impact of work resources on engaged employee. For example, a supervisor high in Machiavellianism may use manipulative tactics to control their subordinates, leading to decreased levels of employee engagement. Again, a supervisor high in narcissism may prioritise their own interests over the needs of their subordinates, leading to decreased access to job resources such as training opportunities or career advancement. This may ultimately decrease employee engagement and negatively impact organisational outcomes. On the other hand, a supervisor high in empathy may create a positive work environment by providing emotional support and recognition, which can enhance employee engagement.

The JD-R theory proposes that job resources have the potential to mitigate the adverse effects of job demands on employee outcomes can buffer the negative impact of job demands on worker outcomes. Within the scope of this study, it is posited that employee involvement and the use of information and communication technology (ICT) can serve as valuable assets in mitigating the adverse effects of supervisor dark triad traits on both task performance and citizenship behaviour. The presence of job resources such as employee engagement and ICT adoption may mitigate the negative impact of such supervisors on task and citizenship performance. By using this theory as a basis, researchers can design studies that explore the complex relationships between these variables and provide insights into how organisations can improve employee outcomes. The JD-R model effectively encompasses all the variables employed in this study and elucidates the interrelationships among them. The next section reviews the affective events theory and explains how the theory relates to this study.

2.6.2 Affective Events Theory

The Affective Events Theory, as proposed by Weiss and Cropanzano (1996:50), concentrates on the framework, reasons, and outcomes of emotional experiences of work-related events. Emotional encounters within the workplace context. These situations regularly occur in the workplace, and individuals frequently respond emotionally to them. The emotional experiences associated with events exert immediate influence on individuals' behaviours and attitudes. The Affective Events Theory considers the structure of affective reactions as important as the structure of environments. According to AET, there is a connection between employees' internal factors (such emotions) and their reactions to events that happen at work, which affects their performance, devotion to their jobs, and long-term job happiness. According to the notion, incidents that occur throughout the workday, both positive and negative, can affect employees' feelings and may have an impact on the overall atmosphere of the organization and overall performance (Weiss & Cropanzano, 1996). The theory acknowledges the multifaceted nature of emotion and underscores the significance of the framework of psychological encounter. People feel angry, frustrated, proud or joyful and these different reactions have different behavioural implications.

According to Weiss and Cropanzano (1996:50), the Affective Events Theory posits that occurrences within the work environment frequently elicit emotional responses from employees. Employees' attitudes and conduct are impacted by these emotive experiences. In this regard, it is worth noting that positive events occurring within the workplace have the potential to stimulate cognitive assessments pertaining to one's job. Consequently, the experience of positive events is likely to foster a more favourable perception of the job, thereby enhancing employees' motivation to exert greater effort in their work (Thoresen et al., 2003). Conversely, the occurrence of an adverse incident inside the workplace elicits cognitive assessments pertaining to one's employment, whereby the encounter of unfavourable occurrences engenders a more pessimistic perception of the job and therefore diminishes employees' motivation to exert effort in their work (Thoresen et al., 2003:923).

This study primarily employs the Affective Events Theory (Weiss & Cropanzano, 1996:50) to elucidate the direct adverse effect of supervisor dark triad on employee engagement. The theory regards high supervisor/leader dark triad (high Machiavellianism, psychopathy, narcissism) as negative emotional events experienced by employees at the workplace due to leaders/supervisors' negative dispositions. These negative dispositions of leaders are believed to hinder employees' work engagement, leading to a state of mind characterised by feelings of weariness, abandonment, apathy, unconcern and indifference. On the contrary, the theory considers low supervisor/leader dark triad (low Machiavellianism, psychopathy, narcissism) as positive emotional events towards employees at the workplace due to leaders/supervisors' positive dispositions, which in effect, encourages or inspires those employees to improve organisational outcomes for the benefit of the Technical University.

Secondly, the Affective Events Theory (Weiss & Cropanzano, 1996:50) is employed to explain the direct negative effect of supervisor dark triad on organisational outcomes. The theory regards high supervisor/leader dark triad (high Machiavellianism, psychopathy, narcissism) as negative emotional events experienced by employees at the workplace due to leaders/supervisors' negative dispositions, which, in turn, cause those employees to produce negative organisational outcomes at the expense of the Technical University. On the contrary, the theory considers low supervisor/leader dark triad (low Machiavellianism, psychopathy, narcissism) as positive emotional events

towards employees at the workplace due to leaders/supervisors' positive dispositions, which, in effect, encourage or inspire those employees to improve organisational outcomes for the benefit of the Technical University. The Affective Events Theory (Weiss & Cropanzano, 1996:50) is applied to clarify the intermediary function of ICT adoption in the immediate connection between employee engagement and organisational results, specifically observed in task and citizenship performance.

The affective events theory posits that employees who exhibit a high level of engagement in their job are more inclined to display positive emotional events, such as joy, curiosity, and excitement. These emotional experiences subsequently influence their inclination to embrace novel techniques or technology (i.e. ICT adoption) to foster organisational outcomes (task and citizenship performance) for the benefit of his/her Technical University. On the contrary, a low level of employee engagement may stifle ICT embracement and utilisation in the Technical Universities of Ghana, which could eventually decrease organisational outcomes (task and citizenship performance) at the expense of student, co-workers and the Technical University at large.

The application of AET in assessing workplace events, employee emotions, job attitudes, and behavior reactions is supported by a number of research (Stam and Stanton, 2010, p. 27). These include Weiss et al. (1999), who looked at the collective effects of emotional encounters and how people see their jobs affect job happiness, while also examining the dynamics of emotions over a certain period; Fisher (2002), who investigated the causes and effects of immediate emotional responses within the work context; Fuller et al. (2003), who examined the relationships between daily stressful events, mood, and investigated processes by which job stress and satisfaction unfold over time; and Wegge et al. (2006) investigated the assumptions of AET in call center work.

Critics of AET argue that the theory lacks clarity in its definitions and conceptualizations of key constructs, and that its narrow focus neglects other significant aspects that might potentially impact individuals' emotions and behavior at the place of work (Weiss and Cropanzano, 1996; George and Jones, 2000). However, while these criticisms exist, Affective Events Theory has also made notable advancement to the domain of organizational behavior and provided valuable insights into the role of affect in the workplace. Therefore, AET is an important theory to anchor supervisor

dark triad on organisational outcomes, as well as the potential mediating effect of Information and Communication Technology (ICT). The next section reviews the activation theory and explains how the activation theory relates to this study.

2.6.3 Activation theory (Gardner; Gardner & Cummings, 1988)

The Activation Theory (Gardner, 1986:413; Gardner & Cummings, 1988:90) proposes that people need a certain level of activation to be sufficiently motivated to achieve goals and perform task effectively. The activation level is regarded as a monotonic function whether the degree of stimulation affects a person at any time. People need a certain amount of activation to be motivated. Too much activation will lower positive responses and performance, particularly for complex and difficult tasks (Gardner, 1990:221). Employees will respond more positively and perform better at a moderate activation level. At a moderate level, employees will perform their tasks appropriately, making full use of cognitive resources, which will lead to positive outcomes (Baer & Oldham, 2006:968; Gardner, 1990:221).

In contrast, with too little or too much activation, employees will lack engagement or have cognitive interference, preventing them from accomplishing cognitively demanding work (Byron, Khazanchi & Nazarian, and 2010:209). As it is important for employees to engage cognitively, emotionally and behaviourally in their work (Drazin, Glynn & Kazanjian, 1999:304), a moderate activation level could be positively related to higher performance. Gardner (1986:413; 1990:221) maintains that the activation level has an inverted curvilinear relation to performance. This view suggests that performance declines when activation is beyond the optimal level, turning the activation into stressors. However, stressors can increase positive response and high performance when it is kept at an optimal level.

In this research, the activation theory (Gardner, 1986:413; Gardner & Cummings, 1988:90) is employed to comprehend the role of supervisor dark triad traits in moderating the relationship between employee engagement and organisational outcomes (task and citizenship performance). The activation theory postulates that the level of stress exerted by a supervisor or leader on an employee influences the connection between worker engagement and organisational consequences.

To explain, the activation theory hypothesizes that a desired or optimal level of stress experienced by an engaged employee from his/her supervisor/leader's actions could inspire him/her to perform tasks and demonstrate citizenship behaviour for the benefit of his/her Technical University. On the other hand, too much stress, in the form of supervisor dark triad, could damage an engaged employee's ability to perform a task and show citizenship behaviour, thereby reducing organizational outcomes. Therefore, creating an enabling atmosphere characterized by an optimal level of stress by supervisors/leaders at the workplace is key to successful employee engagement, creating unbreakable string relationship between supervisors/leaders and employees (Eiampradispon & Eaknarajindawat, 2021).

While Activation Theory has been influential in understanding the impact of activation levels on behavior and performance, it is not without limitations. Critics argue that Activation Theory provides a simplistic view of behavior and performance, lacks clear explanatory mechanisms and does not adequately address individual differences (Eccles & Wigfield, 2002). These shortcomings do not justify rejecting activation theory. Rather, they reflect the theory's limitations and other characteristics that require empirical elucidation (Gardner & Cummings, 1988). The next section concludes with a summary of the chapter.

2.7 Conclusion

This chapter considered the conceptual and theoretical reviews of this study. The conceptual review covered detailed review on employee engagement, organisational outcomes (task and citizenship performance), supervisor dark triad and ICT adoption. The theoretical review discussed three relevant theories that underpinned this thesis, namely the Job Demand-Resource Theory, Affective Events Theory and Activation Theory. The use of the Job Demand-Resource Theory provided a platform for clarifying numerous dynamics within the research. It was useful in elucidating the direct positive association between employee engagement and organisational results, as well as the relationships between ICT adoption and organisational outcomes that included task and citizenship performance. Furthermore, the idea contributed to a better understanding of the link between employee engagement and ICT adoption. The JD-R hypothesis was particularly useful in determining the negative direct association between supervisor

dark triad qualities and organisational results. Furthermore, it had the ability to provide insight on the role of ICT adoption as an intermediate function and the moderating impact of supervisor dark triad qualities in the link between employee engagement and organisational results.

The Affective Events Theory was utilised to clarify the direct negative influence of supervisor dark triad on worker engagement. The Affective Events Theory was also useful in understanding the negative effect of supervisor dark triad on organisational outcomes. Again, the Affective Events Theory was employed to elucidate the function of ICT adoption as a mediator in the direct link between employee engagement and organisational results, as evidenced in task and citizenship performance. Finally, the Activation Theory was used to analyse the role of the supervisor dark triad as a moderator in the direct link between employee engagement and organisational outcomes (task and citizenship performance).

Table 2.2: Summary of the Theories

Theory	Proponent	Focus	Contribution
Job-Demand Resource	Demerouti, Bakker, Nachreiner, & Schaufeli, (2001)	It emphasises the significance of comprehending the interplay between demands and resources and their impact on employees' experiences and outcomes in the workplace.	The theory helps to explore how job demands and resources, such as supervisor behavior and technology adoption, interact with employee engagement to shape outcomes in the workplace
Affective Event	Weiss & Cropanzano, (1996)	Impact of specific events and experiences on employees' emotions, attitudes, and behaviors at work and	The theory contributes to a better understanding of the direct link

		suggests that events occurring in the workplace can trigger emotional reactions	between SDT and organisational results, as well as the function of ICT adoption in mediating the relationship between EE and organisational outcomes.
Activation	Gardner,1986 Gardner & Cummings, 1988	Focus on relationship between physiological arousal and performance and suggests that different levels of arousal can influence cognitive processing and task performance.	Contributes to a deeper understanding of how SDT moderates the association between EE and organisational outcomes.

The subsequent chapter provides an empirical evaluation and formulates hypotheses in accordance with the study's aims.

CHAPTER THREE

EMPIRICAL REVIEW AND HYPOTHESES DEVELOPMENT

3.1 Introduction

This research seeks to investigate the role of supervisor Dark Triad and ICT adoption on employee engagement and organisational outcomes in Technical Universities of Ghana. This chapter examines the empirical review and conceptual framework of this study. The empirical review chronicles and evaluates the methods and outcomes of connected investigations. The conceptual framework depicts how this study is investigated in accordance with the research objectives and underlying hypotheses. This chapter concludes with a summary of the chapter.

3.2 Empirical Review and Hypotheses Development

Extracts of empirical review of the study and applicable theories were used to generate the hypothesis. This part presents a review of the evidence of the study in accordance with the research objectives. The empirical analysis commences by evaluating the direct influence of worker engagement on organisational outcomes, and subsequently explores the correlation between employee engagement and the use of information and communication technology (ICT). Following this, the author conducts a literature assessment on the influence of ICT adoption and supervisor dark triad on organisational outcomes. The next section provides an overview of the existing evidence pertaining to the moderating influence of supervisors with dark triad traits on the association between worker engagement and organisational outcomes. The review concludes by examining the potential mediating role of ICT adoption in the relationship between employee engagement and organisational outcomes.

3.2.1 Employee Engagement and Organisational Outcomes (task and citizenship performance)

A growing amount of research demonstrates a positive relationship between employee engagement and a variety of organisational outcomes, including but not limited to task performance and citizenship performance. Previous research has shown that employee engagement improves individual performance (Rich, LePine, and Crawford, 2010; Christian et al., 2011), collective performance (May et al., 2004), and even predicts

organisational financial performance (Schaufeli and Bakker, 2008). In a study conducted by Ariani (2013), the author investigated the correlation between employee engagement, organisational citizenship behaviour (OCB), and counterproductive work behaviour (CWB) among a sample of 507 service sector employees in Yogyakarta, Indonesia. The outcome demonstrated a considerable positive relationship between employee engagement and OCB. Using a survey of 283 workers at a UK-based consultancy and construction firm, Shantz, Alfes, Truss, and Soane (2013) found that workers whose jobs provided greater opportunities for autonomy, task variety, and task significance also demonstrated greater organisational citizenship behaviours and received higher performance ratings from their supervisors. In a separate research work, Agarwal, Datta, Blake-Beard, and Bhargava (2012:208) conducted a study with a sample of 979 management personnel employed in six service sector businesses in India. Their findings revealed a positive correlation between work engagement and creative work behaviour, while indicating a negative correlation between work engagement and desire to resign.

In a different study, Moletsane, Tefera, and Migiro (2019:128) found a significant correlation between employee engagement and productivity. Using self-reported measurements and online surveys, Basit (2019:653) sampled 185 employees from one of the world's largest hosiery firms in eastern Punjab, Pakistan. Respectful engagement (RE) was found to substantially enhance task performance and emotional commitment. However, RE had a greater impact on affective commitment than on task performance. Again, Pattnaik and Sahoo (2021) utilised a quantitative research approach with a sample of 396 employees and their clients in India and discovered a positive correlation between employee engagement and task performance. Furthermore, Bhardwaj and Kalia (2021) found that the vigour, dedication, and absorption factors of employee engagement contribute to contextual performance in a study done in four regions of Himachal Pradesh utilising a multistage sampling approach and a sample of 360 hotel workers. Employees' task performance is influenced by their vigour and focus. Van Zyl, Van Oort, Rispens, and Olckers (2021:4019) used a cross-sectional survey to collect data from 232 ICT employees in the Netherlands. Employee task performance was found to be favourably influenced by workers' levels of engagement in their jobs. Employee engagement, as conceptualised within the JD-R theory, is regarded as a motivating phenomenon that transpires when the available job resources surpass the job

demands. Engaged employees are those that exhibit a pleasant and gratifying mental state, marked by elevated levels of energy, commitment, and immersion in their professional tasks. This involvement results in favourable consequences for individuals and enterprises. In light of the aforementioned data and in alignment with the JD-R theory, it is hypothesised that :

H1_a: *Employee engagement positively and significantly influence organizational outcomes*

H1_b: *Employee engagement positively and significantly influence task performance*

H1_c: *Employee engagement positively and significantly influence citizenship performance*

3.3 Employee Engagement and ICT Adoption

This study examines the potential impact of employee engagement on the adoption and utilisation of information and communication technology (ICT) tools and systems in organisational settings. According to Patnaik and Sahoo (2021) engaged employees are devoted, enthusiastic (Burnett, and Lisk 2019; Macey et al 2009) and are expected to utilise novel approaches to accomplishing their duties. Similarly, when employees are highly engaged, they are more likely to embrace change and be receptive to new technologies (Burnett, and Lisk 2019). When people are actively involved and fully immersed in their work, their level of motivation increases. According to Eldor and Harpaz (2016), this phenomenon leads to employees exhibiting a broader spectrum of ideas and an increased level of creativity. According to Burnett and Lisk (2019), employees who are engaged in their work tend to have favourable attitudes, high levels of motivation, and a proactive inclination towards learning and adapting. This has the potential to establish a conducive atmosphere for Information and Communication Technology (ICT). This can create a favorable environment for ICT adoption within an organization. They are more likely to actively seek opportunities to leverage technology for their work processes, collaborate with colleagues, and enhance their productivity.

To date, there has been a scarcity of exact empirical studies examining the relationship between employee engagement and ICT adoption. In contrast, a closely related

empirical study by Patnaik and Sahoo (2021) investigated employee engagement, inventiveness, and job performance. This study, done within an Indian organisation and including 396 workers and their clients, discovered a favourable association between employee engagement and employee creativity. Despite these efforts, the link between employee engagement and ICT adoption remains relatively unexplored. This suggests that engagement encourages individuals' to be internally motivated to generate new ideas.

Besides, empirical research has found a link between ICT adoption and the level of employee engagement in organisations. For example, a research investigation by Benitez, Ruiz, and Popovic, (2022) which was tested with a survey dataset from 134 firms discovered that mobile technology-enabled HR gamification initiative improves job satisfaction and employee engagement. Similarly, Okolo (2018) found that there exists a positive correlation between technostress and employee engagement using a purposive sampling method with a total of 319 participants from the front desks of Nigerian commercial banks, contrary to the negative relationship proposed. Various studies have indicated contrasting findings about the impact of telecommuting on employee engagement. Sardeshmukh et al. (2012:202) have reported negative effects, whereas Demerouti et al. (2014) have found favourable effects. Conversely, de Vries et al. (2019) have seen no significant influence on employee engagement.

Applying the JD-R theory, it can be identified that the introduction of new technologies and ICT adoption may pose initial job demands on employees, such as learning new systems or adjusting to changes in work processes. However, if employees have access to adequate job resources (ICT adoption), such as training programs, technical support, and a supportive work environment, they can overcome these demands more effectively. These resources provide employees with the necessary support and confidence to embrace technology and utilize it effectively in their work, leading to increased engagement. Employees that are engaged in their job are more inclined to adopt and use ICT tools and systems. Drawing from the above, it is hypothesized that

H2: Employee engagement positively and significantly promotes ICT adoption in organisations.

3.4 Information Communication Technology Adoption and Organisational

Outcomes

The adoption of ICT during crises is essential for organisational outcomes. Adoption of ICT is mainly reliant on technological acceptability. Davis (1989) claims in his model (TAM) that perceptions of relevance, ease of use, and attitude toward use impact adoption and use of information systems in enterprises (Lu, Yu, Liu, and Yao, 2003:209). Venkatesh et al. (2003) framework (UTAUT) also emphasises that facilitating conditions and social influence, among other things, determine acceptance.

According to the study conducted by Rusdi, Hassan, Munir, and Mohamad (2017:7841), a total of 200 respondents from five small and medium-sized enterprises (SMEs) in the manufacturing sector of Malaysia were surveyed. The findings of the study revealed that there exists a significant and favourable association between management support and ICT training with employee performance. However, the study also found that technology utilisation had an insignificant relationship with employee performance. This finding suggested that management support for ICT adoption and ICT training offered to employees enhanced their performance. In Jordan public sector Nawafleh (2018:433) utilised a questionnaire, which was targeted to a sample of 337 randomly selected personnel, and found that factors of e-management were positively and significantly related to employee job performance across the public sector in Jordan. This result implied that the adoption of e-management practices enabled employees to increase their job performance. Similarly, Barba-Sanchez, Calderón-Milán and Atienza-Sahuquillo (2018:1401) analysed the impact of the intensity of a firm's adoption of ICT on corporate performance. A sample of 871 SMEs in Spain took part in the study and data were analysed using ordered logistic regression and principal axis factoring analysis. The investigators found a positive and significant relationship between ICT intensity of use and corporate performance. This result highlighted the importance of ICT in very competitive environments.

Yunis, Tarhini and Kassar (2018:354) examined the relationship between ICT use and organisational performance in the Lebanese market. The researchers targeted employees, department heads, and managers who adopted ICT applications in SMEs located in Lebanon. The convenience sampling technique was employed. Yunis et al. (2018) discovered a statistically significant and favourable correlation between the use

of information and communication technology (ICT) and the overall performance of organisations. This result implied that ICT use was a strategic resource that enabled the SMEs gain sustainable competitive advantage, and this sustainable competitive advantage enabled the SMEs to increase organisational performance. Using regression analysis based on a production function framework and exploited fine-grained firm survey data on ICT use and favourable organisational practices for 1,045 service firms in Germany, Viete and Erdsiek (2020:14) found empirical support for the argument that the adoption of mobile ICT positively and significantly enhanced favourable organisational practices. This finding suggested that the adoption and utilisation of mobile ICT in the workplace improved on favourable organisational practices.

The available research suggests that there is evidence supporting a possible positive influence of ICT adoption on employee task and citizenship performance. Consequently, in line with the JD-R theory, the availability and effective utilization of ICT tools and platforms are considered job resources that improve efficiency, foster innovation and collaboration, supports knowledge sharing and enhance employee satisfaction and engagement. Therefore, technical university staff that learn and use ICT can lead their universities to superior organisational outcomes for students, coworkers, and the university. Technical university staff who cannot use ICT in this COVID-19 era risk losing the race to competing institutions, which might harm students, co-workers, and the university as a whole. It is thus hypothesized that:

H3_a: ICT adoption positively and significantly influence organizational outcomes

H3_b: ICT adoption positively and significantly influence task performance

H3_c: ICT adoption positively and significantly influence citizenship performance

3.5 Supervisor /Leader Dark Triad and Organisational Outcomes

Research has shown that supervisors high in Dark Triad traits can have detrimental effects on employee well-being, job satisfaction, and organizational performance (Volmer, Koch and Göritz, (2016). However, the influence of Dark Triad traits on the organizational outcomes remains relatively unexplored, particularly in the context of technical universities in Ghana. The section considers reviews on literature closely related to the relationship. Myung, Choi, and Kim (2017:18) studied CEOs' negative attributes and CSR in Korea. The researchers surveyed 165 individuals in 12 industries

and found that negative CEO traits had an adverse and substantial influence on employee perceptions of ethics, social responsibility, and CSR activity. This study suggested that a CEO's bad qualities affected staff ethics and CSR involvement. Again, a study by Shu and Lazatkhan (2017:78) that employed paired questionnaires from 245 subordinates and 82 supervisors at 38 firms in central, western, and eastern Mongolia revealed that the quality of leader-member dialogue was adversely and significantly linked to employee envy but favourably linked to job engagement. When leader-member exchange quality was bad, employee envy increased while job engagement decreased.

In another study, Pan, Sun, Sun, Li and Leung (2018:2267) collected data from 198 employees and 34 supervisors at four hotel companies in Macau, China, at three time periods. The researchers discovered a negative direct effect of abusive supervision on job-oriented constructive deviance, implying that the sustained display of hostile verbal and non-verbal behaviours of supervisors stifled the job-oriented constructive deviant behaviours of employees. Zhao and Guo (2019:1992) used a two-phase strategy to obtain data from 353 employees of 10 Chinese hotels. After conducting hierarchical multiple regression analysis, the authors found that abusive supervision negatively affected hotel workers' helping behaviour. This research revealed that supervisors' hostile verbal and nonverbal behaviour hindered voluntary employee behaviour. These findings resembled the study by Pan et al. (2018).

In a related study, data from 60 front-line employees at a midsize Taiwan high-tech manufacturing company revealed a significant but unfavourable correlation between abusive supervision and employee citizenship behaviour, such that supervisors' hostile verbal and nonverbal behaviour hindered employee citizenship (Huang, Su, Lin, and Lu (2019:525). Additionally, Moin, Wei and Weng (2020:506) investigated abusive supervision and performance using a lagged and dyadic sample of 210 subordinates and 30 supervisors. The investigators found a negative and significant effect of abusive supervision on job performance. The investigators therefore concluded that abusive supervisors were the cause of low employee performance in firms. Rice, Taylor and Forrester (2020:615) examined the relationship between abusive supervision and citizenship behaviour of employees. The researchers revealed that, over three studies, abusive supervision had a negative and significant relationship with citizenship behaviours. This result suggested that abusive supervisors turned the employees into

poor organisational citizens. Similarly, data from Pakistan 353 self-administered surveys and analysed using SEM found a link between aggressive supervision and unproductive job behaviour (Younus, Danish, and Rathore 2020). This study revealed that bosses' unpleasant verbal and nonverbal behaviour prompted employees to act counter productively.

Drawing from the Affective Events Theory that contends that personality traits could also form individuals' regular responses to life events, the theory regards high supervisor/leader dark triad (high Machiavellianism, psychopathy, and narcissism) as negative emotional events experienced by employees at work due to leaders/supervisors' negative dispositions, which stifles their level of work engagement, manifested in feelings of weariness, abandonment, apathy, unconcern and indifference. In contrast, the theory considers low supervisor/leader dark triad (low Machiavellianism, psychopathy, and narcissism) as positive emotional events towards employees at the workplace due to leaders/supervisors' positive dispositions, which encourages or inspires those employees to improve organisational outcomes. The JD-R theory also suggests that supervisor dark triad traits create additional job demands and deplete job resources for employees. These factors contribute to decreased employee well-being, job satisfaction, and engagement, which in turn may have negative implications for organizational outcomes, including decreased productivity, increased turnover, and reduced overall performance. It is therefore hypothesised that:

H4a: Supervisor dark triad trait negatively and substantially influence Organisational outcomes (task performance)

H4b: Supervisor dark triad trait negatively and substantially influence Organisational outcomes (citizenship performance)

3.5.1 Supervisor Machiavellianism on Task and Citizenship Performance

Volmer, Koch and Göritz, (2016:417) study among 811 public and private sector employees in Germany, using multiple regression analysis, discovered that Machiavellianism leadership had a negative and significant effect on subordinates' career satisfaction, emotional wellness, and job satisfaction. Using data collected through a survey conducted on 165 employees (companies) in twelve industries in Korea, Myung, Choi and Kim (2017:18) uncovered a negative and significant

relationship between the CEO's Machiavellianism and an employee's perception of ethics and social responsibility, and corporate social responsibility activities. This result implied that the Machiavellianism traits of the CEO weakened employee's perception of ethics and social responsibility, and corporate social responsibility activities. Younus et al. (2020:86) collected data from 353 respondents using self-administered questionnaires and analysed through structural equations modelling. The investigators found no statistically significant relationship between supervisor Machiavellianism *and* counterproductive work behaviours. This result seem contrary to the result of earlier studies, namely Volmer et al. (2016:417) in Germany, and Myung et al. (2017:18) in Korea. Using a vignette-based lab study, comprising 303 participants from the United States, and a daily diary field study of 476 daily responses from 69 participants recruited from China, Li, Kong, Lin and Fan (2021:34) found that leader Machiavellianism positively and significantly influenced follower state inauthenticity and follower work withdrawal. This result implied that the negative traits of Machiavellianism leader heightened follower state inauthenticity and follower work withdrawal. In Pakistan public sector Kayani and Alasan (2021:19) collected data from 355 nurses and using questionnaire as a research tool, the researchers identified a remarkable and statistically significant association between toxic leadership and counterproductive work behaviour.

Judging from the above findings, and consistent with the Affective Events and JD-R theories, the study hypothesised that:

H4c: Supervisor/Leaders Machiavellianism negatively and significantly influence task performance

H4d: Supervisor/Leaders Machiavellianism negatively and significantly influence citizenship performance

3.5.2 Supervisor/Leader Narcissism on Task and Citizenship Performance

Braun, Aydin, Frey and Peus (2018:739) conducted one pilot study, two experimental studies, and two field surveys in a German University and found that leader narcissism was positively and significantly related to followers' malicious envy and supervisor-targeted counterproductive work behaviour. This result implied that leader narcissism had detrimental impact on organisational functioning. Using data collected from a matching questionnaire survey of 48 leaders and 183 employees of two companies in

Wuhan, Hubei Province, and adopted hierarchical regression method and plug-in Process to test the model, Li, Ye and Zhang (2018:92) found that perceived leader narcissism had a detrimental influence on workers' willingness to engage in organisational citizenship activities towards their supervisors. This finding suggested that leader narcissism caused employees to show bad citizenship behaviour towards their supervisors. Similarly, Huang, Krasikova and Harms (2020:89) found a negative and significant relationship between leader narcissism and employee voice in a study of 457 employees and their 95 supervisors working at a large Chinese consulting company. Additionally, Beatrice (2020:38) found in a study of 238 adults that work at least 20 hours a week from a large public southeastern United States University that transformational leadership had a positive and significant effects on employee engagement. The author concluded that the actions and behaviour of transformation leaders improve employee engagement at the workplace.

In the light of the above discussion, it can be theorised that supervisor/leader narcissism would have a negative relationship with task and citizenship performance of employees. Hence, based on the findings of earlier studies and consistent with the Affective Event and JD-R theories, the writer of this thesis hypothesized as follows:

H4e: Supervisor/Leaders narcissism negatively and significantly influence task performance

H4f: Supervisor/Leaders narcissism negatively and significantly influence Citizenship performance

3.5.3 Supervisor/Leader Psychopathy on Organisational Outcomes (task and citizenship performance)

In a quantitative sample of 346 white collar workers, managers and professionals in Australia, Boddy and Taplin (2016:38) found that there was a direct negative link between corporate psychopaths and job satisfaction. Similarly, Myung et al. (2017:18) found a negative and significant effect of CEO's psychopathy on employee's perception of ethics and social responsibility, and employee's corporate social responsibility activities. Using a data from 104 workers across department/units within a university setting in Southwest Nigeria, Oyewunmi, Akinnusi and Oyewunmi (2018:153) found that corporate psychopathy correlated positively and significantly with emotional exhaustion, depersonalization and decreased personal accomplishment. In Turkey's

nine university hospitals, Erkutlu and Chafra (2019:210) collected data from 611 certified nurses and tested the data by using hierarchical multiple regression analysis. The investigators found a positive and significant effect of leader psychopathy on organisational deviance. Mulders (2020:2) found no significant effect of CEO psychopathy on firm innovation performance using panel data that covered a time from 2008 to 2016, and a sample consisting of firms in the United States of America. This result implied that CEO psychopathy did not influence firm innovation performance. Mulder's result was dissimilar to the findings of earlier studies, such as Myung et al. (2017:18) in Korea, Oyewunmi et al. (2018:153) in Nigeria, and Erkutlu and Chafra (2019:210) in Turkey. In China's tourism enterprises Khan, Khan, Moin and Pitafi (2020:20) using a sample of 298 employees and their respective supervisors, found a negative and significant effect of psychopathic leadership on career satisfaction. In another study, Boddy, Malovany, Kunter, and Gull (2020:26) conducted a research whereby they examined 21 in-depth interviews conducted in both the United Kingdom and the United States of America. These interviews were conducted with corporate workers who had direct experience working with a toxic boss characterised as a corporate psychopath. The well-being of research participants in both nations was found to be impacted by psychopathic leadership, leading to the manifestation of stress-related disorders, sadness, and even suicide ideation. Therefore, supported by the findings of previous studies and parallel to the assumptions of Affective Events Theory and JD-R theory, the writer hypothesises as follows:

H4g: Supervisor/Leaders psychopathy negatively and significantly influence organizational outcomes (task performance)

H4h: Supervisor/Leaders psychopathy negatively and significantly influence organizational outcomes (citizenship performance)

3.6 Moderating Effect of Supervisor/Leader Dark Triad Trait

This section evaluates literature closely related to the moderating role of supervisor/leader dark triad on the relationship between employee engagement and organisational outcomes. The author argues that supervisor DT will moderate the effect of employee engagement on organizational outcomes. Howladar, Rahman and Uddin (2018:173) collected data using a self-administered questionnaire from 288 respondents in Bangladesh using quota sampling approach. The result suggested that

transformational leadership style reduced the negative effect of deviant behaviour on job performance. In another study based on the multiphase and multilevel data from 120 sales team supervisors and 426 insurance salespeople in China, Cheng, Wei and Lin (2019:40) found that leader-employee value congruence moderated the relationship between leader responsible leadership and unethical pro-organisational behaviour.

In a survey study on 191 firms, Bouncken, Cesinger and Tiberius (2020:299) found that manager dark triad moderated the positive effect of employee's entrepreneurial orientation on firm performance. This finding suggested that manager dark triad suppressed the positive effect that employee's entrepreneurial orientation had on firm performance. Accordingly, top managers' selfish behaviour, emotional coldness, propensity for duplicity, and quest for self-promotion, status and dominance stifled innovativeness, reactivity, and risk-taking tendencies of the employees. Using an online survey data through the Qualtrics panel service in the USA, Chang, Busser and Liu (2020:2132) found that psychological contract fulfilment exerted a conditional effect on the linkage between authentic leadership and career satisfaction. This finding implied that authentic leadership improved career satisfaction of employees in a context where psychological contract is fulfilled. In contrast, psychological contract breach weakens the authentic leadership-career satisfaction relationship.

Beatrice (2020:38) study found that transformational leadership positively moderated the direct relationship between psychological capital and employee engagement. The author therefore concluded that the importance of psychological capital in its relationship with employee engagement depended on the level of transformational leadership present in the relationship. Using a data from 278 full-time hotel employees, Teng, Cheng and Chen (2021:115) findings suggested that high abusive supervision weakened the obsessive passion-job embeddedness relationship, as well as obsessive passion-work engagement relationship. On the other hand, a low abusive supervision strengthened the obsessive passion-job embeddedness relationship, as well as obsessive passion-work engagement relationship. According to Koomson (2021:17), there is evidence suggesting that psychological contract breach plays a significant role in influencing the relationship between job satisfaction and corporate citizenship behaviour among physicians in the Upper East and West Regions of Ghana. This conclusion is based on the analysis of data collected from a sample of 214 physicians

working across 26 health-care units. Koomson (2021:17) explained that the occurrence of a break in the psychological contract resulted in a decrease in morale among satisfied physicians, hence inhibiting their demonstration of organisational citizenship behaviour. On the other hand, the presence of a fulfilled psychological contract serves as a motivating factor for physicians, leading to increased manifestation of organisational citizenship behaviour.

Based on the findings of earlier studies and in line with both Activation theory and Job Demands-Resources (JD-R) theory further insights can be provided into explaining the moderating role of supervisor Dark Triad traits on the relationship between employee engagement and organizational outcomes. It is hypothesized that:

H₅: Supervisor dark triad will moderates the relationship between employee engagement and task performance such that this relationship is weakened at high SDT than at low levels of SDT.

H₅: Supervisor dark triad will moderates the relationship between employee engagement and citizenship performance such that this relationship is weakened at high SDT than at low levels of SDT.

3.7 Mediating Effect of ICT Adoption

This section reviews literature that are closely related to the indirect effect of ICT adoption on the direct relationship between employee engagement and organisational outcomes. The literature, however, suggested that earlier researchers have paid less attention to the mediating role of ICT adoption in the relationship between employee engagements on organisational outcomes. These existing studies have concentrated on other mediating variables, namely organisational politics, employee voice, job satisfaction, creativity, organisational job-embeddedness, and employees' experience. Eldor (2017:255) examined the mediating role of organisational politics in the direct relationship between employee engagement and performance at work. The author utilised data from 253 high-tech employees and their supervisors in Israel. They found that perceptions of organisational politics mediated the relationship between employee engagement and employee performance. This finding suggested that when engaged employees perceived their workplace to be political, they became more proactive,

creative, and adaptive and more likely to share their knowledge with their peers, consequently leading to improved employee performance.

Using responses from 301 Indian service sector employees, Jena, Bhattacharyya and Pradhan (2017:360) reported that employee voice partially mediated the association of employee engagement and affective organizational commitment. This result implied that engaged employees demonstrated certain behavioural manifestations like cooperation with authority and colleagues, and this led to the demonstration of constructive voice behaviour on the part of employees to foster organisational commitment. In a quantitative study using 429 information technology personnel in the banking sector of Jordan, Al-dalahmeh, Khalaf, and Obeidat (2018:40) found that job satisfaction partially mediated the association between employee engagement and organisational performance. This study suggested that employee engagement enhanced organisational performance by way of job satisfaction. In contrast, a disengaged employee is more likely to exhibit poor levels of work satisfaction, which can have a negative impact on the performance of the organisation. Ismail, Iqbal, and Nasr (2018:15) surveyed 186 Lebanese employees and found that the positive impact of employee engagement on work performance was totally mediated by creativity.

Kapil and Rastogi (2019:2012) explored the mediation influence of job-embeddedness on employee engagement and organisational citizenship behaviour. Using a sample of 430 Indian IT workers, confirmatory factor analysis and SEM they discovered that Job-embeddedness somewhat mediated the employee engagement–citizenship behaviour link. This implies that high employee engagement increased the employee's likelihood to stay in his/her employment and to display citizenship. Low employee engagement reduced the employee's likelihood to stay in his/her employment and to display citizenship. Ahad and Khan (2020:20) analysed the mediating effect of demographic attributes on the relationship between employee engagement and organisational citizenship behaviour. The analysers sought responses from 524 employees in local enterprises in Dhaka city of Bangladesh. Ahad and Khan (2020) discovered that there exists a partial mediation effect of workers' experience on the relationship between employee engagement and organisational citizenship conduct. The result suggest that a highly engaged employee is more likely to gain good working experience by

performing his/her duties and this experience can increase his/her chances of showing citizenship behaviour.

Gathering from the findings and in line with the propositions of the affective events theory and JD-R theory, this study anticipates that the adoption of information and communication technology (ICT) will serve as a mediator in the favourable connection between worker engagement and organisational outcomes, such that a highly engaged employee would be more likely to adopt new approaches or technologies (i.e. ICT adoption) to foster task and citizenship performance of employees for the benefit of his/her Technical University. It is hypothesized that:

H6: ICT adoption positively mediates the relation between employee engagement and organizational outcomes.

3.8 Conceptual Framework

The conceptual model for this research is shown in Figure 3.1. The conceptual model shows the relationship between employee engagement (as the independent variable), supervisor dark triad (as moderating variable), information communication technology adoption (as mediating variable) and organisational outcomes in the form of task and citizenship performance (as a dependent variable). The framework depicts how the constructs are related and provide the basis to develop the research hypotheses.

Based on pertinent theories and empirical research, the conceptual framework illustrates the proposed connection between the constituent components of employee engagement and organisational outcomes, namely task performance and citizenship performance. These relationships are presented as hypotheses (H1a-b). Furthermore, the present study demonstrates the postulated correlation (H2) between the amalgamation of employee involvement and information and communication technology (ICT) adoption. Hypotheses 3 indicate the direct relation between ICT adoption and organisational outcomes (TP and CP) and it is hypothesised that ICT adoption positively and significantly predict organisational outcomes (Germany et al. 2020; Yunis, et al. 2018; Barba-Sanchez, et al. 2018). The conceptual model further proposes that the components of supervisor dark triad (Machiavellianism, Psychopathy, Narcissism) negatively influence organizational outcomes (Rice et al. 2020; Huang et al. 2019; Pan et al. 2018), representing hypothesised relationship (H4a-d). Hypothesis

5 examines the moderating effect of supervisor dark triad traits on the association between composite of employee engagement as well as composite of organisational outcomes. The link indicates that supervisor dark triad traits moderate the relationship between worker engagement and organisational outcomes such that a high SDT would weaken the engagement–organisational outcomes relationship than low SDT (Koomson 2021; Teng et al. 2021; Beatrice 2020; Bouncken, et al. 2020; Wei and Lin 2019) represented by hypotheses H5. Finally, in hypothesis 6 ICT adoption is proposed to positively mediate the relationship between employee engagement and organizational outcomes (Ahad and Khan 2020; Kapil and Rastogi (2019; Ismail et al. 2018; Al-dalahmeh, Khalaf and Obeidat 2018; Eldor (2017)). Control factors in the hypothesised associations include age, gender, and the number of years spent in the university. The conceptual framework of this study, as depicted in Figure 3.1, is grounded in three prominent theories: Job Demand-Resource Theory, Affective Events Theory, and Activation Theory.

The Job Demand-Resource Theory is the core theory that explains all the relationships in the conceptual framework. First, the theory is useful in clarifying the proposed direct favourable connection between worker engagement and organisational outcomes (task and citizenship performance). Secondly, the theory facilitates comprehension of the proposed favourable direct connection between ICT adoption and organizational outcomes (task and citizenship performance).

The Affective Events Theory is utilized to explain three relationships. First, the theory is helpful in explaining the direct negative effect of supervisor dark triad (Machiavellianism, psychopathy, narcissism) on employee engagement. Secondly, the theory is useful in understanding the direct negative effect of supervisor dark triad (Machiavellianism, psychopathy, narcissism) on organizational outcomes. Thirdly, the theory is used in clarifying the mediating role of ICT adoption in the direct relationship between employee engagement and organisational outcomes (task and citizenship performance).

Finally, Activation Theory is employed as a framework to understand the moderating impact of supervisor dark triad qualities, namely Machiavellianism, psychopathy, and narcissism, on the direct association between employee engagement and organisational

outcomes (task and citizenship performance). Consequently, in this framework, the central internal latent construct comprises organisational outcomes, namely task and citizenship performance, which serve as the intended dependent variable. Therefore, in this conceptual framework, organisational outcomes (task and citizenship performance) is used as the target endogenous latent construct (target dependent variable), while the external implicit components are employee engagement and supervisor/leader dark triad (Machiavellianism, psychopathy, narcissism). ICT adoption serves as a mediator construct, hence it is both an exogenous (independent variable) and endogenous (dependent variable) latent construct.

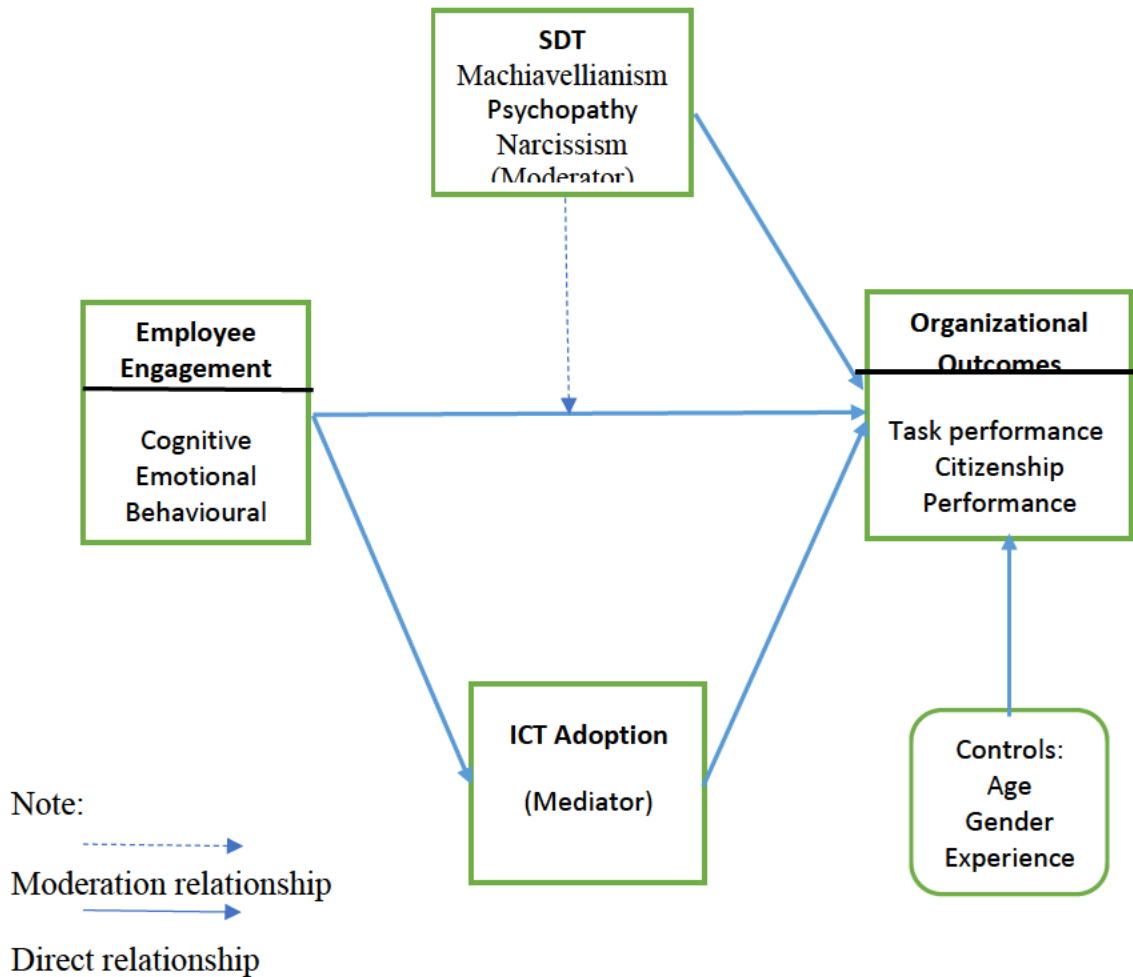


Figure 3.1: The proposed research framework

3.9 Conclusion

This chapter examines the empirical review and conceptual framework of the present investigation. The empirical review comprehensively recorded the methodology and findings of relevant research, while also critically evaluating the methodologies employed in those investigations. The empirical examination was organised in accordance with the research aims of the present study. In the empirical analysis, an initial step involved conducting a literature review on the impact of supervisor dark triad traits (specifically Machiavellianism, psychopathy, and narcissism) on organisational outcomes, namely task performance and citizenship performance. Additionally, the review examined the influence of ICT adoption on these

organisational outcomes. Subsequently, an examination was conducted on the scholarly literature pertaining to the moderating influence of supervisors with dark triad traits on the direct association between employee engagement and organisational outcomes, namely task performance and citizenship performance. The research closely connected to the mediation effect of ICT adoption in the immediate connection between the use of information and communication technology (ICT), employee engagement, and organisational outcomes, specifically in terms of task performance and citizenship performance. Finally, the author included a visual illustration to represent the conceptual framework. This pictorial representation was explained in line with the research objectives and the three underpinning theories. The next chapter presents the methodical approaches of the study.

CHAPTER FOUR

RESEARCH METHODOLOGY

4.1: Introduction

This chapter presents the methodical approaches used in examining the roles of supervisor dark triad trait and ICT adoption in the relationship between employee engagement and organisational outcomes in Technical Universities of Ghana. The chapter includes thorough information on all of the sections for replicability. It describes the research paradigm, approach, design, and techniques used in carrying out the research. This chapter also goes into detail regarding the sampling procedure. There was also information regarding the research tools used and how quantitative data was gathered and analysed. Ethical concerns and data quality were also addressed.

4.2 Research Paradigm

Beliefs about the nature of the social world, what can be known about social life, how research should progress, who can be a knower, what sort of knowledge is prized, and how we come to know govern research practice. These views provide the conceptual underpinnings of research, guiding decisions ranging from topic selection to ultimate representation and distribution of research findings (Leavy, 2017). Paradigms represent the researchers' beliefs and values about the world, the way they define the world and the way they work within the world. In relation to research, the researcher's thoughts and beliefs about any issues explored would subsequently guide their actions. In other words, the paradigm adopted directs the researchers' investigation which includes data collection and analysis procedures. Paradigm has important implications for every decision made in the research process (Kivunja & Kuyini, 2017: 26).

The best way to demonstrate a research paradigm is to look at what it encapsulates: Saunder, Lewis and Thornhill (2019: 133) outlined three underlying perspectives as ontology, epistemology, and axiology. Saunder et al. (2019: 133) opined that ontology is concerned with nature of reality. Ontology raises questions of the assumptions researchers have about the way the world operates and the commitment held to particular views. Two main aspects of ontology are objectivism (which portrays the position that social entities exist in reality external to social actors concerned with their existence) and subjectivism (which holds that social phenomena are created from the perceptions and consequent actions of those social actors concerned with their

existence) (Saunders et al. 2019: 133). Epistemology focuses on what constitutes "accepted, genuine, and legitimate knowledge", in a field of study as well as how researchers may convey the contributions of knowledge they make as a result of their research findings (Saunders et al. 2019:159). Epistemology is concerned with the types of knowledge that are sufficient and legitimate (Gray, 2014). The epistemological question is, "Is knowledge something that can be gained on the one hand, or is it something that must be directly experienced?" (Kivunja & Kuyini, 2017: 27). Epistemology has been described as the method by which an investigator learns the truth and reality, or, to say it another way, how do we know what we know?" The importance of values and ethics in the research process is explained by axiology. It asks about how researchers cope with their values as well as the values of the research participants (Saunders et al. 2019:159). The main research paradigms used in social research and business are positivism, critical realism, interpretivism, post-modernism, and pragmatism (Saunders et al. 2019:144).

4.2.1 Choice of paradigm

The study is grounded on the positivism research paradigm. Drawing on positivism, the researcher utilized quantitative methods in examining the predictive roles of supervisor dark triad trait and ICT adoption on the relationship between employee engagement and organisational outcomes. Within positivism, the study collected observable and real data, utilised standardised, legitimate, and dependable scientific methodologies linking theory to data, and tested hypotheses to establish causal-effect linkage and the results were presented objectively. Specifically, the researcher applied Job Demand-Resource Theory, Affective Event Theory and Activation theory to test the statistical hypotheses using empirical data from the field. Cause and effects relationships was examined using factor loadings, path coefficients and p-values. This approach aligned with the natural sciences and the ontological worldview of objectivity. To guarantee the validity of this instrument, the researcher gathered scientific data, in accordance with the positivist philosophy. A positivist methodology quantifies and measures the observable to provide scientific proof. The idea was to generalise sample findings to the population while remaining an objective researcher.

Positivism

Positivism involves a definite view of social scientists as analysts or interpreters of their subject matter. Positivism may be characterized by its claim that science provides us with the clearest possible ideal of knowledge. According to Saunders et al. (2019:144),

a positivist is biased toward natural sciences and strives to collect and quantify trustworthy evidence regarding an observable social reality to establish causal links that allow for law-generalization. Positivists believe that there is an objective reality “out there” and that, this reality can be discovered through the rigorous process of scientific inquiry (i.e. objective research). Positivists construct hypotheses for testing based on current theories and apply universal laws to describe and predict behaviour and occurrences. Positivists emphasise objectivity in data-collecting procedures and prevent human intervention. Thus, it suggests that researchers should not include their own feelings and values in the research. They also rely on organised techniques and emphasise quantitative observations that can be analysed statistically. Positivists argued that the methodological procedures of natural science might be directly applied to the social sciences. Table 4.1 provides the main characteristics of positivism.

Table 4.1	The Main Characteristics of Positivism
Definition	Positivism is a scientific approach that entails systematic observation and description of phenomena within the context of a model or theory
Ontology (Nature of reality)	It assumes that a single tangible reality exists—one that can be understood, identified, and measured. Real, external, independent one true reality (universalism)
Epistemology (Nature of knowledge)	The researcher contend that knowledge can and must be developed objectively, without the values of the researchers or participants influencing its development. Knowledge, when appropriately developed, is truth—that is, it is certain, congruent with reality, and accurate. Scientific method, Observable and measurable facts, Law-like generalisations, Numbers, Causal explanation and prediction as contribution
Axiology (values of the research processes)	The researcher relies heavily on objectivity and so dismisses the importance of individuals’ subjective experiences and values. This requires the researcher to stay objective and not interact with participants during data collection and not to be involved in the experiment in any meaningful way. Value-free

	research	Researcher is detached, neutral and independent of what is researched	Researcher maintains objective stance
Methodology (How to conduct scientific research)		Typically deductive, highly structured, large samples, measurement, typically quantitative methods of analysis, but a range of data can be analysed	
Researcher's Role		The researcher remains objective, neutral and distant	

Source: Adapted from Saunders et al. (2019:144)

4.3 Approach to Theory Development

A research approach, according to Bryman and Bell (2015), is the detailed plan outlining the actions the researcher takes to carry out the study. Therefore, the decision to conduct a particular research is dependent on the issue that has to be solved (Saunders et al., 2012). Deductive, inductive, and abductive are the three primary research methodologies, according to Saunders et al. (2019: 152). Inductive research methodologies involve generating theories and patterns from specific observations and data, whereas abductive research methodologies focus on constructing conceptual models from qualitative data by seeking the most plausible explanations for the observed phenomena (Bryman, 2016, Reichertz, 2007).

4.3.1 Choice of Research Approach

The philosophical viewpoints supported by the study and declared in the previous sections need objectivism and positivism; hence, the approach adopts the deductive technique to attain the stated objective.

Deductive approach entails the formulation of a theory, which is subsequently submitted to a series of rigorous tests through propositions. It is the most common way to do research in the natural sciences, where laws provide the basis for explanations, make it possible to predict events before they happen, and explain why they happen (Saunders et al. 2019:154). In order for their study to be replicable and generalizable, researchers that employ the deductive method also implement a highly organised methodology.

On the basis of JD-RT, AET, and Activation theory, hypotheses were constructed to investigate the effect of SDT and ICTA on employee engagement and organisational outcomes (task and citizenship performance), as well as the moderating and mediating roles of SDT and ICTA. Additional data was gathered by a survey of large samples of respondents, and the study was done pursuant on well-documented and established methodological standards, allowing for replication. Hinkin (1998) suggests using deductive reasoning if the theoretical foundation provides enough facts to generate the initial collection of things. This strategy requires a comprehensive literature search to define the examined concept and explain the phenomena.

4.4 Research Design

Having a rigorous research design is crucial in the research process. In planning research, the researcher commences with the overall purposes of the research and then constructs a research design to address these. According to Parahoo (2014:164), research design is a complete explanation of the precise techniques of data collecting, including where the data will be collected, when it will be collected, and how the received data will be analysed. Creswell (2009: 22) opined that research designs are strategies and procedures that span broad assumptions to particular data collecting and analysis. This strategy has many areas that inform the selection such as the researcher's worldview assumptions, procedures of inquiry, data collection, analysis, and interpretation. The choice of research design is also based on the nature of the research problem or issue being addressed, the researchers' own experiences, and the audiences for the study. The typical ways to design research include quantitative, qualitative, and mixed research methodologies (e.g., Hair, Page, and Brunsveld 2020; Saunders et al. 2019; Taherdoost 2016).

Qualitative research methodologies focus on exploring phenomena through in-depth, non-numerical data, emphasizing understanding experiences, meanings, and social contexts through methods like interviews, focus groups, and observations. Mixed research methodologies combine both qualitative and quantitative approaches to provide a comprehensive analysis by leveraging the strengths of both, allowing for a more nuanced understanding of research questions through the integration of statistical analysis and detailed narrative data (Creswell, 2014: 22; Saunders et al. 2016:168).

4.4.1 Choice of Research Design

In this present study, the researcher adopted quantitative research design - explanatory and causal design to examine the cause and effect of the perceived relationship because the objective was to ascertain extent of the influence that supervisor dark triad trait and ICT adoption have on the perceived relationship.

Quantitative research examines the relationship between variables using predetermined organised data collecting tools to evaluate hypotheses and current theory (Hair et al. 2019:161). (e.g., Saunders et al. 2016:166; Antwi and Hamza 2015:220). Quantitative research values breadth, statistical descriptions, and generalizability. Quantitative approaches to research center on achieving objectivity, control, and precise measurement. Methodologically, this approach rely on deductive designs aimed at refuting or building evidence in favour of specific theories and hypotheses (Leavy, 2017: 79; Saunders et al. 2016:166). Marianne Fallon (2016: 3) refers to quantitative research as a “top down process”. Quantitative approaches are most commonly used in explanatory research investigating causal relationships, associations, and correlations (Leavy, 2017: 79).

Explanatory and causal designs are ideal for hypothesis testing in quantitative study. This approach enables researchers to formulate specific hypotheses about relationships between variables and to support or refute these hypotheses. Erickson (2017: 81) opined that causal research design is specifically targeted at proving a hypothesis. The major advantage of causal research is that it is the only way to truly establish causation, that changing one thing results in a measurable impact somewhere else. Consequently, this research design has the most reliable results, if done properly. On the downside, it can be the most time-consuming, most costly, and most logistically complex of all the research designs (Erickson, 2017: 81).

4.5 Population

In statistics, the population is the complete set of items from which a researcher extracts data for a statistical study. It can be a group of individuals, a set of elements, group of items, etc. It forms the data set for a study. The population under consideration, referred to as the target population, is the group to which the findings of the study may be applied in a broader context (Omair, 2014). According to Saunders et al. (2016: 274), the

concept of population refers to the whole set of components from which a sample might be selected. Fraenkel and Wallen (2009: 91) argued that the actual population (called the target population) to which a researcher would really like to generalize is rarely available. The population to which a researcher is able to generalize, therefore, is the accessible population. The former is the researcher's ideal choice; the latter, his or her realistic choice. The more narrowly researchers define the population, the more they save on time, effort, and (probably) money, but the more they limit generalizability. (Fraenkel & Wallen, 2009: 91). In this study, the population comprised staff of the ten (10) technical universities in Ghana. The target population encompass the academic and non-academic staff of five (5) technical universities. The distribution of the target population is shown in Table 4.2. These technical universities were chosen based on their homogeneity in regards to the structure and character of events, in addition to the fact that they follow the same practices. The target population was estimated to have a staff count of 3003 workers.

Table 4.2: Estimated Population of selected Technical Universities in Ghana

Technical Universities	Number of departments	Total Population
University V	18	368
University W	16	725
University X	24	732
University Y	23	545
University Z	20	633
Total		3,003

Source: Directorate of Human Resources of the Technical Universities

4.5.1 Inclusion and Exclusion Criteria

The prerequisite for participating in the study was that the person must be a full-time teaching or administrative staff who had worked with the institutions for a minimum of one year during the Covid-19 era. This was so because such worker would have spent a reasonable length of time to provide reliable information. Staff of all department in the various universities was targeted to make it more representative and to generalise the findings of the study. Heads of department, Heads of Faculties (Deans) and Heads of section or unit were excluded because of the supervisory nature of their work which

might influence the study. Again part-time staff of the university were excluded because they would not have spent a reasonable length of time to provide reliable information.

4.6 Sample

A sample refers to a smaller, representative subset of a larger population from which data or information is collected. Leavy (2017: 71) reported that a sample is the number of individual cases that a researcher ultimately draws and from which/whom data is generated. Similarly, Bruce and Bruce (2017:92) defined a sample as a subset of the population that is taken into consideration for inclusion in a study or a subset of measures taken from a population in which the researcher is interested. There are various reasons why samples are used instead of the entire population. Saunders et al. (2009: 234) identified some of the reasons why samples are preferred: First, in certain cases, surveying the entire population might be impractical. Second, the cost of dealing with the entire population might be prohibitive. Thirdly, it might be time consuming dealing with the entire population; and lastly, one might want a quick results from a study and might not have time to deal with the entire population. In this study the sample comprised a subset of the full-time teaching and non-teaching staff of the five technical universities in Ghana, from whom empirical data were gathered.

4.6.1 Sample Size

The costs of studying the entire population usually are prohibitive to both researchers and those being studied in terms of privacy, time, and money. As a result, a sample from a given population must be selected. Since the sample is only part of the whole, generalization usually involves error. Sample size has an important and controllable influence on the statistical precision or sampling error with which population values can be estimated. In general, increased sample size is associated with decreased sampling error (Dattalo, 2018: 180). Sample size describes the number of cases included in a study to adequately reflect the population. The important question to ask whenever samples are preferred in a research is “How do you determine what the sample size should be”?

Saunders et al (2009: 210) identified the following considerations for sample size determination:

- the confidence one needs to have in the data – that is, to the degree of assurance that the collected data accurately represents the characteristics of the entire population;
- the margin of error that one can tolerate – that is, the level of precision required for any estimates derived from the sample;
- the types of analyses one would undertake – in particular the number of categories into which one wishes to subdivide their data, as many statistical techniques have a minimum threshold of data cases for each cell (e.g. chi square); and to a lesser extent;
- the proportion of the entire population from which the selection is chosen.

Similarly, Bordens and Abbott (2014: 284) contended that the size of sample is vital in survey; and that one has to select an economic sample. That is one that includes enough participants to ensure a valid survey. They underscored two considerable factors in deciding on the size of the sample needed to ensure a valid survey: The amount of acceptable error and the expected magnitude of the population proportions. The question of acceptable error arises because most samples deviate to some degree from the population (sampling error). When determining sample size, the researcher must decide the acceptable amount of sampling error. Unfortunately, there are no broad rules of thumb as to the acceptable margin of error. It depends in part on the use to which researchers will put their results (cited in Bordens & Abbott, 2014: 284). If one plans to apply research results to implement changes in behaviour, one may want a small margin of error. If one is interested simply in describing a set of characteristics, a larger margin of error might be tolerated. A good way to determine the acceptable margin of error is to look at literature describing similar surveys to see what margin of error was used. (Bordens & Abbott, 2014: 284).

Quantitative research favours larger sample sizes. For example, in survey research, accuracy increases with larger samples. However, one must also consider the additional costs often associated with larger samples. There are sample size calculators that may be employed to determine the ideal number of samples for a specific study, although population size, confidence level, and margin of error must be taken into account (Leavy, 2017: 72). Following the Krejcie and Morgan's (1970:609) table for calculating

sample size and given a target population of 3003 in this study, a sample of 341 workers was chosen from the population.

Table 4.3: Sample Size Determination Table

N	S	N	S	N	S
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	175	2000	322
55	48	320	181	2200	327
60	52	340	191	2400	331
65	56	360	196	2600	335
70	59	380	205	2800	338
75	63	400	210	3000	341
80	66	420	217	3500	346
85	70	440	226	4000	351
90	73	460	242	4500	354
95	76	480	248	5000	357
100	80	500	260	6000	361
110	86	550	265	7000	364
120	92	600	274	8000	367
130	97	650	278	9000	368
140	103	700	179	10000	370
150	108	750	186	15000	375
160	113	800	201	20000	377
170	118	850	214	30000	379
180	123	900	234	40000	380
190	127	950	254	50000	381
200	132	1000	269	75000	383
210	136	1100	285	100000	384

Source: Krejcie and Morgan (1970); N = population size; S = sample size

4.6.2 Sampling Techniques

The quality of a piece of research not only stands or falls by the appropriateness of methodology and instrumentation but also by the suitability of the sampling strategy that has been adopted. Thus, sampling is a fundamental procedure that involves the deliberate selection of a subset from a larger group (the sampling population) to serve as the foundation for estimating or forecasting the occurrence of an unfamiliar piece of information, condition, or result pertaining to the larger group. Singh (2007:89) defined sampling as the process of selection of sampling units from the population to estimate population parameters in such a way that the sample truly represents the population. Researchers aim to draw conclusions about populations from samples by using inferential statistics to determine a population's characteristics by directly observing only a sample of the population. He noted that samples are drawn from populations in a manner that allows them to provide an indication of the parameters. The basic idea of sampling is to extrapolate the statistics computed from sampled data to draw conclusions about the larger population from which the sample was obtained (Singh, 2007:89).

Saunders et al. (2019:296) classified sampling processes into two distinct categories: probability or representative sampling approaches, and non-probability sampling approaches. According to Saunders et al. (2019: 296), probability sampling ensures that every element within the population has an equal opportunity of being chosen for inclusion in the sample. In contrast, non-probability sampling relies on subjective judgement rather than providing an equal chance for members of the target population to be picked. This study utilised a combination of probability and non-probability sampling methods to choose a sample size of 341 individuals from a target population of 3003. The study originally employed convenience and purposive sampling methods, which are non-probability approaches, and afterwards utilised proportional stratified sampling, which is a probability-based strategy.

4.6.2.1 Convenience sampling technique

Convenience sampling involves selecting haphazardly those cases that are easiest to obtain for your sample. The sample selection process is continued until the required sample size has been reached (Saunders, et al., 2007:234). Similarly, Etikan, Musa, and Alkassim, (2016) noted that convenience sampling is a form of sampling in which the

sample is taken from individuals or groups of people that are easy to contact. Fraenkel and Wallen (2009:98-99) opined that the obvious advantage of convenience sampling is in convenience, but such a sampling technique is likely to produce biased samples. The researchers noted that convenience sampling were quite likely be biased since anyone who was not present at the day and time of the selection had no chance of being selected. In addition, those who were unwilling to share their views were not included, and those who agree to be part of the study were probably be individuals who hold strong opinions one way or the other about the problem being investigated. In view of these possible sources of bias, the convenience samples do not generate representative samples and should be used cautiously. (Fraenkel and Wallen, 2009:99). In this study, the researcher conveniently selected five (5) technical universities from Accra, Kumasi, Takoradi, Cape Coast and Koforidua in the Greater Accra, Ashanti, Western, Central and Eastern Regions of Ghana respectively.

4.6.2.2 Purposive sampling technique

In addition to the convenience technique, purposive sampling was utilized to select full-time teaching and non-teaching staff of the five technical universities for the study. This is because supervisors (HoDs and Deans) at the institutions could not substitute other staff who suitably fit in the research position to enable the right and accurate information to be obtained to satisfy the objectives of the study. On occasion, based on previous knowledge of a population and the specific purpose of the research, investigators use personal judgment to select a sample. Researchers assume they can use their knowledge of the population to judge whether a particular sample will be representative. (Fraenkel and Wallen, 2009:99). They further noted that purposive sampling is different from convenience sampling in that researchers do not simply study whoever is available but rather use their judgment to select a sample that they believe, based on prior information, will provide the data they need (Fraenkel and Wallen, 2009:99).

Similarly, Saunders, et al. (2019: 321), opined that purposive sampling enables a researcher to use his/her own judgment to select cases that will best enable them to answer research question(s) and achieve their objectives. Such samples cannot, however, be deemed to be statistically indicative of the entire population. The logic on which the researcher base his/her strategy for selecting cases for a purposive sample

should be dependent on the research question(s) and objectives. Fraenkel and Wallen, (2009:99) argued that the major disadvantage of purposive sampling is that the researcher’s judgment may be in error—he or she may not be correct in estimating the representativeness of a sample or their expertise regarding the information needed.

4.6.2.3 Proportional stratified sampling

In order to obtain a representative sample of the target population of the selected (five) technical universities in Ghana, proportional stratified sampling technique was employed to select 341 full-time teaching and non-teaching staff. This technique allowed the staff from each technical university to have equal and independence chance of being selected, making it more accurate and representative especially when a population exhibits significant variation (Saunders et al. (2019:311). According to Saunders, et al. (2007:221), stratified random sampling is a sampling technique in which a population is divided into two or more relevant and significant strata based on one or a number of attributes. In effect the sampling frame is divided into a number of subsets. A random sample (simple or systematic) is then drawn from each of the strata. Consequently, stratified sampling shares many of the advantages and disadvantages of simple random or systematic sampling. Dividing the population into a series of relevant strata means that the sample is more likely to be representative, as one can ensure that each of the strata is represented proportionally within the sample. After stratifying the target population into five strata (technical universities), the researcher employed a simple random sampling method to choose the required number of employees from each technical university. Table 4 depicts the distribution of proportional samples across strata.

Table 4.4: Proportional Stratified Sampling Estimation

Technical university	Target population	Estimation	Sample size
University V	368	$(368/3,003)*341$	42
University W	725	$(725/3,003)*341$	82
University X	732	$(732/3,003)*341$	83
University Y	545	$(545/3,003)*341$	62
University Z	633	$(683/3,003)*341$	72
Total	3,003	-	341

4.7 Research Instruments

Within the domain of scholarly inquiry, the preparatory stage for gathering data is commonly referred to as instrumentation (Fraenkel and Wallen, 2009:110). This procedure goes beyond just selecting or creating the research tools; it involves deciding on the procedures and situations in which these tools will be utilised. The careful coordination of the instrumentation phase plays a crucial role in guaranteeing the precision and thoroughness of data gathering in empirical research. Fraenkel and Wallen (2009:110) have delineated four overarching categories of questions that guide the development of instruments, encompassing aspects pertaining to study design, techniques of data collecting, dependability, and validity. The categories of questions are:

1. Where will the data be collected? This question refers to the location of the data collection. Where will it be? In a classroom? A schoolyard? A private home? On the street?
2. When will the data be collected? This question refers to the time of collection. When is it to take place? In the morning? Afternoon? Evening? Over a weekend?
3. How often are the data to be collected? This question refers to the frequency of collection. How many times are the data to be collected? Only once? Twice? More than twice?
4. Who is to collect the data? This question refers to the administration of the instruments. Who is to do this? The researcher? Someone selected and trained by the researcher?

In the field of information acquisition, there are two fundamental methods for gaining knowledge about a particular circumstance, individual, dilemma, or phenomenon. Frequently, researchers are required to collect essential information directly. In contrast, there are times when the necessary information is readily available but must be extracted. Using these overarching information collection methods, data can be divided into two primary categories: Data from both primary and secondary sources (Kumar, 2011: 132). In the domain of primary data collection, researchers use a variety of techniques, such as observation, interviews, and questionnaires, to gather firsthand information. This dynamic range of data collection methods highlights the variety of

methodologies available to researchers when conducting empirical investigations. The researcher adopted questionnaire as the primary data collection.

4.7.1 Questionnaire

A questionnaire, as described in scholarly literature, is a formal written instrument consisting of a series of structured queries designed to elicit recorded replies from those participating in a study. According to Sekaran and Bougie (2016:142), a questionnaire is a predetermined set of questions that respondents answer by selecting their replies from a limited range of possibilities. Participants, within the framework of questionnaires, actively participate by reviewing the questions, comprehending the expected replies, and then recording their answers. The differentiation between an interview schedule and a questionnaire is based on the manner in which information is gathered. In an interview schedule, the interviewer directly poses questions to the participants, but in a questionnaire, respondents independently record their own responses (Kumar, 2011: 138). According to Williman (2011:97), the utilisation of a questionnaire allows researchers to organise questions and obtain answers without requiring face-to-face communication with each participant. Questionnaires can be distributed to respondents through several methods, such as in-person administration, electronic delivery, or mail-based dissemination (Sekaran & Bougie, 2015:143).

Questionnaires serve as a flexible means of gathering data, offering a standardised framework that is simple to use and comfortable for anyone involved in the study. They provide a cost-effective and efficient method for gathering data from a wide range of instances that cover significant geographical areas. Questionnaires are a notable method of maintaining impartiality as they allow for the avoidance of personal researcher influence. This enables the exploration of delicate topics, increasing the possibility of obtaining honest replies. Nevertheless, the process of creating and refining questionnaires requires a significant amount of time and specialised knowledge. The process of designing questionnaires requires the careful consideration of brevity and simplicity in order to promote participant understanding, hence restricting the use of complex question structures. Recognising the variability in people' proficiency in questionnaire completion, the use of these tools necessitates a deliberate and careful approach (Walliman, 2011:97).

One notable pattern seen in scholarly investigations is the widespread utilisation of questionnaires in research surveys and quantitative research methodologies, as emphasised by Saunders et al. (2019). This methodological technique leverages the organised character, efficiency, and wide use of questionnaires in quantitative research.

4.7.3.1 Methods of Questionnaire Deliveries

There are three methods of delivering questionnaires: Personally and by post or through the internet (Walliman, 2011:97). The advantages of personal delivery are that respondents can be helped to overcome difficulties with the questions, and can be persuaded and reminded in order to ensure a high response rate. Postal questionnaires are used when a large number of responses are sought, particularly when they are in different locations. The correct address for each respondent is required and postal costs must also be taken into account. The rate of response for postal questionnaires is difficult to predict or control, particularly if there is no system of follow-up. Internet questionnaires are the cheapest and least time consuming method of delivery. Although it is easy to get a blanket coverage by random delivery, response rates tend to be very low and it is difficult to know how representative the sample will be. For more structured deliveries, email addresses are required to pinpoint responses from the chosen sample. (Walliman, 2011:97).

Whatever type of questionnaire to use commonly have two types of questions. Walliman (2011: 97-98) identified closed format and open format questions. In closed format question, the respondent chooses from a set of given answers. Closed format questions tend to be quick to answer, easy to code and require no special writing skills from the respondent. However, they do limit the range of possible answers. Open format question, on the other hand require the respondent to freely answer question in their own content and style. Open format questions tend to permit freedom of expression and allow the respondents to qualify their responses. This freedom leads to a lack of bias but the answers are more open to researcher interpretation. They are also more demanding and time consuming for respondent and more difficult to code.

4.7.3.2 Considerations for Effective Questions

Kumar (2011) emphasises the critical importance of carefully crafting the phrasing and tone of questionnaire questions. This emphasis arises from an understanding that the

quality and accuracy of information gained from replies are heavily reliant on these criteria. As a result, great thought must be given to the formulation of questions. Kumar suggests five critical factors to consider while creating good questionnaire questions:

1. **Use Simple terminology:** It is critical to use terminology that is simple and familiar. This takes into consideration respondents' different educational levels, some of whom may be unfamiliar with technical terms. Given that researchers are unable to explain questions during data collection, it is critical to pick terms that respondents are likely to understand. A pre-test can give insight into what is easily understood by responders.
For example, the question "Does anyone in your family suffer from dipsomania?" may confuse respondents owing to the word "dipsomaniac," resulting in ambiguous or erroneous replies (Kumar, 2011: 145).
2. **Avoid Ambiguity:** To avoid varied interpretations by different responses, questions should be devoid of ambiguity. Ambiguous questions can elicit a wide range of responses, jeopardising the validity of data-driven conclusions.
3. **Beware of Double-Barrelled Questions:** Double-barrelled questions, which include more than one enquiry, might perplex respondents because it is unclear to which element they are replying. The question "How often and how much time do you spend on each visit?" for example, embeds two other inquiries inside it, confusing respondents' replies (Kumar, 2011:146).
4. **Avoid Leading Questions:** Due to their substance, structure, or language, leading questions discreetly influence respondents towards a certain response. These questions are biased by nature and can evoke either positive or negative emotions, limiting objective responses. For example, the question "Unemployment is increasing, isn't it?" includes a predetermined premise that biases the response direction.
5. **Avoid Assumption-Based Questions:** Assumptions-based questions presuppose a specific category or circumstance, which can lead to mistakes in replies. For example, questions such as "How many cigarettes do you smoke per day?" or "What contraceptives do you use?" may incorrectly presume habits or preferences, potentially resulting in inaccurate findings. (Kumar, 2011:147)

Kumar's advice emphasises the critical need of intelligent question construction in assuring data quality and dependability, which is critical in the process of empirical inquiry.

4.7.4 Questionnaire Design

To collect quantitative data, a structured and closed-ended questionnaire was employed, in accordance with the aims and design of this study. The information was gathered specifically through the use of a structured online questionnaire created with Google Forms. Many earlier research have used digital technologies such as Google Forms (e.g. Hanu, Amegbe, Yawson, and Mensah 2022). The Covid-19 preventive measures included the use of an online questionnaire. Furthermore, as compared to the more typical technique of a paper questionnaire, the online structured questionnaire permitted the gathering of a huge quantity of data quickly, with ease, and at a very low cost (Hair et al. 2019:204; Ball 2019:4). This study's data collection method was appropriate, as questionnaires are also most beneficial in an explanatory approach (Saunders et al. 2019:505). The weblink questionnaire also simplified data collecting and input.

Two online questionnaires were developed because data collection occurred in two phases. The biographical profiles of the respondents were gathered from both questionnaires. The first questionnaire c included questions about employee engagement (independent variable) and organisational outcomes (dependent variable). The second questionnaire contained questions regarding the supervisor dark triad (the moderating variable) and ICT adoption (the mediating variable). This procedure was used to assist reduce common method variance (Podsakoff et al., 2003). In order to combine the data sets, respondents were required to generate and input a seven-digit code instead of their identities to ensure anonymity and as evidence that they have read and consented to participate in the survey (Greenbaum et al. 2014:1192).

4.7.5: Measures

The questionnaire had six (6) sections: Section A covered the demographic characteristics including Sex, Age, Highest level of education, duration of employment at a technical university and Category of Staff (i.e. whether teaching or non-teaching). Section B was on the employee engagement questionnaire while Section C and D

covered the questionnaire on organisational outcomes with two dimensions namely task performance and citizenship performance. Section E of the questionnaire was on supervisor dark triad trait items and finally Section F of the questionnaire was on information communication technology adoption. There are reliable scales available in the literature for all of the constructs in my investigation. As a result, the constructs were measured using previously validated scales in this study after I have pre-tested and reworded few items to ensure clarity based on input from the pre-test. These are further elaborated in the next paragraphs.

4.7.5.1: Employee Engagement

The assessment of employee engagement was conducted by employing the Employee Engagement Scale (EES) developed by Shuck et al. (2017:12). The EES comprises three distinct dimensions, each consisting of five items. These dimensions include cognitive engagement, which pertains to the level of focus exhibited during work activities (e.g., "I demonstrate a high level of concentration while performing my tasks"); emotional engagement, which refers to the extent of attachment felt towards one's job (e.g., "I experience a profound sense of belongingness to my current position"); and behavioural engagement, which encompasses the willingness to exert additional effort without explicit prompting (e.g., "I am inclined to invest extra energy in my work without requiring external requests"). The measurement of all items was conducted using a 5-point Likert scale, with a rating range ranging from 1 (strongly disagree) to 5 (strongly agree). The Employee Engagement Scale (EES) established by Shuck et al. (2017) was selected due to its foundation on Kahn's (1990) first notion of personal engagement. This scale is regarded as distinctive in its conceptualization and stands out from other engagement measures in terms of its emphasis and definition (Shuck et al., 2016). Shuck et al. (2017) assert that Employee Engagement Survey (EES) serves as a reliable measure of an individual's active psychological state, including several aspects of the immediate work experience, including work, job, team, and the active engagement in work (p.4). The Cronbach's alpha coefficient for the EE scale was found to be 0.986 in the summative assessment.

4.7.5.2: Task Performance

To assess employees' job performance, the task performance scale included eight (8) items adapted from Goodman and Svyantek (1999:261). Examples are "My performance meets job objectives well" and "I always meet specific job responsibilities" are two examples. On a five-point Likert scale, participants were asked to express their degree of agreement or disagreement with the statements, with possibilities ranging from strongly agree (5) to strongly disagree (1). The Cronbach's alpha value was 0.969.

4.7.5.3: Citizenship Performance

Citizenship performance is the second dimension used in the study as organisational outcomes and the measurement scale encapsulate eight (8) statements adopted from Coleman and Borman (2000: 5) to measure the level of citizenship performance. A sample included "At work, I do things to help others when it's not part of the job". Cronbach's alpha was 0.983. Participants were requested to express their level of agreement or disagreement with the statements using a five-point Likert scale, with options ranging from strongly agree (5) to strongly disagree (1).

4.7.5.4: Supervisor Dark Triad

In accordance with the Dirty Dozen scale developed by Jonason and Webster (2010:429), a set of twelve statements was utilised to evaluate the presence of Dark Triad Traits in supervisors. These traits were measured across three subscale dimensions, each containing four items. The dimensions included Machiavellianism (e.g., "My supervisor exhibits manipulative behaviour to achieve personal goals"), narcissism (e.g., "My supervisor seeks admiration from others"), and psychopathy (e.g., "My supervisor demonstrates a lack of remorse"). The computed value of Cronbach's alpha for the summative assessment was 0.942. The measurement of all items was conducted using a 5-point Likert scale, with a rating of 1 indicating strong disagreement and a rating of 5 indicating strong agreement.

4.7.5.5: ICT Adoption

ICT adoption was measured using the seven-item scale developed by Jaganathan et al. (2018:7) to reflect the extent of ICT adoption among the teaching and non-teaching personnel of the study. "I am willing to provide online information to students and other

clients" is an example. The coefficient of internal consistency (alpha) was 0.909. On a 5-point Likert scale, where 1 = strongly disagree and 5 = strongly agree, all items were measured.

4.7.6 Piloting the Questionnaire

Piloting involves a test to find out if the instrument of data collection would obtain the results the researcher requires. A pilot study helps principally to increase the reliability, validity and practicability of the questionnaire. De Costa, Crowther and Maloney (2019:152) noted that the main purpose of a pilot study is to refine questions on the research instrument to avoid ambiguity and biases for proper data collection and to ensure that the instrument's content is correct. Newing (2011:65) also said that the main goal of a pilot study is to find out how long it would take the real respondents to fill out the questionnaire and to see if the questions were too hard or too easy, or if the questionnaire was the right length (not too short or too long), so that any questions are cleared up before the real respondents fill it out. Scholars have advised that questionnaires should be pilot tested with participants who are comparable to the target participants (Saunders et al. 2019:540). In this study, the pre-test was conducted with a sample of fifteen (15) operational staff from the Faculty of Business Studies at Takoradi Technical University. The fifteen respondents were chosen on purpose based on inclusion and exclusion criteria.

This is how the pilot test was carried out:

- Participants were given questionnaires in the same way they would receive them during the main study;
- Participants were asked to mark any questions they found challenging or unclear.
- The researcher also kept track of how long the pilot group took to complete the questionnaires so she could determine whether or not this time was reasonable.
- The difficult questions were then eliminated:
- Complicated questions that were not answered completely or according to plan were reworded and scaled.

Any errors discovered during the pre-test was revised before the actual data collection. The pre-test results was excluded from the main dataset.

4.8 Data Collection Procedure

The researcher obtained a gatekeeper's permission letter from the technical universities. The approval from the gatekeeper confirmed that the researcher had been granted authority to collect primary data from the institutions. Prior to conducting the survey, the human resource managers of the selected universities were contacted to discuss significance of the study, the items measurement, and the utilization of the institutions' email and official WhatsApp platforms to administer the questionnaire. The hyperlink of the questionnaire was shared with HR officers purposively recruited from the universities. The HR officers, in turn, shared the link on the institutional emails or staff portals to have access to the respondents. According to the preliminary research (pre-test), each set of questionnaires required approximately 12 minutes to complete. In terms of the procedure, the structured questionnaire was administered online. When the link was received by respondents, they were expected to click on it to access the title page of the questionnaire. After reading the information on the title, they then click on "NEXT" to access the questionnaire items "ONLY" if the respondent had agreed to voluntarily take part in the research. After responding to the items, the respondents then click on Submit at the bottom of the final section of the questionnaire. If everything went through, a notification was sent that their responses were submitted automatically.

To play an indirect but active role in the administration of the questionnaire, the researcher obtained the phone numbers of the HR officers in charge of sharing the web link and reminded them on a regular basis, via phone calls and WhatsApp messages, to encourage their colleagues to participate in the survey. The researcher provided weekly updates to the HR managers on the amount of completed questionnaires received in order to motivate the HR officers to continue pressing for the data.

The data administration process was done at two stages of four weeks interval. The first (Time t1) was the demographic data of the respondents, and data on employee engagement and supervisor Dark Triad variables. The second (Time t2) was the demographic data and data on the concepts organisational outcomes (task performance and citizenship performance) and information communication technology adoption. This also ended after four weeks, after which the hyperlink was closed. For the sake of combining the data sets, respondents were required to generate and enter a seven-digit code rather than their names to ensure anonymity and also as a proof that they have read and agreed to participate in the survey (Greenbaum et al. 2014:1192). As an

illustration, one may use the first letters of their first and last names (e.g., 'GY' for Georgette Yawson), the corresponding day of the week on which they were born (e.g., 'F' for Friday), as well as the numerical representation of their birth day and month (e.g., '0905' for 9th May). Consequently, participants were required to generate a distinct seven-digit code independently and input it into the designated section on the initial page of the survey. The assigned alphanumeric identifier for the previously described instance would be GYF0905. The use of this administrative procedure was implemented with the intention of mitigating the occurrence of common method variance, as outlined by Podsakoff et al. (2003).

4.8.1 Controlling Common Method Bias

The concept of "common method bias" (CMB) pertains to the situation in survey responses where there is a linkage between the respondent's answers to both the independent and dependent variables. According to Hair, Page, and Brunsveld (2020:293), According to Podsakoff, MacKenzie, Lee, and Podsakoff (2012:540), the presence of common method bias (CMB) might introduce measurement error in the estimated association between variables, such as employee engagement and citizenship performance, when particular evidence suggests its existence. Hence, the outcomes pertaining to the associations among the constructs and other noteworthy indicators may potentially yield imprecise estimations of the extent and significance of the interrelationships between variables, or erroneous estimations of the dependability and validity of the constructs within the research model (Malhotra, Schaller, and Patil 2017:195).

The presence of common method bias (CMB) is a challenge for the use of self-report questionnaires in data collection, particularly when the same respondents provide data for both dependent and independent variables simultaneously (Podsakoff and Organ, 1986; Podsakoff et al., 2012). The occurrence of common method bias (CMB) can also be attributed to respondents' inability to provide accurate responses (MacKenzie and Podsakoff, 2012:544). One possible explanation for this phenomenon may be attributed to the formulation of the questions, which may have been characterised by a lack of clarity or difficulty in comprehension. This study was based on a cross-sectional self-reported survey. Consequently, the components underwent examination by a questionnaire employing a consistent and standardised scale, thereby constituting a singular investigation. The use of this particular technique included the possibility of

shared method variance distorting the observed relationships among the constructs under investigation (Spector et al., 2019:855). Several scholars (MacKenzie and Podsakoff, 2012; Viswanathan and Kayande, 2012; Chang et al., 2010; Podsakoff et al., 2003) have identified two primary strategies for addressing common method variance (CMV), namely ex-ante and ex-post techniques. Initially, ex-ante measures encompass a collection of procedural interventions suggested for implementation by researchers at the initial phases of questionnaire development, with the aim of mitigating the potential occurrence of common method variance (CMV). The procedural interventions described below are mostly preventive in nature, since their objective is to enhance participants' motivation to reply to a questionnaire and generate authentic, unbiased answers. The literature suggests several prevention methods, such as gathering model construct data from multiple sources, collecting data on key constructs across various timeframes, locations, or media, ensuring that questions are straightforward, unambiguous, and specific, and utilising pretesting techniques to enhance and refine item wording (MacKenzie & Podsakoff, 2012; Podsakoff et al., 2003; Podsakoff, MacKenzie, & Podsakoff, 2012). Furthermore, the term "ex-post" pertains to the phase of data analysis in which researchers employ various statistical approaches to assess the effectiveness of previous procedural procedures in identifying and minimising the effects of CMV.

In this study, the ex-ante technique the researcher adopted include ensuring the respondents' anonymity and secrecy and even going so far as to delete the respondents' uncertain and inexperienced related actions; collecting data in phases which made it difficult for respondents to predict any relationship between, or among, the constructs and pretesting to improve the wording of items. After employing procedural techniques of control, the post-hoc approach employs statistical approaches to detect and control method bias (Podsakoff et al. 2012:553). Several ex-post statistical methods have been proposed for evaluating the efficacy of ex-ante treatments. Rodríguez-Ardura¹ and Antoni Meseguer-Artola (2020:2) group them into three categories. First is the Harman's single-factor test, and the correlation matrix process which only allow for the detection of CMV. Second group is the directly measured latent factor technique and the measured response style technique allow researchers to detect CMV, enable them to measure CMV and eliminate its negative effects. The third category is the correlation-based marker technique, the general factor covariate technique, the

confirmatory factor analysis (CFA) marker technique and the unmeasured latent method factor technique. These techniques effectively detect and control CMV and can be utilised without the need to identify hypothetical CMV sources.

4.9 Data Analysis

Data analysis, according to Sekaran (2003:301), entails extracting usable information from raw data and applying essential statistical analysis so that it can be presented in a more coherent and understandable manner. There are two techniques to analysing quantitative data: (1) by using descriptive statistics to understand the data and (2) by employing statistical tests to examine hypotheses. Statistical Package for Social Sciences (SPSS) version 25 for Windows was used for data processing and descriptive analysis of the demographic variables. As mentioned in the data collection procedure, the same respondents provided quantitative data in two ways. The initial collection contained 318 replies and comprised demographic data, employee engagement, and the superior dark triad. The second set of questions produced 294 responses and covered demographic parameters as well as items on organisational outcomes (task performance and citizenship performance) and ICT adoption. The digital consent codes were then utilised to match responses from both phases. It was observed that 24 of the survey respondents who took part in the first phase did not take part in the second phase. Likewise, a total of eight participants in the latter phase of the survey did not partake in the initial phase. During the early pre-processing, 32 replies were initially omitted from the dataset due to the lack of digital identities. Given this context, 286 individuals responded to both surveys, which represents the total number of responses received.

Some respondents in a survey may not answer to every item on the questionnaire. In this case, the researcher must account for missing data and ensure that the data is valid, comprehensive, and consistent (Hair et al. 2020:327). According to Hair, Hult, Ringle, and Sarstedt (2017:56), if the percentage of incomplete data in a survey exceeds 15% of the questionnaire items. To achieve this goal, the Excel file was preprocessed in order to eliminate and account for missing data. At the end of the accounting method, eight incomplete responses were removed. The dataset for the study had 280 valid responses, reflecting a response rate of 84% of the total sample size of 341.

The responses to the questions on the model constructs were pre-coded and fixed to a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Consequently, only the demographic data were coded during data pre-processing prior to exporting it to SPSS. Additionally, SPSS (version 25) was used to conduct a descriptive analysis of the demographic profiles of the respondents. This was due to the categorical nature of the demographic information gathered for this study. As a result, descriptive statistics were deemed adequate for the demographic data analysis, and the results were presented in tables with frequencies and percentages.

In accordance with the guiding concept proposed by Ringle and Sarstedt (2018:6), the remaining portion of the dataset was subjected to analysis utilising Structural Equation Modelling (SEM) and the Analysis of Moment Structures (AMOS, version 24.0) software package (Byrne, 2010). Structural equation modelling (SEM) is a method that is well-suited for investigating research inquiries that encompass many latent and observable factors. It particularly focuses on examining the mediated and moderated impacts of these variables on dependent variables. Additionally, SEM facilitates the integration of data analysis for the goal of making inferences. This assertion is supported by Hair et al. (2018:5) and Byrne (2010). The use of SEM lends support for the conceptual framework while also proving to be statistically robust (Hair et al. 2013; Dash and Paul 2021:2).

Multivariate data analysis techniques, including multiple regression, logistic regression, and analysis of variance, are widely utilised by researchers to experimentally examine hypothesised associations between variables of interest. These statistical procedures form an integral part of the researcher's toolkit. Hair et al. (2021:3) identified three constraints associated with the initial iteration of data analysis tools. Firstly, it is important to note that multiple regression analysis, along with its expansions, assumes a straightforward model structure that includes a single layer of dependent and independent variables. The estimation of causal chains, characterised by the sequential relationship "A leads to B leads to C," or intricate networks involving numerous intervening variables, can only be conducted incrementally using these methodologies, rather than simultaneously. This approach may have significant implications for the accuracy and reliability of the findings (Sarstedt, Hair, Nitzl, Ringle, & Howard, 2020). The second limitation pertains to the constraint that single model approaches are confined to the processing of observable data. The consideration

of theoretical notions, which are intangible and unobservable characteristics or features of a social unit or organisation, necessitates their preliminary confirmation using methods such as confirmatory factor analysis (CFA). The retrospective incorporation of indicators representing theoretical constructs, though, has some limitations. According to Hair et al. (2021:3), One further constraint pertains to the underlying assumption that all variables are measured with utmost precision and accuracy (Haenlein & Kaplan, 2004). The proposition is deemed unfeasible due to the inherent presence of measurement error in every real-world observation, which might manifest as either systematic or random in nature.

In order to address these constraints, scholars have progressively resorted to employing second-generation methodologies. The techniques known as structural equation modelling (SEM) allow researchers to effectively analyse and estimate intricate interactions between various dependent and independent variables. The ideas being examined are commonly not readily visible and are instead assessed through several indications. Structural Equation Modelling (SEM) incorporates the consideration of measurement error in observable variables when estimating relationships. Consequently, the approach yields a more accurate assessment of the abstract constructs under investigation (Cole & Preacher, 2014). The evaluation of the structural model was conducted in accordance with the suggestions put forward by Hair et al. (2018:4) and Hair et al. (2020:104, 106), after the examination of the measurement model.

4.9.1 Measurement Model Evaluation

Measurement models show the relationships between constructs and the factors that are used to assess them (Hair et al., 2018). According to Hair et al. (2020:462), this method enables the assessment of the reliability and precision of all variables. The primary objective is to ensure that the assessment effectively supports the quality of the measurement (Sarstedt, Ringle, & Hair, 2021). It is important to emphasise that the items used to test the constructs are reflective rather than formative of the constructs. This is significant because it influenced the criteria used to assess the measurement and structural models in this study. The evaluation of a reflective measurement model entails analysing the extent to which the variation of each indicator is accounted for by its underlying concept, thereby providing an indication of the reliability of the indicators.

4.9.1.1 Reliability

According to Trochim and Donnelly (2006:88), reliability is the degree to which a survey instrument gives the same results every time it is used, assuming the variable being assessed has not changed. When the variables remain constant and the instrument offers similar results the next time it is used, it is said to be very reliable. Indicator reliability is the square of the indicator loading of a standardised indicator. It shows how much of an item's variation can be accounted by the construct. According to Hair et al. (2021:77), it is recommended to consider indicator loadings that are above the threshold of 0.708. Such loadings indicate that the construct explains more than 50 percent of the variation in the corresponding indicator. Consequently, this leads to the establishment of reliable indicators of credibility. Hair et al. (2021:77) have found a prominent pattern in contemporary social sciences research wherein indicator loadings below the threshold of 0.708, which are considered somewhat weak, are frequently preserved for study rather than being completely discarded. According to a well-accepted principle, it is recommended to exclude indicator loadings that fall within the range of 0.40 to 0.70, provided that their removal does not compromise the validity of the content. The latter refers to the degree to which a measurement effectively encompasses all aspects of a certain concept. However, it is recommended by Hair, Hult, Ringle, and Sarstedt (2022) that indicators with loadings below 0.40, which are especially weak, should be regularly eliminated from the measurement model. After evaluating the loadings of the indicators, the next step entails measuring the internal consistency reliability.

4.9.1.2 Internal Consistency Reliability

Hair et al. (2021) define internal consistency reliability in the context of assessment as the degree to which indicators measuring the same construct exhibit interrelationship. In a similar vein, Mohajan (2017:10) defines reliability as the stability, consistency, and reproducibility of outcomes. When a variable is repeatedly measured under conditions that are nearly identical, a dependable measuring device yields identical results each time (Wright and Wallis, 2019:90). Cronbach's alpha (α) and composite reliability (CR) are frequently used to evaluate the reliability of a construct. The commonly

acknowledged criterion of > 0.70 demonstrates the presence of adequate internal consistency. In this study, both Cronbach's alpha and composite reliability were utilised to evaluate indicators quantifying the internal consistency of constructs.

4.9.1.2.1 Cronbach's alpha

Cronbach's alpha, as described by Hair et al. (2017), assesses the reliability of a measure by examining the intercorrelations between observed items and their corresponding constructs. Given that the items used for construct measurement have been validated in previous research, constructs' Cronbach's alpha should ideally surpass the criterion of 0.708 (Hair et al. 2018:8; Hair et al. 2020:104). According to Sarstedt et al. (2021:17), loadings over 0.708 indicate that the construct explains more than 50% of the variability in an indicator, indicating a good level of item reliability. However, Cronbach's alpha values greater than 0.90 indicate that individual questions assess the same concept, indicating redundancy or duplication, as observed by Hair, Howard, and Nitzl (2020:104). The aforementioned criteria jointly emphasise the importance of utilising Cronbach's alpha as a measure for assessing the internal consistency and dependability of constructs.

4.9.1.2.2 Composite reliability

Composite reliability is a technique for evaluating the reliability of internal consistency that differs from Cronbach's alpha in that it does not presume homogeneous indicator loadings (Hair et al., 2021:183). In contrast to the unweighted nature of Cronbach's alpha, it is believed that composite reliability is weighted, making it a more precise method for measuring construct reliability (Sarstedt et al. 2020:293; Hair et al. 2021:183).

Equivalent to the Cronbach's alpha criterion, the composite reliability must equal or exceed 0.70 to meet the specified reliability standards. Given the use of validated items to measure constructs, composite reliability scores within the range of 0.70 to 0.95 indicate adequate to acceptable reliability (Hair et al. 2022:77; Hair et al. 2017b:112).

To evaluate construct reliability, this study utilised both Cronbach's Alpha and Composite Reliability Coefficients. All composite coefficients of reliability exceeded the recommended threshold of > 0.700 . In addition, the Cronbach's alpha for each

construct was greater than 0.70. Refer to Chapter Five and Tables 5.2, 5.3, 5.4, and 5.5 for comprehensive details.

4.9.2 Validity

Salmons (2019:94) defines validity as the extent to which a study succeeds in measuring the intended values and the degree to which differences discovered reflect the true differences and/or measures among respondents. To achieve the data quality, first, the measures to be employed were validated items used in previous studies and published in high impacts journals. The modified versions of the validated measures were reviewed by the supervisor and pre-tested for clarity, error-free, and unambiguous. Secondly, in order to establish the desired measure, confirmatory factor analysis (CFA) was performed. CFA works best with measurements that have previously been created and verified (Bryne, 2010:97). Thirdly, construct validity was tested to gauge the data quality. Construct validity describes the degree to which a measurement technique accurately represents the target constructs (de Leeuw, Hox, and Dillman: 2008). In SEM, reflective models use convergent and discriminant validity to establish existence of construct validity (Hair, Risher, Sarstedt and Ringle, 2018:12).

4.9.2.1 Convergent validity

Convergent validity evaluates the degree to which a construct coherently aligns with the elucidation of the variance within its indicators. The average variance extracted (AVE) is a statistical measure that quantifies the communality of a construct. It is calculated by taking the mean value of the squared loadings of the indicators connected with the construct, which is obtained by dividing the sum of squared loadings by the number of indicators. Hair et al. (2022) advocate a minimum acceptable average variance extracted (AVE) of 0.50. This implies that an AVE of 0.50 or greater indicates that the construct explains at least 50 percent of the variation in the indicators that make up the construct.

The structural model evaluation required the use of the AVE criteria to examine convergent validity. This criteria assessed the extent to which the latent construct removes variance from its indicators, thereby embodying the essence of the underlying construct as represented by its constituent items.

4.9.2.2 Discriminant validity

The concept of discriminant validity emphasises the degree to which measures of different qualities maintain independence from one another (Cheah et al., 2018). Hair et al. (2021) propose that the measurement of construct distinctiveness within a structural model may be assessed by gauging its empirical separation from other constructs. Historically, the Fornell-Larcker criteria involved comparing the square root of the average variance extracted (AVE), which represents the variation inside a construct, with the inter-construct correlation, which represents the variance between constructs. However, Henseler, Ringle, and Sarstedt (2015) contend that this criteria demonstrates suboptimal performance, especially in cases when there are slight variations in the indicator loadings on a construct (e.g., all indicator loadings ranging from 0.65 to 0.85).

Instead of the aforementioned method, Henseler et al. (2015) propose the use of the heterotrait-monotrait ratio (HTMT) of correlations as a more effective means of evaluating discriminant validity. The HTMT metric assesses the mean correlations between different constructs (known as heterotrait-heteromethod correlations) in comparison to the average correlations between indicators that measure the same construct (known as monotrait-heteromethod correlations). Concerns with discriminant validity occur when the values of the heterotrait-monotrait ratio of correlations (HTMT) are elevated. According to Henseler et al. (2015), a recommended threshold of 0.90 is proposed for models that involve dimensions with a high degree of similarity, such as cognitive satisfaction, emotional satisfaction, and loyalty. In the above cases, if the HTMT value exceeds 0.90, it indicates a deficiency in discriminant validity. However, Henseler et al. (2015) offer a lower criterion of 0.85 for conceptually different entities, suggesting a more cautious approach.

The present study aimed to assess the discriminant validity of constructs inside the structural model by employing the Fornell-Larcker criteria. Convergent validity was successfully established, as shown by the Average Variance Extracted (AVE) of the constructs above the threshold of 0.5. Moreover, the discriminant validity of the study was established, as shown by the Fornell-Larcker criteria being less than 0.90. For a thorough overview, please see Table 4.5, which provides a summary of the quality criteria for reflective measuring models.

Table 4. 5: Quality criteria for reflective measurement models

Quality measures	Types	Threshold	Source
Indicator reliability		greater than 0.708	Sarstedt et al. 2021; Hair et al. 2018.
Internal consistency reliability	Cronbach's alpha (α)	$0.708 \geq 0.90$	Sarstedt et al. 2021; Hair et al. 2020
	Composite reliability	equal to or greater than 0.70.	Hair et al. 2022; Hair et al. 2017b.
Convergent validity		$AVE \geq 0.50$	Sarstedt et al. 2021; Hair et al. 2020.
Discriminant validity	Fornell and Larcker criterion	greater than 0.5	Fornell and Larcker 1981.

4.9.3 Structural Model Evaluation

Following the examination of the measurement model, the structural model was evaluated, which depicts the interconnections between constructs and the statistical significance of these interactions (Sarstedt et al., 2021). The initial stage in this review procedure was to look for any collinearity concerns in the structural model regressions. If collinearity is a problem, it may be necessary to create higher-order constructs or to eliminate one of the highly linked conceptions.

The study then moved on to assess the relevance and importance of the model linkages, notably the path coefficients. The intensity and direction of linkages between variables within a theoretical framework are indicated by path coefficients. They show how changing one variable corresponds with changing another while maintaining all other variables constant. Computing the path coefficients would indicate, for example, if the association between employee engagement and task performance is positive and substantial, or whether the relationship between employee engagement and ICT adoption is positive and significant. The assessment of significance is based on the utilisation of bootstrapping standard errors to calculate t-values of path coefficients or,

alternatively, confidence intervals (Streukens & Leroi-Werelds, 2016). According to Hair et al. (2021:118), path coefficients typically fall between the range of -1 to +1 in terms of their relevance. Values above this range may suggest the presence of potential multicollinearity concerns.

When evaluating structural model results, researchers must evaluate total effects, which comprise the sum of the direct effect, if present, plus all indirect effects linking elements within the model. Investigating total impacts, including their indirect linkages, provides a more full knowledge of the structural model's relationships (Nitzl, Roldán, & Cepeda Carrión, 2016).

The next step in evaluating the structural model consisted of determining the model's explanatory power using the coefficient of determination (R^2). The coefficient of determination, designated by R^2 , quantifies the amount of variation accounted for by the endogenous components within the model and serves as a measure of the model's explanatory power (Shmueli & Koppius, 2011). R^2 denotes the coefficient of determination, a statistical metric that ranges from 0 to 1. A greater R^2 value indicates a greater capacity to explain data variability. After completing the evaluation of model quality, the hypothesis can be tested by determining the statistical significance of the model's relationships and effects using the t-value and p-value.

4.10 Ethical Issues

Ethics concern the responsibility of researchers to be honest and respectful to all individuals who are affected by their research studies or their reports on the studies' report. Thus, ethics are guidelines that assist researchers to make proper decisions and choose proper actions. According to Saunders et al. (2016:239), ethics are the standards of behaviour that govern a researcher's behaviour in relation to the rights of persons who become the subject of their research or are influenced by it. These ethics are seen in two categories: First, the responsibility to ensure the welfare and dignity of the individuals, who participate in research studies. Second, the responsibility to ensure that public reports are accurate and honest. Ethical considerations in this study were consistent with that of Durban University of Technology's Research Ethics Policy and Guidelines. These bother on issues of avoidance of deception, avoidance of harm, informed consent, confidentiality and anonymity, proper storage of data.

4.10.1 Avoidance of deception

Deception occurs when researchers encourage people to take part in a study by deceiving them. For instance, by hiding aspects of research that might find undesirable, by presenting an attractive but false image of the research. In this study, no respondent was deceived to part-take as the purpose for the study was outlined on the letter of consent.

4.10.2 Avoidance of harm

The researcher ensured that the research did not entail any procedure that could cause harm (being physical or mental) to respondents. Avoidance of physical harm entailed avoidance of injury and exclusion of subjects who were susceptible to research treatment. No mental harm (discomfort, anxiety, harassment, invasion of privacy, or demeaning or dehumanizing procedures) was caused to cause from the conduct of the study.

4.10.3 Informed consent

Ethical standards prescribe that respondents should never be coerced to take part in a study; participation should be free, voluntary and fully informed. Thus, respondents should not only know that they are taking part in a study, but also that they give their consent to it - informed consent (i.e. consent is based on correct facts). In order to ensure informed consent, the researcher presented letter of consent (see Appendix B) attached to the questionnaire. On this letter, the intention of the study was stated and respondents were asked to indicate their willingness to part-take in the study by accepting to answer the questions on the questionnaire. No respondent was forced to part-take in the study.

4.10.4 Anonymity and Confidentiality

Anonymity was ensured, no name and contact number of the respondent appeared on the questionnaire. The questionnaire precluded any item that revealed of the technical universities. The biographical information required were sex, age group, range of length of service, and the respondents' status as a managerial employee or not. This information was generic and the outcomes cannot be attributed to any individual. This was saved on the web provider server without respondents' e-mail addresses. Each questionnaire was identified by codes, thus assuring utmost anonymity. It was very difficult for the researcher to link information given by respondents to them. Again, the

researcher ensured confidentiality of the information given by the respondents. The data collected was not made public to any other person for any other purpose other than the purpose for which the data was collected.

4.10.5 Data storage and disposal

To safeguard the raw data, the researcher's Google account, which was password-protected and only available to the researcher, contained a connection to the Google Form. At the conclusion of each survey, the website was shut off. The researcher's laptop was password-protected for the electronically created material. According to Durban University of Technology's requirements, data has to be stored for five years, after which the researcher will permanently remove it from the database.

4.11 Conclusion

This chapter provides an overview of the study methods employed to investigate the impact of supervisor Dark Triad traits and ICT deployment on the association between employee engagement and organisational results. The study employed a quantitative research technique to justify the use of a causal or explanatory research design in order to examine the research hypothesis and address the research issue. The problem was analyzed within the positivist paradigm with justified the objectivist ontology and scientific epistemology which emphasized collection and analysis of data (facts) in the examination of the relationship between employees engagement and organizational outcomes.

The target population was 3003 full-time staff of five (5) technical universities in Ghana. Being guided by the Krejcie and Morgan (1970) sampling table, 341 sample was drawn for the study. The researcher utilised purposive, convenient, and proportionate stratified sampling methodologies to choose the participants. The process of data collecting was the distribution of a questionnaire using an internet platform, namely Google Form, where participants provided their responses. Following the data collection process, the researchers proceeded to analyse the gathered data with Structural equation model (SEM) and SPSS 25. The analysis covered a thorough methodology, using both descriptive and inferential statistical methods to examine the collected data.

Before analysing the data, reliability and validity tests were conducted. Reliability was tested using the Cronbach's Alpha and Composite Reliability Coefficients. Convergent and discriminant validity provided justification for the construct validity of the data. Consistent with the use of partial least squares modeling, both measurement and structural model evaluations were conducted. Ethical issues of avoidance of harm, avoidance of deception, willingness to part-take (informed consent), privacy, anonymity and confidentiality were upheld in this study.

CHAPTER FIVE

DATA ANALYSIS AND PRESENTATION

5.1 Introduction

The main aim of this study was to assess the moderating role of supervisor dark triad qualities and the mediation effect of ICT adoption on the relationship between employee engagement and organisational outcomes (task performance and citizenship performance). The study focused on both academic and non-academic workers in Ghanaian technical universities. This chapter provides an exposition of the findings derived from the inquiry, which are visually represented by means of tables, figures, and textual explanations. The results are presented and discussed in the following order: an overview of the sample composition (respondent characteristics), descriptive statistics relating to the variables, evaluation of the reliability and validity of the measures used, correlation analyses, measurement assessments, hypothesis testing, and comprehensive discussions of the findings.

5.2 Data Screening and Treatment of Missing Data

Prior to evaluation, the survey data were subjected to preliminary analysis, which included coding, entering the data into the Statistical Package for the Social Sciences (SPSS), and verification. This preliminary analysis sought to identify missing data and outliers that could potentially distort the data and the results of subsequent analyses (Coakes and Steed, 2001). In total, there were 341 anticipated responses to the distributed questionnaires. Of these, 288 responses were received, resulting in a response rate of 84%. After initial review, eight questionnaires were excluded due to either missing data or responses that significantly deviated from the expected patterns. These exclusions accounted for 2.7% of the total responses. Upon examination, it was determined that the remaining 280 questionnaires had no missing values and were deemed suitable for further processing and analysis. This preliminary screening phase ensured the integrity of the data by identifying and resolving missing data and outliers

5.2.1 Demographic Analysis

The study collected demographic data based on gender, age, educational background, institution, years of experience and category of staff. The results of the profile of respondents are presented on Figure 5.1 to 5.6 and Table 5.1.

Regarding gender, the data shows that out of the total sample of 280 respondents, 161 are males, constituting 57.5% of the respondents. Also, 119 of the respondents are females, which represents 42.5% of the respondents. Consequently, males constitute most of the respondents. Alternatively, it could mean that males were more inclined to partake in the survey than females. Figure 5.1 shows the details.

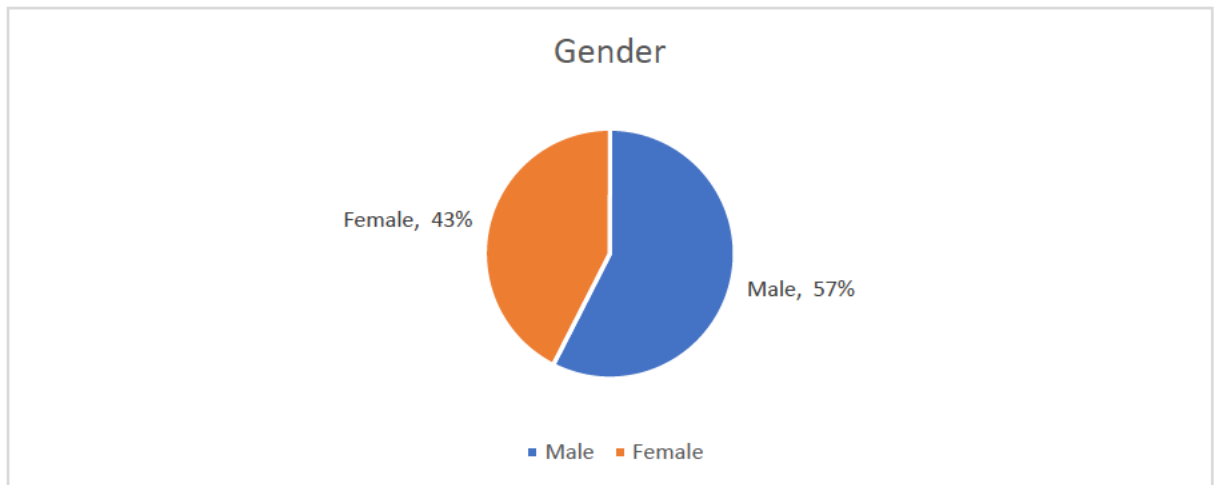


Fig 5.1 Distribution by Gender

Regarding the age category, Figure 5.2 indicate that 32 (12.5%) of the respondents were 21 to 30 years old, while 82 (29.3%) were between 31 and 40 years. Again, 103 (36.8%) of the respondents were aged 41 to 50, and 60 (21.4%) were between 51 and 60 years old. Thus, the data revealed that most of the respondents in this study were aged between 31 and 50 years, representing 66.1%.

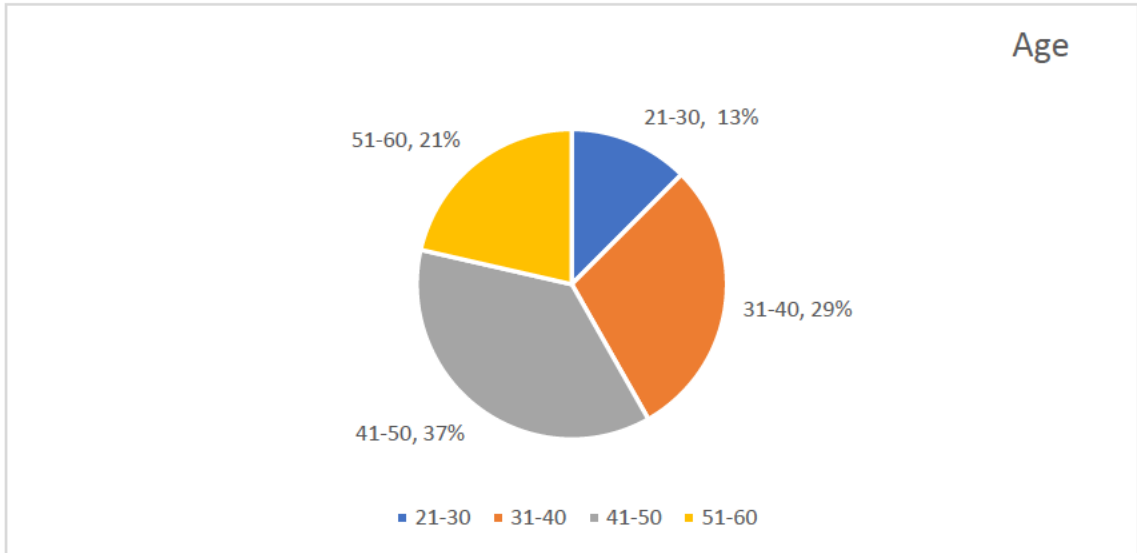


Fig 5.2 Distribution by Age

The survey aimed to determine the respondent's highest degree of education. There are five levels of education: diploma, a bachelor's degree, a master's degree, a doctoral degree, and others. The results in Figure 5.3 revealed that 10 (3.6%) of the respondents had attained a minimum level of had obtained a diploma or Higher National Diploma (HND); while 61 of them, constituting 21.8%, had obtained Bachelor's degrees. The data also shows that 142 of the respondents, representing 50.7%, had obtained master's degrees. Again, 59 respondents, presenting 21.1%, had obtained doctorate degree and nine (9) respondents representing 2.9% had other academic qualifications. Therefore, based on the data, most respondent had obtained a master's degree. It is, therefore, safe to infer that the technical university staff in Ghana relies on employees with master degree.

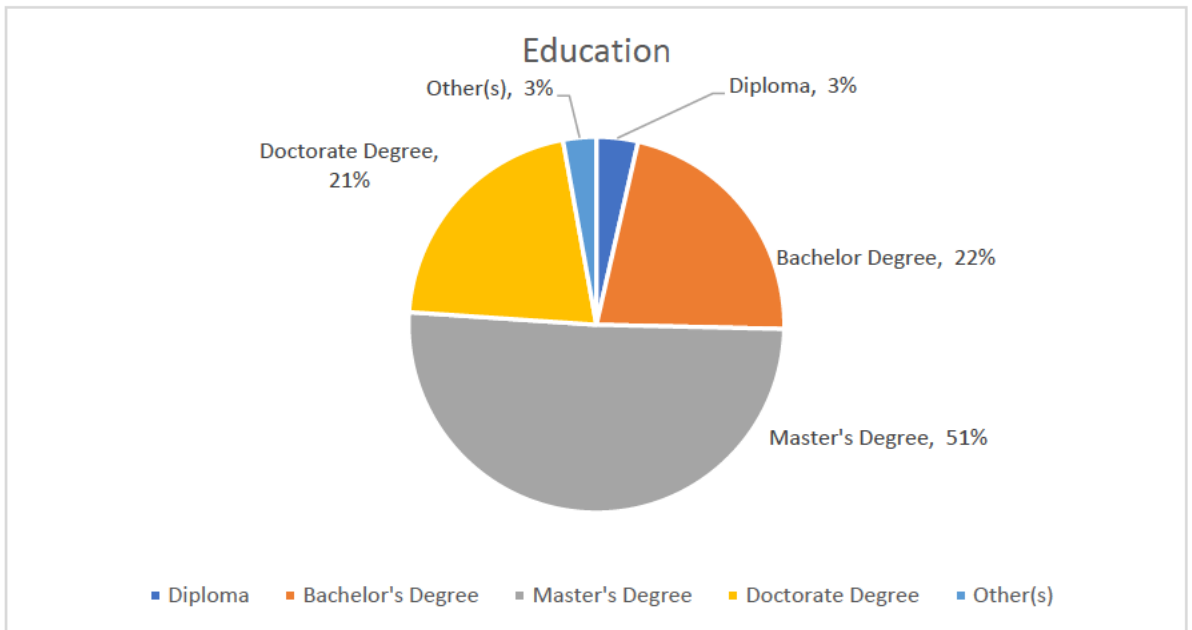


Fig 5.3 Distribution by level of Education

Among the various Technical institutions where the study was conducted, the findings showed that 'University W' had the fewest respondents, totaling 21 participants, which accounted for 7.5% of the total sample. 'University V' had a higher number of respondents, with 59 participants, representing 21.1%. The result further revealed that 'University Z' had 22 responses representing 7.9% while 'University Y' had 40 representing 14.3%. Interestingly, 'University X' stood out with the largest number of respondents, totaling 138 participants, and making up a significant portion of 49.3% of the total sample. It is important to note that 'University X' had the highest level of engagement with the study, while 'University W' had the lowest. The details is presented in figure 5.4.

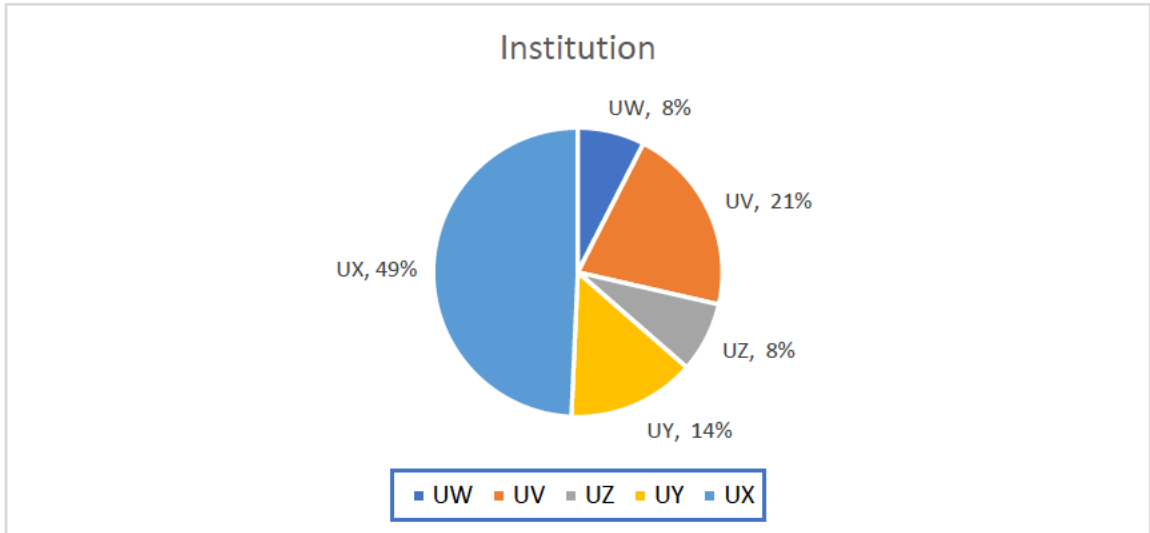


Fig 5.4 Fig 5.1 Distribution by Technical Universities

In response to employment tenure, 97 (34.6%) had worked at their universities for 1-to-5 years, followed by 55 (19.6%) who had worked for 6-to-10 years; 85 (30.4%) had worked at their firms for 11-to-15 years; 27 (9,6%) had worked for their firms for 16 to 20 years and 16 respondents (5.7%) had worked for 21years and more. The data revealed that the bulk of these respondents had worked for one to fifteen years, with a handful having worked for more than twenty years. Figure 5.5 shows the details.

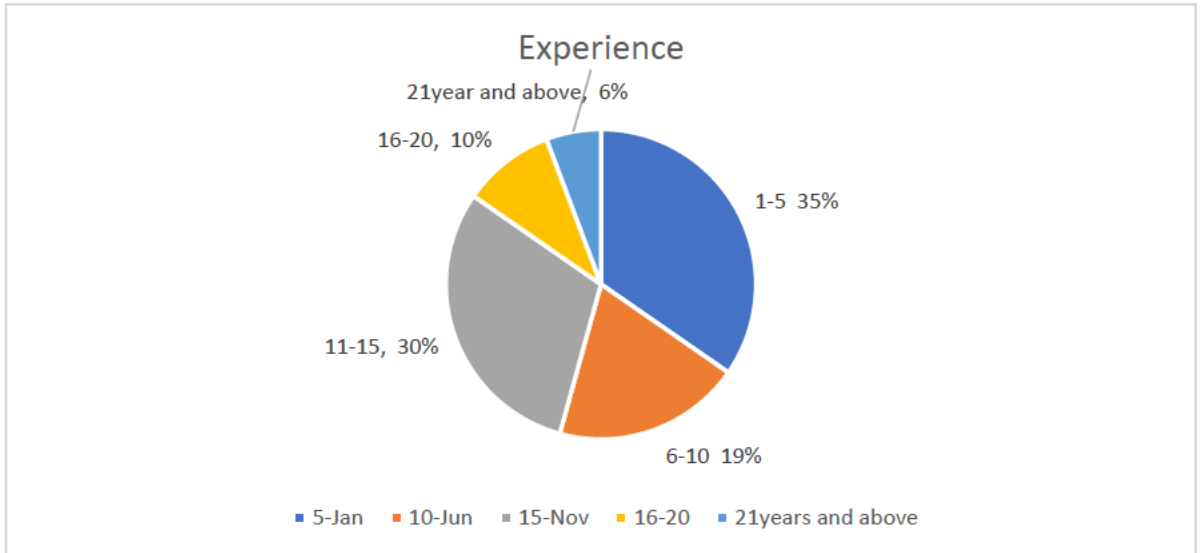


Fig 5.5 Distribution by Number of Years of Service

As regards category of staff, 159 of the respondents representing 56.8% were teaching staff and 121 representing 43.2% were non-teaching staff. This is shown in Figure 5.6.

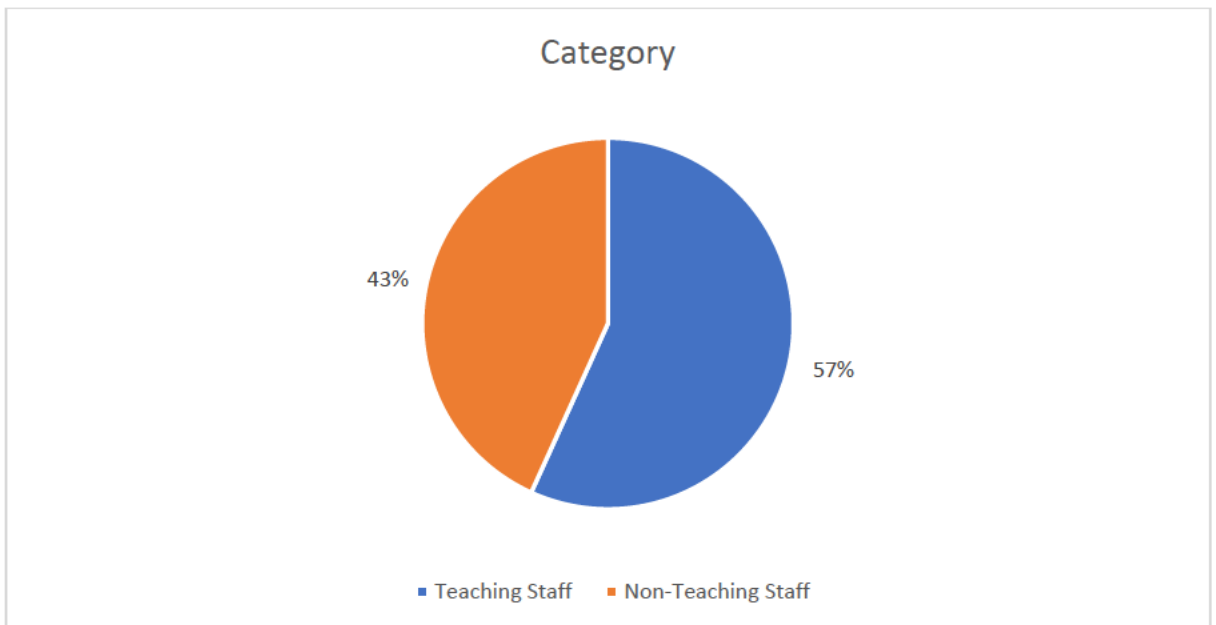


Fig 5.6 Distribution by Category of Staff

Table 5.1: Summary of Sample composition (N=280)

Variable		Frequency	Percentage %
Gender	Male	161	57.5%
	Female	119	42.5%
Age	21-30	35	12.5%
	31-40	82	29.3%
	41-50	103	36.8%
	51-60	60	21.4%
Education	Diploma	10	3.6%
	Bachelor's Degree	61	21.8%
	Master's Degree	142	50.7%
	Doctorate Degree	59	21.1%
	Other(s)	8	2.9%
Institution	UV	59	21.1%
	UW	21	7.5%
	UX	138	49.3%
	UY	40	14.3%
	UZ	22	7.9%
Experience	1-5	97	34.6%
	6-10	55	19.6%
	11-15	85	30.4%
	16-20	27	9.6%
	21years and above	16	5.7%
Category	Teaching Staff	159	56.8%
	Non-Teaching Staff	121	43.2%

5.2.2 Measurement evaluation

For scale validation, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were performed on the constructs of the study. Using SPSS version 25, the principal component analysis was conducted and factors with Eigen values greater than

one (1) were maintained and moved to the next stage (refer to Appendix A-1a). In all, six components were generated and that accounted for 75.4% of the total variance explained. Amos version 24 was used to conduct the CFA. Due to low standardized loadings and high cross-loadings, one item was removed from Behavioral engagement, and certain error terms were covaried to improve the fit indices, resulting in a measurement model with 46 items.

5.2.2.1 Reliability and Validity of Measures

The examination of the data's reliability and validity was carried out. In order to assess the reliability of the measurements, this study utilised composite reliability and Cronbach's alpha. The formula proposed by Fornell and Larcker (1981) was utilised to compute the composite reliability for each latent variable. The loadings of the item-to-construct can be utilised for the purpose of analysing the reliability of individual items. According to Bagozzi and Yi (2012) and Hair et al. (2012), a factor loading equal to or greater than 0.70 indicates that the latent construct explains at least 50% of the variability in the item. Conversely, it is advisable to avoid factor loadings below 0.5. All composite reliabilities were more than 0.90 (see Tables 5.2, 5.3, 5.4, 5.5), indicating that the scales for each construct were reliable. Also, Cronbach's alphas were all greater than 0.91.

As regards validity, by precisely defining and operationalizing terms, content validity was sought. The majority of the measuring items came from existing literature and had been verified in previous investigations. CFA outcomes indicate acceptable convergent and discriminant validity. Convergent validity was attained since all standardized factor loadings were significant and exceeded the minimally acceptable threshold of 0.5. Discriminant validity was used to determine the degree to which the constructs differed and to demonstrate a construct's independence of measurement model from redundant items. To be more specific, if the items in a construct were more strongly linked than those measuring other constructs, the measure was said to have discriminant validity.

Babin and Zikmund (2016) argue that a measure (items assessing a construct) should not be extensively correlated with another construct's measure. According to Fornell and Lacker (1981), the square root of the AVE should be larger than the correlation between the construct and the other constructs. The AVE for each construct in the study was more than the squared correlation with the other constructs, indicating that all of

the constructs in the study satisfied the discriminant validity criteria (Gaskin, James, & Lim, 2019) (see Table 5.7).

Table 5.2: Employee Engagement Constructs, Measurement Items and Reliability and Validity Tests

Variable	Loadings(t-values)
<i>Employee Engagement: second order; $\alpha=.973$; CR=.986; AVE=.849</i>	
<i>Cognitive Engagement: first-order factor; $\alpha=.909$; CR=.920; AVE=.700</i>	
CE 1: I am focused on my job when I am working.	.787(14.99)
CE2: I concentrate on my job when I am at work.	.596(10.62)
CE3: When working, I think a lot about how I can give my best.	.872(17.27)
CE4: At work, I am focused on my job.	.893(17.88)
CE5: When I am at work, I give my job a lot of attention.	.936(fixed)
<i>Emotional Engagement: first-order factor; $\alpha=.943$; CR=.943; AVE=.768</i>	
EE1: Working at my current institution has a great deal of personal meaning to me.	.905(18.25)
EE2: I feel a strong sense of belonging to my job	.888(17.73)
EE3: I am proud to tell others that I work for my current institution.	.873(21.70)
EE4: I believe in the mission and purpose of my institution.	.792(fixed)
EE5: I care about the future of my institution.	.860(16.94)
<i>Behavioural Engagement: first order: $\alpha=.957$; CR=.953; AVE=.836</i>	
BE1: I do more than is expected of me.	.857(16.85)
BE3: I am willing to put in extra effort without being asked.	.912(18.45)
BE4: I often go above and beyond what is expected of me to help my team be successful.	.863(17.02)
BE5 work harder than expected to help my Institution succeed.	.883(fixed)

Table 5.2 provides information about employee engagement, a second-order construct that consists of dimensions of cognitive engagement, emotional engagement, and behavioural engagement. It also shows their reliability and validity. Employee engagement demonstrated strong convergent validity with a high alpha (α) of 0.973 and composite reliability (CR) of 0.986. The average variance extracted (AVE) was 0.849, indicating good reliability and validity. Cognitive engagement is a first-order factor with an alpha reliability coefficient of 0.909, composite reliability of 0.920, and AVE of 0.700. The loadings of the cognitive engagement component contained five measurement items, all of which had significant loadings on the construct ranging from 0.596 to 0.936. Emotional engagement is another first-order component, with $\alpha = 0.943$, $CR = 0.943$, and $AVE = 0.768$. It is measured by five assessment items with loadings ranging from 0.792 to 0.905. Loadings for the four measuring items for behavioural engagement also a first-order factor ranged from 0.857 to 0.912, demonstrating an alpha reliability coefficient of 0.957, a composite reliability of 0.953, and an average variance extracted (AVE) of 0.836. The CE5 factor loading is fixed at 0.936, the EE4 factor loading is fixed at 0.792, and the BE5 factor loading is fixed at 0.883, indicating that the measurement items CE5, EE4, and BE5 and their respective latent factors are predetermined and cannot vary during the analysis. The loadings demonstrate that the items are suitable and meet the criteria for measuring employee engagement within the technical universities of Ghana.

Table 5.3 shows the "second order" construct of organisational outcomes with an alpha reliability coefficient of 0.916, a composite reliability of 0.986, and an average variance extracted (AVE) of 0.849. It represents an overarching concept that encompasses two first-order factors: Task Performance and Citizenship Performance. Task Performance is a "first order" factor with an alpha reliability coefficient of 0.972, a composite reliability of 0.969, and an average variance extracted (AVE) of 0.862. It is directly measured by five indicators (measurement items). The item with the lowest load had 0.915, and the item with the highest load had 0.929. This means that the five items meet the quality criteria and are adequate to measure the task performance of employees in the technical universities in Ghana. Citizenship Performance is another "first order" factor with an alpha reliability coefficient of 0.983, a composite reliability of 0.983, and an average variance extracted (AVE) of 0.876. It is directly measured by eight indicators (measurement items). The item with the lowest load score (0.914, t-value

29.35), and the item with the highest load score (0.959, t-value 36.66). This means that the eight items meet the quality criteria and are reliable for measuring the citizenship accomplishments of workers within the technical universities in Ghana. The factor loading of TP5 is fixed at 0.921 and that of CP4 is fixed at 0.947, indicating that the measurement item is assumed to have a constant and known relationship with the latent factor. Both Task Performance and Citizenship Performance are measured by their respective indicators, and the factor loadings indicate the strength of the relationship between the latent constructs and their indicators.

Table 5.3: Organisational Outcomes Constructs, Measurement Items and Reliability and Validity Tests

<i>Variable</i>	Loadings(t-values)
<i>Organisational Outcomes: second order; $\alpha=.916$; CR=.986 ; AVE=.849</i>	
<i>Task performance; first order factor; $\alpha=.972$; CR=.969; AVE=.862</i>	
TP1: My performance meets job objectives well.	.929(27.98)
TP2: I am happy with my overall job performance.	.951(31.82)
TP3: I meet performance standards to organisational level expectations.	.927(27.47)
TP4: I am happy with my technical competence and handle the task with proficiency.	.915(27.05)
TP5: I always plan and organise to achieve the objectives of the job and meet deadlines.	.921(fixed)
<i>Citizenship Performance, first order factor: $\alpha=.983$; CR=.983; AVE=.876</i>	
CP1: At work, I do things to help others when it's not part of my job.	.914(29.350)
CP2: I willingly help new staff get oriented towards the job. I work for the overall good of the technical university.	.939(31.28)
CP3: I don't take extra or long breaks while on duty.	.959(36.66)
CP4: My attendance at work is more often than usual, for example, I take fewer days off than my colleagues or fewer than is authorized.	.947(fixed)
CP5: I keep myself updated with the university's announcements and memos.	.959(35.88)
CP6: I always keep myself abreast of changes in the university.	.934(31.88)
CP7: I usually find fault with what the university is doing.	.915(29.02)
CP8: I always require a boost of motivation to get the work done.	.927(17.58)

Supervisor Dark Triad Traits, a second-order construct, was rated with 12 items based on the dimensions of Machiavellianism, Psychopathy, and Narcissism. It demonstrated good internal consistency with $\alpha = 0.943$ and $CR = 0.942$, but a relatively lower AVE of 0.576. Table 5.4 presents the items that measured SDT. Machiavellianism, a first-order factor with four measurement items, all showing significant loadings ranging from 0.723 (minimum) to 0.843 (maximum), demonstrated good internal consistency with $\alpha = 0.879$; $CR = 0.880$; $AVE = 0.648$. Another first-order factor is psychopathy, with an alpha reliability coefficient of 0.898, a composite reliability of 0.899, and an average variance extracted (AVE) of 0.689. The indicators comprise four measurement items, with loadings ranging from 0.818 to 0.843. Additionally, loadings for the four measuring items for narcissism, a first-order factor, ranged from a minimum of 0.778 to a maximum of 0.906, and they demonstrated a good internal consistency of $\alpha = 0.895$; $CR = 0.900$; $AVE = 0.692$. The factor loading of Mac4 is fixed at 0.843, that of Psy4 is fixed at 0.833, and that of Nas4 is fixed at 0.822, indicating that the measurement items Mac4, Psy4, and Nas4 and their respective latent factors are predetermined and not allowed to vary during the analysis. The loadings of all 12 measurement items imply that the items are reliable and adequate to measure the dark triad trait of supervisors in the technical universities in Ghana.

Table 5.4: Supervisor Dark Triad Trait Constructs, Measurement Items and Reliability and Validity Tests

<i>Variable</i>	Loadings(t-values)
<i>Supervisor Dark Triad Trait; second order; $\alpha=.943$; CR=0.942; AVE=.576</i>	
<i>Machiavellianism; first-order factor; $\alpha=.879$; CR=.880; AVE=.648</i>	
Mac1: My supervisor tends to manipulate me to get his/her way.	.723(13.55)
Mac2: My supervisor uses deceit or lies to get his/her way.	.807(15.84)
Mac3: My superior uses flattery (sweet talk) to get what he/she wants.	.841(16.82)
Mac4: My supervisor tends to exploit others towards his/her end.	.843(fixed)
<i>Psychopathy; first order; $\alpha=.898$; CR=.899; AVE=.689</i>	
Psy1: My supervisor tends to lack remorse.	.827(16.44)
Psy2: My supervisor tends to be unconcerned with the morality of my actions.	.818(16.18)
Psy3: My supervisor tends to be callous or insensitive.	.843(16.93)
Psy4: My superior tends to be <i>distrustful</i> .	.833(fixed)
<i>Narcissism: first-order factor; $\alpha=.895$; CR=.900; AVE=.692</i>	
Nas1: My supervisor tends to want others to admire him/her.	.817(15.94)
Nas2: My supervisor tends to want others to pay attention to him/her.	.778(14.87)
Nas3: My supervisor tends to seek prestige or status.	.906(18.49)
Nas4: My supervisor tends to expect special favours from others.	.822(fixed)

Table 5.5: ICT Adoption Constructs, Measurement Items and Reliability and Validity Tests

Variable	Loadings(t-values)
ICT Adoption; $\alpha=.916$; $CR=.909$; $AVE=.588$	
ICT1: In delivery services, I am willing to allow students and other clients to locate and send information electronically to appropriate contacts within the university.	.749(11.29)
ICT2: I am willing to offer solutions to students' and other clients' problems and allow them to track and inquire about their requests electronically.	.764(11.49)
ICT3: I am willing to accept electronic payments, messages, and inquiries from students and clients.	.842(12.49)
ICT4: I am willing to provide online information to students and other clients.	.850(12.58)
ICT5: I am willing to respond to students' questions and requests for information electronically.	.749(11.29)
ICT6: I am willing to provide regular updates to students and other clients about our services electronically.	.721(10.9)
ICT7: I am willing to provide clients with general information about the university via email, websites, WhatsApp etc.	.678(fixed)

Table 5.5 provides information about the ICT adoption construct and its reliability and validity measures. ICT adoption, a separate construct, had seven measurement items, and it demonstrated good internal consistency with $\alpha = 0.916$ and $CR = 0.909$, but a lower AVE of 0.588. The item with the lowest load had 0.678, and the item with the highest load had 0.850. This means that the seven items meet the quality criteria and are adequate to measure the ICT adoption of employees in the technical universities in Ghana.

Following the determination of strong reliability coefficient, model fit and validity measures were computed.

5.2.3 Assessment of Model Fit

Bagozzi and Yi (2012), maintain that model fit evaluation involves two key criteria: *absolute* and *comparative* fit. The *absolute* fit includes common indicators such as chi-square (2), root-mean-square-error of approximation (RMSEA), root-mean-square-residual (RMSR), standardized root-mean-squared residual (SRMSR), goodness-of-fit-index (GFI), and adjusted goodness-of-fit index (AGFI), and its evaluation is based on differences between the observed and covariance matrix (Hair et al., 2014). Comparative fit, on the other hand, considers if the chosen model is superior to other alternative models when accounting for the observed data. Some of the criteria utilized in the comparative fit include the comparative fit index (CFI), the normed fit index (NFI), and the relative non-centrality index (RNI) (Hair et al., 2014). In determining the fitness of a model, researchers (for example, Byrne, 1989; Bentler, 1990; Chau, 1997; Hair et al., 2012) assert that these fit indices have recommended thresholds to meet to be accepted: RMSEA 0.08, Goodness-of-Fit-Index (GFI 0.90), Normed Fit Index (NFI 0.90), Tucker-Lewis Index (TLI.90), and Comparative Fit Index (CFI 0.90). The question of “what is a good RMSEA value” is debated (Hair et al. 2006, p. 748). However, for the majority of models, values less than 0.10 are appropriate. Other researchers have suggested that the RMSEA should be less than 0.08, and the SRMR should be less than 0.07. Furthermore, a chi-square value to the degree of freedom ratio less than 3.0 shows a reasonable fit, and less than 2.0 is a good fit (Papke-Shields et al., 2002). It is noteworthy that while the RMSEA is an absolute fit index that examines the difference between a hypothesised model and a perfect model, the CFI and TLI are incremental fit indices that compare the fit of a hypothesized model with that of a baseline model or a model with the worst fit (Xia and Yang, 2019). Thus, when these conditions are met, considerable convergent validity is achieved (Hair et al., 2012; Babin and Zikmund, 2016).

According to LaPlaca, Lindgreen, and Vanhamme (2018), analyses should be evaluated for robustness. For example, rather than running the model on the full sample, one could examine the sample for heterogeneity (through latent class analysis, split-half comparisons, or multi-group analysis, especially if there are hypotheses about the causes of heterogeneity). The study adopted split-half comparisons by parcelling the study variables to assess their fitness via latent class analysis and compared the results

with the model of the full sample. The study utilised the AMOS plugin created by Gaskin and Lim (2017) to construct the tables containing model validation measures and model fit indices. The validity metrics and model fit indices are summarised in Tables 5.6.

Table 5.6: Model fit measures and recommended threshold

Measure	Estimate	Threshold	Interpretation
X2	2246.72	----	----
Df	944	----	----
X2/DF	2.38	Between 1 and 3	acceptable fit
P	.000	*=p<.05; **=p<.01; ***=p<.001	Significant
RMSEA	.070	<0.08	acceptable fit
CFI	.921	>0.90	reasonable fit
SRMR	.0478	<0.07	acceptable fit
TLI	.913	0.90	reasonable fit

Table 5.6 shows the model fit measures and indicate how well the proposed model fits the observed data. Chi-square/df ratio (X2/DF) evaluates the goodness of fit relative to the degrees of freedom. Generally, a value close to 2 indicates a reasonable fit. In this case, the value of 2.38 suggests that the model has an acceptable fit. RMSEA assesses how well the model fits the population covariance matrix. A value below 0.08 is considered a reasonable fit, and in this case, the RMSEA = 0.070 suggests an acceptable fit. From the table a value closer to 1 indicates a better fit of comparative fixed index therefore the CFI value of 0.921 suggests a reasonable fit of the model. As regards Standardized Root Mean Squared Residual (SRMR), a value below 0.08 is considered a good fit, and in this case, the SRMR of 0.0478 suggests an acceptable fit. Tucker-Lewis Index (TLI) is another index that compares the proposed model with the null model. A value closer to 1 indicates a better fit. The TLI value of 0.913 suggests a reasonable fit of the model. The model fit indices indicate that the proposed model has an acceptable fit to the observed data.

Table 5.7: Model fit Indices

Variable	(X ²)	DF	X ² /DF	P	RMSEA	CFI	SRMR	TLI
Value								
Model 1	2423.50	964	2.51	.000	.099	.912	.0319	.905
Model 2	2246.72	944	2.38	.000	.070	.921	.0478	.913

Note: X²=Chi-square; DF=Degree of Freedom; RMSEA=Root Mean Square Error of Approximation; CFI=Comparative Fit Index; SRMR=Standardized Root Mean Residual TLI=Tucker-Lewis Index. Model 1=second-order factor; Model 2=first-order factor

Table 5.7 shows the model fit indices for two different models (Model 1 and Model 2) that were calculated using the CFA purification procedure. These fit indices are commonly used to assess how well the models fit the observed data. All the model fit indices for the main constructs were appropriate and within the endorsed range, indicating that strong convergent validity was achieved. However, the lower the values for certain indices, the better the model fits the data. Among the fit indices, Model 2 shows a slightly better fit compared to Model 1. Model 2 has lower values for RMSEA = 0.070 (indicating better fit), higher values for CFI = 0.921 and TLI = 0.913 (both above .90, indicating acceptable fit), and a marginally higher value for SRMR = .0478 (indicating acceptable fit). Overall, Model 2 appears to have a better fit with the data compared to Model 1. From Table 5.7, model 2 was selected for the final analysis. This model contained all the computed first-order factors loading on their corresponding latent constructs and it provided a good fit ($\chi^2=2246.72$, $df=944$, $\chi^2/df=2.38$, $p=.000$, $RMSEA=0.70$, $CFI=0.92$, $TLI=0.91$).

Table 5.8a below displays the findings of the discriminant validity analysis, which evaluates the distinctness of the study's latent variables. Typically, the correlation between latent variables is examined and compared to the square root of the Average Variance Extracted (AVE) for each variable. The Composite Reliability (CR), Average Variance Extracted (AVE), Maximum Shared Variance (MSV), and square root of

AVE (MaxR) for each variable are reported in this study. The diagonal elements ranging from minimum of 0.767 to maximum of 0.936 reflect the square root of AVE, which demonstrates the relationship between each latent variable and its associated indicators. The results show that the square root of AVE for each latent variable is greater than its correlation with other variables, indicating that discriminant validity is confirmed. This suggests that each latent variable is different from the others and has little variance with them.

Table 5.8b presents the validity analysis of second-order factors in the study. The analysis includes several validity measures, including Composite Reliability (CR), Average Variance Extracted (AVE), Maximum Shared Variance (MSV), and the square root of AVE (MaxR (H)). Organisational Outcomes has high reliability (CR = 0.986) and average variance extracted (AVE = 0.849), showing good internal consistency and convergent validity. Employee Engagement (Engage) has a high dependability (CR = 0.974) and a modest AVE (0.731). It is substantially associated with Organisational Outcomes, indicating convergent validity. Additionally, Leader Dark Triad (LDT) has acceptable dependability (CR = 0.942) but a poor AVE (0.576). It is not strongly linked with Organisational Outcomes or Employee Engagement, demonstrating a lack of convergent validity. Finally, ICT Adoption shows acceptable reliability (CR = 0.907) and AVE (0.583). It is significantly associated with Organisational Outcomes and Employee Engagement, indicating convergent validity. The findings therefore support the validity of the second-order constructs in the study.

5.2.4 Descriptive Statistics and Correlation Matrix

Descriptive statistics and the correlation matrix for all constructs are presented in *Table 5.9*. Consistent with prior literature, Employee engagement and organizational outcomes are measured as second-order factors with three and two first-order factors respectively. Correlation is employed to evaluate the magnitude of the linear association between a study's continuous variables. A low to moderate correlation between variables is appropriate for determining their distinct contributions to the overall model. There is a risk of multicollinearity if a variable explains up to 0.9 of the outcome variable. The association between the study's variables was minor, and they were suitable for future investigation. The first-order factors of LDT (Mac, Psycho, and Nas) were highly correlated because they measure the same construct. The

remaining variables correlated moderately. Thus, multicollinearity was not a concern in this regard.

Table 5.9 presents the correlation matrix and descriptive statistics for the variables in the study. The variables included are Age, Experience, ICT Adoption, Organisational Outcomes, Employee Engagement, Narcissism, Machiavellianism, and Psychopathy. The mean and standard deviation of each variable represent the descriptive statistics. Age and Experience have a positive correlation of 0.644**, indicating that older participants tend to have more work experience; ICT Adoption is not significantly correlated with any other variable (correlations are close to zero); ICT Adoption has positive and significant correlations with Organisational Outcomes (0.593**) and Employee Engagement (0.606**), suggesting that higher ICT Adoption is associated with better organisational outcomes and higher employee engagement. Again, Organisational Outcomes and Employee Engagement have a strong positive correlation of 0.822**, indicating that higher levels of employee engagement are associated with better organisational outcomes. Narcissism has weak correlations with other variables, with the highest correlation being 0.087 with Machiavellianism. Finally, Machiavellianism and Psychopathy have positive and strong correlations of 0.838** and 0.882**, respectively, indicating a significant relationship between these dark triad traits.

Table 5.8a: Discriminant validity

	CR	AVE	MSV	MaxR (H)	Cperf	Egag	Psyco	ITadoption	Nas	Mac	Tperf
Cperf	0.983	0.876	0.914	0.984	0.936						
Egag	0.974	0.731	0.638	0.979	0.799***	0.855					
Psyco	0.899	0.689	0.684	0.899	0.031	0.028	0.830				
ITadoption	0.908	0.588	0.333	0.916	0.551***	0.574***	0.037	0.767			
Nas	0.900	0.692	0.684	0.910	0.086	0.079	0.827***	0.061	0.832		
Mac	0.880	0.648	0.678	0.887	0.032	-0.018	0.823***	0.010	0.777***	0.805	
Tperf	0.969	0.862	0.914	0.970	0.956***	0.798***	0.025	0.577***	0.075	0.040	0.929

The AVE measures are displayed diagonally.

Table 5.8b: Validity Analysis of Second-order Factors

	CR	AVE	MSV	MaxR(H)	Orgout	Engage	LDT	ITadopt
Orgout	0.986	0.849	0.650	0.988	0.921			
Engage	0.974	0.731	0.650	0.979	0.806***	0.855		
LDT	0.942	0.576	0.002	0.945	0.048	0.036	0.759	
ITadopt	0.907	0.583	0.340	0.911	0.574***	0.583***	0.038	0.764

No validity concerns here: Orgout=Organizational outcomes; Engage=Employee engagement; ITadopt=IT adoption; Psycho=Psychopathy, Mac=Machiavenialism; Nas=Nascism; LDT=Supervisor dark triad traits

Table 5.9: Correlation Analysis and Descriptive Statistics

Variables	Mean	SD	1	2	3	4	5	6	7	8
1. Age	2.69	.990								
2. Experience	9.53	6.514	.644**	1						
3. ITadoption	1.6873	1.1113	.012	-.024	1					
4. Orgout	1.9365	.94703	.010	.013	.593**	1				
5. Engage	1.7899	.61897	.032	.003	.606**	.822**	1			
6. Nas	3.7611	.82763	-.023	.002	.066	.087	.083	1		
7. Mac	2.6713	.81418	-.045	.062	.011	.034	-.018	.838**	1	
8. Psyco	1.4428	.84627	-.048	.052	.040	.031	.030	.882**	.884**	1

N=280. **p< 0.01, *p<.05 level (2-tailed).

5.2.4 Structural Model Analysis

A Structural Equation Model (SEM) was used in the study's main analysis. Following the establishment of data model fit (including validity, reliability, and model fit indices), the structural model is evaluated (Kline, 2015). Structural models describe the links between latent constructs that impact the values of other latent constructs within the model, either directly or indirectly (Byrne, 2013). The evaluation of the structural model in this study attempted to test the theoretical assertions generated from the conceptual framework. The structural model's relevance was established by assessing characteristics such as regression weight strength, t-values, p-values for t-statistics significance, and effect sizes of independent variables on dependent variables (Hair et al., 2014). The evaluation included a look at both direct and total impacts among factors, as well as indirect and interaction effects.

5.2.4.1 Control variables

The study controls for factors that potentially confound the relationships of interest to remove undesired variation. The first control variable is the age of the respondents. Age can influence the adoption and usage of ICT, and could potentially affect the organisational outcomes. In this light, the younger generation is likely to adopt ICT easily to influence business outcomes as compared to the older generation. Secondly, gender was also controlled because males and females are touted to vary in this regard. The last control variable was the years of experience. The years of work experience can influence the level of employees' engagement, and supervisor relationship.

5.3 Results of the Direct Effects

The hypothesized relationships were assessed following the main objectives and the model of the study. The initial consideration was the R^2 value of the endogenous variables and the path coefficient. The R^2 value of the model was .70. This indicates that the predictor variables account for 70% variance in the outcome variable and as a result, the model is fit for assessment. The propositions made were that:

H1a: Employee engagement has a significant positive influence on Organisational outcomes.

This hypothesis sought to assess the influence employee engagement has on organisational outcomes in technical universities in Ghana. The structural model

presented in Table 5.10 demonstrates that employee engagement ($\beta = .774$, $t = 17.668$, $p \leq .001$) significantly predicted organisational outcomes. This implies that organisational outcomes, particularly in terms of task performance and citizenship performance, grow in parallel with rising employee engagement levels. Therefore, Hypothesis 1a is supported by the research's findings.

H1b: Employee engagement has a significant positive influence on task performance.

The objective of this second hypothesis was to assess the degree to which employee engagement serves as a predictor of task performance within technical universities in Ghana. The entire structural model, as depicted in Table 5.10, provides evidence that employee engagement ($\beta = .694$, $t = 17.432$, $p \leq .001$) is a strong predictor of task performance. This signifies that as employee engagement levels rise, there is a corresponding increase in the quality of task performance. Therefore, the data validate Hypothesis 1b.

H1c: Employee engagement has a significant positive influence on citizenship performance.

This third hypothesis aimed to evaluate the degree to which employee engagement predicts citizenship performance in technical universities in Ghana. The general structural model as seen in Table 5.10 shows that employee engagement ($\beta = .772$, $t = 17.243$, $p \leq .001$) significantly anticipated citizenship performance. This indicates that as employee engagement levels increase, there is a respective corresponding increase in citizenship performance of employee. Hypothesis 1c was confirmed by the data.

H2: Employee engagement has a positive significant impact on ICT adoption.

This hypothesis intended to evaluate the influence of employee engagement on the adoption of information and technology at technical universities in Ghana. The findings from Table 5.10 indicate that there is a substantial relationship between employee engagement and the adoption of information and communication technology ($\beta = .516$, $t = 12.650$, $p \leq .001$). The regression analysis reveals that employee engagement has a positive and statistically significant effect on the usage of ICT by employees. Specifically, as employee engagement improves, there is a commensurate increase in the extent to which employees utilise ICT. Hypothesis 2 was also endorsed.

H3a: ICT adoption has a positive significant impact on Organisational Outcomes.

This hypothesis attempts to establish a statistical link between Information and Communication Technology (ICT) adoption and the outcomes of an organisation. The findings from the structural model presented in Table 5.10 indicate a significant relationship between the adoption of information and communication technology ($\beta = .183$, $t = 3.593$, $p \leq .000$) and organisational outcomes. Specifically, the results suggest that as employees increase their usage of information and communication technology, there is a corresponding increase in organisational outcomes. The evidence validated Hypothesis 3a.

H3b: ICT adoption has a positive significant impact on task performance.

This hypothesis aims to quantitatively establish the association between ICT adoption and organisational results. The structural model as depicted in Table 5.10 demonstrates that information and communication adoption ($\beta = .201$, $t = 4.344$, $p \leq .000$) significantly predicted employee task performance such that as employee increases the usage of information and communication technology, there is a respective corresponding increase in task performance of employees. Hypothesis 3b was confirmed by the study.

H3c: ICT adoption has a positive significant impact on citizenship performance.

Hypothesis 3c sought to statistically ascertain the relationship between ICT adoption and citizenship performance. The results presented in Table 5.10 demonstrate that the structural model provides support for the significant influence of information and communication adoption ($\beta = .177$, $t = 3.216$, $p \leq .001$) on citizenship performance such that as employees increase their usage of information and communication technology, there is a corresponding increase in their citizenship performance. Hypothesis 3c was confirmed by the study.

H4a: Supervisor dark triad trait negatively and substantially influence Organisational outcomes.

The purpose of this hypothesis was to establish a statistical relationship between Supervisor Dark Triad (SDT) characteristics and organisational outcomes. The comprehensive structural model presented in Table 5.10 indicates that the supervisor dark triad ($\beta = .020$, $t = .563$, $p = .574$) did not predict organisational outcomes significantly. This result suggests that SDT attributes may not have a significant effect on organisational outcomes. The findings therefore do not support Hypothesis 4a.

H4b: Supervisor Machiavellianism negatively and significantly influence task performance.

The aim of this hypothesis was to utilise statistical analysis to investigate the potential relationship between supervisor Machiavellianism and task performance. The structural model depicted in Table 5.10 illustrates a significant and positive correlation between supervisor Machiavellianism and task performance ($\beta = .201$, $t = 3.383$, $p \leq .05$), which contradicts the initial hypothesis proposing a negative relationship. The investigation's findings did not provide support for Hypothesis 4b.

H4c: Supervisor Machiavellianism negatively and significantly influences citizenship performance.

This hypothesis attempts to establish a statistical link between supervisor Machiavellianism and citizenship performance. Table 5.10 demonstrates that supervisor Machiavellianism ($\beta = .258$, $t = 3.382$, $p < .05$) substantially and positively predicted citizenship performance, whereas the study indicated a negative association. Hypothesis 4c was also not supported by the result of the study.

H4d: Supervisor Narcissism negatively and significantly influence task performance.

This hypothesis attempts to establish a statistical link between supervisor narcissism and task performance. The structural model shown in Table 5.10 indicates that there is no significant relationship between supervisor narcissism ($\beta = .026$, $t = .279$, $p = .780$) and task performance. This implies that there is no direct correlation between the extent of narcissism shown by supervisors and the task performance of employees inside these institutions. The outcome of the investigation did not provide support for Hypothesis 4d.

H4e: Supervisor Narcissism negatively and significantly influence citizenship performance.

The purpose of this hypothesis was to determine the statistical connection between supervisor narcissism and citizenship performance. As depicted in Table 5.10, the overarching structural model shows that supervisor narcissism ($\beta = -.028$, $t = -.275$, $p = .783$) does not significantly predict citizenship performance. This means that the level of narcissism displayed by supervisors does not directly influence citizenship performance of employees in these institutions. Hypothesis 4e was not supported by the result of the study.

H4f: Supervisor Psychopathy negatively and significantly influences task performance.

This hypothesis intended to determine the relationship between supervisor psychopathy and task performance using statistical methods. The structural model shown in Table 5.10 demonstrates that supervisor psychopathy ($\beta = -.264$, $t = -2.399$, $p \leq .05$) had a substantial and negative impact on task performance. This finding suggests that individuals who are under the supervision of psychopathic managers are prone to encountering challenges in their work responsibilities and may have difficulty in efficiently achieving their job-related goals. The conclusion of the investigation provided support for Hypothesis 4f.

H4g: Supervisor Psychopathy negatively and significantly influences citizenship performance.

The purpose of this hypothesis was to determine the statistical connection between supervisor narcissism and citizenship performance. As depicted in Table 5.10, the overarching structural model demonstrates that supervisor psychopathy ($\beta = -.250$, $t = -2.025$, $p \leq .05$) significantly and negatively predicted citizenship performance. This result implies that employees working under psychopathic supervisors are less likely to engage in citizenship behaviours. Hypothesis 4a was supported by the result of the study.

5.3.1 Test for Moderation/Interaction

Moderation occurs when a third variable, referred to as the moderator, influences the relationship between an independent variable and a dependent variable, (Hayes, 2017). This study introduces the notion of the supervisor dark triad as a moderating factor to

examine its potential influence on the relationship between the independent variable, employee engagement, and the dependent variable, organisational results. Certain academics have suggested that it might be beneficial to carry out analyses on moderators in cases where these factors do not demonstrate a statistically significant link with either the independent or dependent variable. This methodology facilitates the differentiation between moderators and mediators, as outlined by Baron and Kenny (1986) and Gogineni, Alsup, and Gillespie (1995).

The R^2 of this estimation was .69 which interprets that the predictors were explaining 69% of the outcome variable. The direct relationship between the moderator (LDT) and the outcome variable (organisational outcomes) was insignificant ($\beta = .020$, $t = .563$, $p = .574$). The study further tested the model concerning the interaction effect of LDT (leader/supervisor dark triad traits) on the direct link between employee engagement and organisational outcomes. As shown in Table 5.11, the result indicates no significant interaction effect ($\beta = -.041$, $t = -1.043$, $p = .297$). Thus, hypothesis five (H5) was not supported.

Table 5.10: Structural Analysis- Direct Relationship

Hypotheses	β	T - value	P -Values	Conclusion
H1a: Employee engagement has a significant positive influence on Organisational outcomes	.774	17.668	***	Accepted
H1b: Employee engagement has a significant positive influence on task performance (TP)	.694	17.432	***	Accepted
H1c: Employee engagement has a significant positive influence on citizenship performance (CP)	.772	17.243	***	Accepted
H2: Employee engagement has a positive significant impact on ICT adoption	.518	12.589	***	Accepted
H3a: ICT adoption has a positive significant impact on organisational Outcomes	.183	3.593	***	Accepted
H3b: ICT adoption has a positive significant impact on task performance	.201	4.344	***	Accepted
H3c: ICT adoption has a positive significant impact on citizenship performance	.177	3.216	.001	Accepted
H4a: Supervisor dark triad trait negatively and substantially influence Organisational outcomes	.020	.563	.574	Not Accepted
H4b: Supervisor Machiavellianism negatively and significantly influences task performance (TP)	.201	3.383	.008	Not Accepted

H4d: Supervisor Narcissism negatively and significantly influences task performance (TP)	-.026	-.279	.780	Not Accepted
H4f: Supervisor Psychopathy negatively and significantly influences task performance (TP)	-.264	-2.399	.016	Accepted
H4c: Supervisor Machiavellianism negatively and significantly influences citizenship performance (CP)	.258	3.382	.015	Not Accepted
H4e: Supervisor Narcissism negatively and significantly influences CP	.028	.275	.783	Not Accepted
H4g: Supervisor Psychopathy negatively and significantly influences (CP)	-.250	-2.025	.043	Accepted
Controls				
Age	.012	.198	.843	
Years of Experience	.002	.365	.715	
Gender	.006	.081	.935	

*Significance at $p < 0.05$; **Significance at $p < 0.01$; *** Significance at $p < 0.001$. Significant when $t \geq 1.96$ for two-tailed.

Table 5.11 Structural Analysis - Interaction Effects

Hypotheses	β	T - value	P -Values	Conclusion
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H5: Supervisor/Leader dark triad trait moderates the relationship between Employee engagement and Organisational outcomes -.041 -1.043 .297 Not Accepted

*Significance at $p < 0.05$; **Significance at $p < 0.01$; *** Significance at $p < 0.001$. Significant when $t \geq 1.96$ for two-tailed.

Table 5.12: Mediation Analysis: Influence of Employee Engagement on Organisational Outcomes through ICT Adoption.

Path	Direct Effect (DE)	Indirect Effect (IE)	Total Effect (D+I)	BSE	BLLCI	BULCI	Mediation
EE → ICT adopt → Org. Out	.766	.095	.861(23.848)	.036	.024	.154	Partial mediation
EE→ICT →Tperf	.682	.105	.786(16.962)	.040	.016	.163	Partial
EE→ICT→Cperf	.764	.087	.851(17.056)	.045	.046	.153	Partial

Note: BSE= Bootstrap Standard Error, BLLCI= Bootstrap Lower Level Confidence interval, BULCI= Bootstrap Upper-Level Confidence Interval. EE= Organisational Outcomes, EE= Employee Engagement, Org. Out= Organisational Outcomes; Tperf= Task performance; Cperf= Citizenship performance.

5.3.3 Test for Mediation

First, the R^2 values of the endogenous variables were estimated and while the mediator (ICT adoption) accounted for .37 thus, 37% variance in the model, the outcome variable (organisational outcomes) accounted for .69 thus, 69% variance and that indicated the significance of the model to be estimated (refer to Figure 5.8). In assessing the mediation effect of the study, the bootstrapping measures were used as indicators to ascertain the magnitude of the effects via the comparison of the bootstrap lower-level confidence interval (BLLCI) and the bootstrap upper-level confidence interval (BULCI).

The study assessed how employee engagement influences organisational outcomes indirectly, through the mechanism of ICT adoption. The result indicates a partial mediation as no zeros fell between the upper and lower level measures. Additionally, dividing the indirect effect by the bootstrap standard error ($.095/.036= 2.64$) produces a result that is greater than 1.96 significance. Thus, H6: ICT adoption mediates the relationship between Employee engagement, and organisational outcomes was accepted ($\beta=.861$, $t=23.848$, $p=.000$) (refer to Table 5.11).

Figure 5.8: Structural Model for Mediation (ICT adoption)

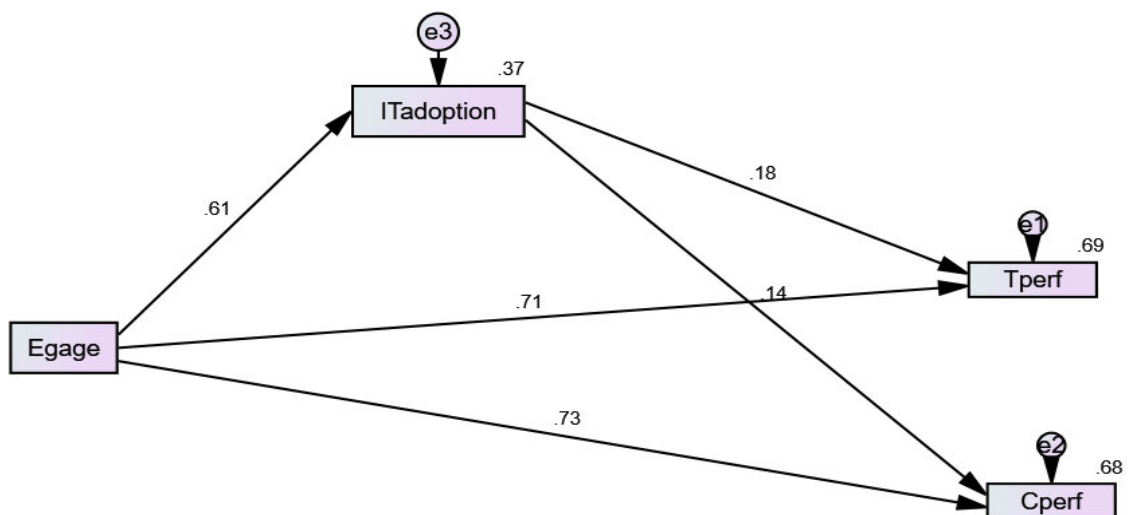


Figure 5.8 shows the path diagram of the how employee engagement influences organisational outcomes indirectly, through the mechanism of ICT adoption.

Table 5.13 Final Outcome of Achieved Objectives

Hypothesis	Outcome
H1a: Employee engagement has a significant positive influence on Organisational outcomes	Accepted
H1b: Employee engagement has a significant positive influence on task performance (TP)	Accepted
H1c: Employee engagement has a significant positive influence on citizenship performance (CP)	Accepted
H2: Employee engagement has a positive significant impact on ICT adoption	Accepted
H3a: ICT adoption has a positive significant impact on organisational Outcomes	Accepted
H3b: ICT adoption has a positive significant impact on task performance	Accepted
H3c: ICT adoption has a positive significant impact on citizenship performance	Accepted
H4f: Supervisor Psychopathy negatively and significantly influences task performance (TP)	Accepted
H4g: Supervisor Psychopathy negatively and significantly influences citizenship performance (CP)	Accepted
H6: ICT adoption positively mediates the relationship between employee engagement and organisational outcomes	Accepted

This study investigated the influence of ICT adoption, and supervisor Dark Triad traits on the relationship between employee engagement and organizational outcomes in Ghanaian technical universities. Table 5.13 shows the achievable results of the hypotheses tested. Hypotheses one revealed a significant and positive influence on organizational outcomes – task and citizenship performance. This means employee engagement is a critical factor that enhances both task and citizenship performance,

contributing positively to overall organizational outcomes. Hypotheses two found a significant and positive influence of ICT adoption. This shows that higher levels of employee engagement lead to greater adoption of ICT, indicating that engaged employees are more likely to embrace and utilize technological advancements. ICT Adoption and Organizational Outcomes was hypothesis to be have significant and positive impacts organizational outcomes –task and citizenship performance and the result indicated tthat ICT adoption is instrumental in improving both task and citizenship performance, thereby enhancing overall organizational outcomes. The outcome of hypothesis four indicate that Supervisor psychopathy has a detrimental effect on both task and citizenship performance, negatively impacting organizational outcomes. This underscores the importance of addressing and mitigating negative supervisor traits to maintain a healthy and productive work environment. Finally the outcome of hypotheses five shows that ICT adoption partially mediates the relationship between employee engagement and organizational outcomes, including task performance and citizenship performance. This means that while employee engagement directly influences these outcomes, a portion of this influence is channeled through the adoption of ICT, enhancing the overall effect on organizational performance.

5.4 Conclusion

This chapter provided a thorough overview of the conclusions obtained from the empirical data analysis. The study began by providing detailed descriptions of the participants' personal data, including factors such as gender, age group, degree of education, length of service, kind of university where respondents work, and staff category. The chapter then provided a comprehensive evaluation of the measurement model to ensure the robustness and dependability of the gathered data. This assessment includes a look at indicator reliability, internal consistency, and convergent and discriminant validity. Individual items and overarching constructs were found to have good levels of reliability and validity in the research.

The chapter further focused on a thorough analysis of the model's fit, confirming that the suggested model adequately related to the observed data. The structural model was thoroughly examined by employing Structural Equation Modelling (SEM) with the use of AMOS. The primary goal was to examine the sixteen hypotheses generated by the

model. To determine the statistical significance of the identified relationships, each hypothesis was subjected to t-statistic analysis.

The results of this research provided support for 10 out of the sixteen hypotheses, which serves as evidence for the strength and credibility of the suggested structural model. The findings presented in this study enhance our comprehension of the complicated dynamics within the context being examined, providing insight into the complex interrelationships among the variables being studied. The findings have far-reaching consequences for theoretical frameworks, practical applications, and future investigations within the discipline.

CHAPTER SIX

DISCUSSION OF RESULTS

6.1 Introduction

In the previous chapter, the study provided an overview of its findings, data presentation, and analysis. This sixth chapter of the thesis conducts a thorough discussion of the results obtained after the collected data has been thoroughly analysed. The discussions carefully assess the findings of the studies and then compare them to the existing literature, which includes both empirical and theoretical sources. The focus of these discussions stays firmly anchored in the study objectives and hypotheses. The chapter begins by examining the results of the predicted correlations developed between the various components under consideration. Employee engagement, which includes cognitive, emotional, and behavioural engagement; organisational outcomes, which encompass task performance and citizenship performance; the supervisor dark triad, which includes Machiavellianism, narcissism, and psychopathy; and ICT adoption, which serves as a mediating construct. Each of these interactions is investigated and contextualised thoroughly within the context of the evaluated literature and pertinent theoretical frameworks. The study further discusses the moderating role of supervisor dark triad and finally, the mediating role of ICT adoption in the relationship between employee engagement and organizational outcomes. Empirical evidence from previous studies and relevant theories have also been used to support the discussions. The results are discussed below.

6.2. Employee Engagement and Organisational Outcomes

The first objective of this research was to examine the influence of employee on organisational outcomes within the specific context of technical universities. This examination was conducted by considering employee engagement and organizational outcomes both as a composite variable and as a multidimensional construct, with task performance (TP) and citizenship performance (CP) serving as its constituent dimensions. In alignment with this aim, three hypotheses (H1a, H1b, and H1c) were formulated and then examined. The results of the data analysis provided confirmation for the three hypotheses. The findings of the study indicate a strong and positive relationship between employee engagement and organisational outcomes in the

technical universities of Ghana, thereby verifying hypothesis H1a. The aforementioned observation aligns with the research conducted by Bakker, Demerouti, and Sanz-Vergel (2014) on the topic of academic engagement within university settings. Their study revealed that individuals who demonstrate higher levels of involvement in their professional roles tend to display greater research productivity and teaching effectiveness in comparison to those who exhibit lower levels of engagement. The findings of this study also align with the research conducted by Hakanen, Bakker, and Schaufeli (2006) on teachers in Finland. Their study investigated the relationship between burnout, work engagement, and task performance, and revealed that employees who are highly engaged demonstrate superior levels of task performance compared to those who are less engaged. According to Shuck and Wollard (2010), there is a positive correlation between employee engagement and work satisfaction, as well as dedication to the organisation. This relationship is also observed in the quality of customer service exhibited by engaged employees. This finding is consistent with the findings of Agarwal et al. (2012:208) in their study, which revealed a positive correlation between work engagement and innovative work behaviour, as well as a negative correlation with desire to leave. In particular, when employees are actively involved and invested in their work, there is a notable boost in their productivity levels, while the likelihood of voluntary turnover is reduced. In a study conducted by Moletsane, Tefera, and Migiro (2019), a notable association was found between employee engagement and productivity as an organisational result. The present study's findings duplicate previous research, so confirming and extending the existing body of knowledge. Specifically, the results indicate that engaged employees tend to outperform their disengaged counterparts across many circumstances.

In light of the JD-R theory, employees who are engaged are in a pleasant and gratifying frame of mind, characterized by high levels of enthusiasm, devotion, and involvement in their job. This participation benefits both employees and businesses since the theory is viewed as a motivating process that occurs when workplace resources engulf job needs.

Secondly, with respect to the correlation between employee engagement and task performance, the research provides evidence supporting the notion that employee engagement has a substantial and favourable impact on task performance at the technical universities of Ghana. As a result, hypothesis H1b is accepted. This

observation suggests that in Ghana's technical institutions, when staff members are actively engaged and included in the decision-making process and subsequent implementation, they have a sense of worth and, consequently, demonstrate exceptional performance in carrying out their given jobs (e.g. teaching, research, administrative services, community service) both individually and collectively. The findings of this study align with other research investigating the correlation between employee engagement and task performance (Christian et al., 2011; Moletsane et al., 2019; Uddin, Mahmood, & Fan, 2019). This finding underscores the importance of cultivating employee engagement in the workplace and underscores the potential advantages for both individuals and companies. According to Chanana and Sangeeta (2021), there is a positive correlation between employee engagement and their levels of motivation, work satisfaction, and dedication. The heightened level of commitment results in enhanced performance in completing tasks. Personnel who possess a strong emotional connection to their job and organisation often experience a high frequency of positive feelings. According to a study conducted by Abolnasser, Abdou, Hassan, and Salem (2023), this phenomenon has been found to have a positive impact on individuals' work satisfaction. The results of this study align with the findings of Pattnaik and Sahoo (2021), who conducted a quantitative analysis involving 396 workers and their clients in India. Their research revealed a positive correlation between employee engagement and job performance. In a recent study conducted by Bhardwaj and Kalia (2021), it was found that the variables of vigour, dedication, and assimilation in employee engagement have a significant impact on contextual performance. Additionally, the study revealed that the task performance of employees is influenced by their levels of vigour and focus. The research was conducted in four districts of Himachal Pradesh, utilising a multistage sampling technique and a sample size of 360 hotel employees. Research has shown that there is a positive correlation between employee engagement and several desirable outcomes, such as increased effort, productivity, and a willingness to exceed job expectations (Burnett and Lisk, 2019; Pattnaik and Sahoo, 2021). Individuals have a greater propensity to assume leadership roles, demonstrate proactive behaviour, and actively seek out prospects for personal growth and career progression.

The third hypothesis of the first objective examined the relationship between employee engagement and citizenship performance. The findings of the examination demonstrate that there exists a notable and favourable correlation between employee engagement

and citizenship performance within the specific setting of technical universities in Ghana. As a result, hypothesis H1c has been validated. The obtained outcome aligns with the research conducted by Ariani (2013), which investigated the correlation between employee engagement, organisational citizenship behaviour (OCB), and counterproductive work behaviour (CWB) among a sample of 507 service industry employees in Yogyakarta, Indonesia. The study revealed a statistically significant positive association between employee engagement and OCB. Furthermore, the obtained outcome aligns with the research conducted by Shantz, Alfes, Truss, and Soane (2013). Their study involved surveying 283 employees within a consultancy and construction firm based in the United Kingdom. The researchers discovered that individuals occupying positions characterised by elevated levels of autonomy, task variety, task significance, and feedback exhibit higher levels of engagement. Consequently, these employees receive superior performance evaluations from their supervisors, actively engage in organisational citizenship behaviours, and contribute more to organisational innovation. In a study done in Bangladesh, Al Ahad and Khan (2020) found a strong positive relationship between Employee Engagement and Organisational Citizenship Behaviour. The researchers employed a non-probability convenient sampling approach and collected data from a sample of 300 workers across seven distinct enterprises. Engaged employees exhibit proactive behaviour through their voluntary inclination to beyond their designated job duties (Baumruk and Gorman, 2006; Markos & Sridevi, 2010; Organ, 1988; Bakker, 2011; Christian et al., 2011; Rastogi, Kataria, and Garg., 2013). Individuals actively pursue chances to make meaningful contributions to the overall success and welfare of the organisation. This may be providing support to colleagues, suggesting improvements, or engaging in projects that contribute to the betterment of the company. Employees who are engaged demonstrate a willingness to provide support to their colleagues and contribute to the overall success of the company (Cheng and Chen, 2017; Bolino and Turnley, 2003; Karatepe, 2013b; Rich et al., 2010). They provide assistance, exchange information, and extend aid when required. According to Ibrahim and Al Falasi (2014), employees who are engaged have a profound feeling of devotion and dedication towards their organisation. The scope of this allegiance stretches beyond the confines of their own activities and obligations. This conduct fosters a favourable work atmosphere and enhances the team's productivity. This study contributes to the existing discourse on the positive impact of employee engagement on individual performance (Rich, LePine, and

Crawford, 2010; Christian et al., 2011), group performance (May et al., 2004), and organisational financial performance (Schaufeli and Bakhtiar, 2008) by incorporating the perspectives of technical university staff in Ghana.

6.3 Employee Engagement and ICT Adoption

The second objective sought to examine the relationship between employee engagement and ICT adoption as the study proposed a positive and significant relationship between the two. The outcome revealed a positive and highly significant relationship between the two. Thus, hypothesis two (H2) was supported. This indicates that the likelihood of employees adopting and utilising ICT tools and technologies increases as employee engagement levels rise. This correlation suggests that engaged employees are more receptive to the incorporation of technology into their daily duties and are willing to adopt and utilise digital tools to improve their work efficiency. Thus, in the technical universities of Ghana when members of the staff are engaged through involvement and consultation, the tendency to adopt ICT in their operations is higher and that could translate to higher productivity and performance in the form of effective teaching, improved research and community service. This outcome is consistent with the study of Patnaik and Sahoo (2021) that empirically observed employee engagement, creativity, and task performance using sample of 396 employees and clients in an Indian software development organisation and found that employee engagement was positively related to employee creativity. The result also mirrors the observation of Benitez, Ruiz, and Popovic, (2022) who in their study tested with a survey dataset from 134 firms discovered that mobile technology-enabled HR gamification initiative improves job satisfaction and employee engagement. Employees who are engaged are more likely to be motivated and excited about their work. They may see ICT adoption as a chance to boost productivity, streamline operations, and produce better results (Tzenios, 2019). This positive mind-set makes people more willing to embrace new technology and put forth effort in learning and effectively utilising them. In line with existing literature, engaged staffs are dedicated and eager, and they are expected to use creative techniques to complete their tasks (Patnaik and Sahoo, 2021). Likewise, highly engaged employees are more likely to embrace change and be open to new technologies and procedures (Burnett, and Lisk 2019; Macey et al 2009).

In the lens of the JD-R theory, the introduction of new technologies and ICT adoption may place initial job demands on employees, such as learning new systems or adjusting

to changes in work procedures. Employees may overcome these demands more successfully provided they have access to suitable job resources (ICT adoption), such as training programs, technical assistance, and a supportive work environment. These materials provide employees with the support and confidence needed to embrace technology and use it successfully in their job, resulting in higher engagement. Employees that are enthusiastic about their jobs are more likely to accept and use ICT tools and systems.

6.4 ICT Adoption and Organisational Outcomes

This study's third objective was to establish the influence of ICT adoption and SDT on organisational outcomes (task and citizenship performance) in Technical Universities of Ghana. The relationship between ICT adoption and organisational outcomes was first examined. Three propositions underpinned this objective and were further tested (H3a, H3b and H3c). Firstly, it was hypothesised that ICT adoption will positively impact organisational outcomes. It was anticipated that as information and communication technology (ICT) is placed at the heart of operations in the technical universities of Ghana, organisational outcomes, specifically, task performance and citizenship performance will be enhanced. The estimated results from the study (*see Table 5.6*) showed that ICT adoption significantly and positively impacts organisational outcomes, specifically, task performance and citizenship performance. Thus, h3a, h3b, and h3c were all accepted. This explains that when ICT is adopted in technical universities of Ghana, staff can execute tasks assigned to them successfully, and overall performance is increased. Alternatively, an increase in ICT adoption will directly increase organisational outcomes (TP and CP) in the same tangent.

Hypotheses three (H3a-c) were premised on the JD-R Theory with ICT adoption considered as job demands and organisational outcomes (TP and CP) as the consequences, and studies by Viète and Erdsiek (2020), Yunis, Tarhini and Kassar (2018), Barba-Sanchez, Calderón-Milán and Atienza-Sahuquillo (2018), as well as Rusdi, Hassan, Munir, and Mohamad (2017).

The JD-R theory upholds the availability and efficient use of ICT tools and platforms are touted job resources that improve efficiency, kindle ingenuity and collaboration, facilitate knowledge exchange, and increase employee contentment and engagement. As a result, technical university personnel who understand and apply ICT may help

their institutions achieve superior organizational outcomes for students, co-workers, and the university. Technical university staff that are unable to use ICT in time such as during the COVID-19 period risk losing ground to rival institutions, thereby harming students, co-workers, and the university as a whole.

Viete and Erdsiek (2020:14) found empirical support for the argument that the adoption of mobile ICT positively and significantly enhanced favourable organizational practices by using regression analysis based on a production function framework and exploiting fine-grained firm survey data on ICT use and favourable organizational practices for 1,045 service firms in Germany. This research revealed that workplace adoption and use of mobile ICT improved positive organizational outcomes.

Yunis, Tarhini, and Kassar (2018:354) on the other hand investigated the association between information and communication technology utilization and organizational performance in the Lebanese market. Their focus was on employees, department heads, and managers who used ICT applications in Lebanon-based SMEs. The convenience sampling method was used, as they discovered a strong and favourable association between ICT use and organizational performance. This conclusion showed that ICT use was a strategic resource that helped SMEs to obtain a long-term competitive advantage which enabled them to improve organizational performance.

Barba-Sanchez et al. (2018:1401) studied the influence of a firm's ICT adoption intensity on corporate performance. The study included 871 SMEs in Spain, and data were analyzed using ordered logistic regression and principal axis factoring analysis. A positive and statistically significant association between ICT intensity of use and company performance was observed. This conclusion emphasized the significance of ICT in highly competitive contexts. The researchers opined that complete integration of ICT in a corporation improves corporate performance.

Rusdi, Hassan, Munir, and Mohamad (2017:7841) found that management support and ICT training had a favourable and substantial association with employee performance, however, technology utilization had an insignificant relationship. According to this result, management support for ICT adoption and ICT training provided to employees improved their performance.

The empirical results of this current study are consistent with earlier research (Viète and Erdsiek, 2020; Yunis, Tarhini, and Kassar, 2018; Barba-Sanchez, Calderón-Milán, and Atienza-Sahuquillo, 2018; Rusdi, Hassan, Munir, and Mohamad, 2017), and the findings are supported by the JD-R Theory.

6.5 Supervisor Dark Triad and Organisational Outcomes

The third objective of this study further examined the extent to which supervisor Dark Triad (DT) influence organisational outcomes in Ghanaian technical universities. To accomplish this goal, seven hypotheses (H4a, H4b, H4c, H4d, H4e, H4f, and H4g) were formulated and tested. The first hypothesis (H4a) examined the relationship between supervisor DT traits (Machiavellianism, Narcissism, and Psychopathy) and organisational outcomes, with the initial assumption being that these DT traits would have a negative and significant impact on outcomes. However, the result of the data refuted this assertion, leading to the rejection of hypothesis H4a. Previous empirical research (Huang et al., 2019; Rice et al., 2020; Moin et al., 2020; Younus et al., 2020) has consistently demonstrated a negative and significant relationship between DT characteristics in leaders and a variety of organisational outcomes. These earlier studies found evidence that leaders with DT characteristics tend to have a negative impact on employee morale, performance, and organisational effectiveness as a whole. This study's contradictory findings suggest that the effect of DT traits on organisational outcomes may be complex and context-dependent. The context of Ghana's technical universities, in which leadership is rotated among senior faculty members, could be a significant contributor to the findings of the study. This rotational leadership strategy could mitigate the impact of individual leader characteristics on organisational outcomes, as leaders with various characteristics would rotate into leadership positions.

6.5.1 Supervisor Machiavellianism and Task and Citizenship Performance

Secondly, the study examined the relationship between supervisor Machiavellianism and two aspects of organisational performance: Task Performance (TP) and Citizenship Performance (CP). The study suggested that supervisor Machiavellianism would have a negative and considerable influence on both TP and CP. The evidence, however, contradicted this theory, as the impact of Machiavellianism on TP was shown to be positive, while the negative impact on TP and CP was not substantiated. H4b and H4c were therefore rejected. A possible reason is that Machiavellian bosses are adaptable and pragmatic, allowing them to negotiate difficult organisational situations efficiently.

In certain cases, their capacity to make difficult decisions and utilise strategic techniques may result in beneficial consequences for the firm. Some employees may see Machiavellian leaders as assertive and decisive, making them more receptive to their orders and, as a result, doing better on the job. This view may overshadow Machiavellianism's negative qualities. This notwithstanding, the outcome gives credence to the study by Uppal (2022), which proposes a curvilinear relationship between the dark triad traits (Machiavellianism, psychopathy and narcissism) and job performance and also examines the moderation effect of traitedness on the dark triad–job performance relationship. Drawing on data from 382 participants in a financial services firm in India, and conducting a two-phase study to examine the curvilinear and moderation effects, the study confirmed that the relationship between dark triad traits and job performance is positive at the lower end of dark triad traits but flattens out as the dark triad traits intensify. It is, therefore, not in error that this current study made similar observations where at the lower of dark triad traits, Machiavellianism was positively significant but flattened at the midpoint.

6.5.2 Supervisor Narcissism and Task and Citizenship Performance

Thirdly, the study looked at the relationship between supervisor narcissism and task and citizenship performance. According to the hypothesis, supervisor narcissism would have a negative and significant impact on TP and CP. Nonetheless, the results (H4d and H4e) disputed this assumption, leading to the rejection of H4d and H4e. Surprisingly, these findings contradict past empirical research in other contexts, which consistently found a negative and statistically significant association between leader narcissism and a number of employee-related outcomes. Employee perceptions of ethics and social responsibility, corporate social responsibility initiatives, organisational citizenship behaviour towards supervisors, and employee voice are among the effects. Previous studies (Myung et al., 2017; Li, Ye, and Zhang, 2018; Huang, Krasikova, and Harms, 2020) found consistent evidence of leader narcissism's harmful consequences on employee behaviours and attitudes. The contradicting findings, indicate that the influence of supervisor narcissism on employee task performance and behaviour may be dependent on a number of contextual factors. The relationship between leader narcissism and employee outcomes may be moderated by organisational culture, leadership style, employee characteristics, and other situational variables. Furthermore,

the study's sample characteristics and the backdrop of Ghana's technical institution could have influenced the conclusions.

6.5.3 Supervisor Psychopathy and Task and Citizenship Performance

Last but not the least, the study investigated the association between supervisor psychopathy and two dimensions of organisational outcomes: Task Performance (TP) and Citizenship Performance (CP). The hypothesis posited that supervisor psychopathy would exert a negative and significant influence on both TP and CP. The acceptance of hypotheses H4f and H4g was based on the data's support for this statement. This result is consistent with prior empirical research in other contexts, which has consistently demonstrated a negative and statistically significant relationship between leader psychopathy and a variety of employee outcomes. Khan et al. (2020), Boddy and Taplin (2016), and Myung et al. (2017) all discovered detrimental effects of psychopathic leadership on career satisfaction, job satisfaction, and employees' perceptions of ethics, social responsibility, and corporate social responsibility activities, respectively. The findings of the current study provide additional support for Uppal's (2022) contention that there is a curvilinear relationship between the dark triad traits (Machiavellianism, psychopathy, and narcissism) and job performance. In particular, the study confirmed that the relationship between dark triad traits and task and citizenship performance was negative and statistically significant at the extreme (darkest) end of these traits, especially for psychopathy. The findings indicate that supervisor psychopathy may have negative effects on employee task performance and conduct, resulting in lower levels of TP and CP.

Overall, the findings of the third objective, which examined the influence of leader Dark Triad traits (Machiavellianism, Narcissism, and Psychopathy) on organisational outcomes (Task Performance and Citizenship Performance), are consistent with previous research by Smith, Craig Wallace, and Jordan (2016), Szabó, Czibor, Restás, and Bereczky (2018), Vaughan and Madigan (2021), and Uppal (2022). These studies have also revealed that the various dimensions of Dark Triad traits are associated with varying levels of performance under various circumstances. The context of this research, which focuses on leadership in academia, specifically in technical universities, has a substantial impact on the observed results. In technical universities, the leadership is revolving, and senior members occupy positions for fixed terms that

are subject to renewal. This unique leadership structure may explain why leaders or superiors in this context are unable to exhibit the more sinister Dark Triad characteristics. As leaders are subject to supervision, they may have a reduced propensity to engage in manipulative or exploitative behaviour under a system of rotational leadership. In addition, the majority of respondents in this study were teaching staff, and it may be unusual for their coworkers to exhibit exceedingly negative attitudes towards them. The context of an academic institution may differ from corporate institutions, where power dynamics and organisational structures may facilitate the exhibit of negative leadership traits. Consequently, this factor may explain the insignificant relationship between narcissism and performance and the positive relationship between Machiavellianism and performance observed in this study.

The Affective Events Theory, which proposes that personality traits can also shape individuals' regular responses to life events, regards the high supervisor/leader dark triad (high Machiavellianism, psychopathy, and narcissism) as negative emotional events experienced by employees at work due to leaders/supervisors' negative temperaments, which suppresses their level of work engagement, manifested in feelings of exhaustion, neglect, and indifference. Contrariwise, the theory regards the low supervisor/leader dark triad (low Machiavellianism, psychopathy, and narcissism) as positive emotional procedures towards employees at the workplace as a result of leaders/supervisors' positive dispositions, which encourages or inspires those employees to improve organizational outcomes. The JD-R theory on the hand holds that supervisor dark triad traits increase job expectations and diminish job resources for employees. These variables contribute to lower employee well-being, work satisfaction, and engagement, which can harm organizational outcomes such as lower productivity, more turnover, and lower overall performance.

6.6: The Moderating Role of Leader/Supervisor Dark Triad

The next objective of the study was to examine the moderating role of supervisor dark triad traits in the relationship between employee engagement and organisational outcomes. This objective sought to establish whether the achievement of organisational outcomes was dependent on various levels of the dark triad traits of leaders. Hence, it was hypothesised (H5) that the supervisor dark triad will moderate the relationship

between employee engagement and organizational outcomes such that this relationship is weakened at high SDT than at low levels of SDT.

The result of the study revealed no significant effect as regards the moderation effect. Thus, hypothesis 5 of the study was not accepted. This outcome contradicts the finding of Bouncken, Cesinger and Tiberius (2020:299) who surveyed 191 firms and empirically tested if the actions of top managers who score high on the dark triad would weaken employee's entrepreneurial orientation-firm performance relationship and vice versa, and observed that manager dark triad suppressed the positive effect that employee's entrepreneurial orientation had on firm performance. The data from the staff of technical universities in Ghana found no significance for the supervisor dark triad serving as a boundary condition in the direct link between employee engagement and organisational outcomes. Thus, regardless of the low and high ends of SDT, not much difference is seen in supervisors' actions toward other staff members. Moreover, because most of the respondents were teaching staff, the study attributes this outcome to the rotational leadership practised in this setting where leadership lasts but for a while for another to take over.

From a theoretical perspective, drawing on the Activation Theory, the study proposed that the relationship between employee engagement and organizational outcomes could be influenced by the amount of stress employees are subjected to by their supervisors. Thus, a desirable or ideal amount of stress experienced by an engaged employee from his/her supervisor's activities might encourage him/her to execute tasks and display citizenship behaviour for the benefit of his/her technical university and too much stress, in the form of supervisor dark triad, could undermine an engaged employee's capacity to accomplish a task and display citizenship behaviour, thereby lowering organisational outcomes. Additionally, In line with the JD-R theory, it was suggested that supervisors with high Machiavellianism, narcissism, or psychopathy may introduce additional job demands or deplete job resources for their subordinates. The data did not support these assertions with many attributions to the context because staff may conclude that being assigned complex and demanding tasks may add to their experience and will be instrumental during the period when the staff is seeking promotion.

6.7: The Mediating Role of ICT Adoption

The study further assessed the mediating role of ICT adoption in the relationship between employee engagement and organisational outcomes. Three hypotheses underpinned these claims (H6a, H6b, and H6c) and they were further tested on the data to achieve this objective. A mediation test using the bootstrapping approach was adopted and the results are discussed below.

The test indicated that ICT adoption partially mediates the link between employee engagement and organisational outcomes (TP and CP) in the technical universities in Ghana. This explains that although engaging employees could lead to increased performance, the adoption of ICT could serve as a mechanism through which enhanced performance could be attained. As a result, hypotheses (H6a, H6b, and H6c) were all accepted. From these results, this current study presents that in addition to the direct link between employee engagement and organisational outcomes, the indirect link through mechanisms such as ICT adoption is also significant. Previous research (Jena, Bhattacharyya, and Pradhan, 2017; Eldor, 2017; Jordan, Al-dalahmeh, Khalaf, and Obeidat, 2018; Kapil and Rastogi, 2019; Khan, 2020) have argued that indirect relationships between employee engagement and outcome variables may also be critical to examine to make significant contributions to existing literature. Hence, the consideration of organisational politics, employee voice, job satisfaction, creativity, and job-embeddedness as mechanisms through which these indirect paths could be created. They observed mostly partial mediation effects in the end. This current study adds that in the context of technical universities in Ghana, the adoption of ICT indirectly impacts organisational outcomes, specifically regarding the task and citizenship performance of engaged employees.

This study's conclusions align with the principles of the emotional events theory and the JD-R theory, indicating that ICT adoption plays a partly mediating role in the positive connection between employee engagement and organisational results, such that a highly engaged employee after the adoption of new technologies achieve task and citizenship performance for the benefit of his/her Technical University. Additionally, with the adoption of ICT, the once daunting task could be easily executed by engaged employees to increase productivity and also save time as resources are made available to them, and a supportive work environment is created (Bakker and Demerouti 2007; 2018).

6.8 Conclusion

This chapter described the study's findings. The discussions focussed on the primary findings based on the research objectives and hypothesis. Explanations were provided for both supported and unsupported findings. The results that were supported were consistent with previous empirical investigations.

The next chapter summarises the study, its contributions, suggestions, and limitations, as well as making recommendations for further research. The summary attempts to address all of the research questions. Finally, it offers closing remarks on the overall argument.

CHAPTER SEVEN

SUMMARY OF FINDINGS, RECOMMENDATION, AND CONCLUSION OF THE STUDY

7.1 Introduction

This chapter provides a concise overview of the main results of the study, assesses the extent to which the research objectives were met, and draws conclusions based on the analysis of the collected data. The subsequent part discusses the contribution of the research from theoretical, managerial, methodological, and practical perspectives. Furthermore, the chapter provides recommendations derived from the results reached, while also acknowledging limitations and suggesting areas for future research. The conclusion section summarises each chapter of the study and reflects on the entire thesis.

7.2 Summary of Findings

The purpose of this study, which was done among both teaching and non-teaching employees at Ghanaian technical institutions, was to investigate the relationship between employee engagement, organisational results, ICT adoption, and the function of the supervisor dark triad. Employee engagement was a composite concept that included cognitive, emotional, and behavioural involvement, while organisational results were represented by task performance and citizenship performance. The possible effect of ICT adoption on the link between employee engagement and organisational results was explored as a mediating factor, and the supervisor dark triad as a moderator was also investigated.

The study specifically intended to comprehend how ICT adoption can moderate the relationship between employee engagement and organisational results. Furthermore, it attempted to assess how the supervisor dark triad, as a moderator, may influence the strength of the predicted relationships between these factors. The theoretical basis for these interactions were principally derived from the JD-R Model (Demerouti et al., 2001), the Affective Event Theory (Weiss & Cropanzano, 1996), and the Activation Theory (Gardner; Gardner & Cummings, 1988).

The research was grounded on the underlying assumption that in response to global competition, businesses have been compelled to enhance quality, cost-effectiveness, and productivity by embracing technology and fostering employee involvement (Datta, 2010). The extent of employee engagement within an organisation is examined when confronted with external factors, such as the COVID-19 pandemic, which has transformed the nature of work into predominantly online endeavours. There is a scarcity of research examining the direct correlation between employee engagement and the adoption of information and communication technology (ICT), as well as the mediating role of ICT adoption and the moderating role of supervisor dark triad traits on the relationship between employee engagement and organisational outcomes, specifically task performance and citizenship performance. This gap in the literature is particularly evident in the context of Ghana, and even more so within technical universities.

The research sought out to accomplish a number of key objectives. First, it sought to investigate the relationship that exists between employee engagement and organisational outcomes. Second, the study intended to determine the extent to which attributes related with the supervisor dark triad may possibly modify the association between employee engagement and organisational results. Finally, the study sought to investigate the role of ICT adoption in moderating the relationship between employee engagement and organisational results.

Following a thorough examination of relevant literature, hypotheses were developed. These hypotheses were deeply rooted in relevant theories, allowing the researcher to make significant links between the study's findings and the theories and literature under consideration.

The research design employed in this study is descriptive and explanatory, with a guiding philosophy rooted in positivism. This approach aims to explore and understand the correlations that exist between different variables. The target demographic encompasses both teaching and non-teaching personnel from five technical universities in Ghana, totaling 3,003 persons. Questionnaires were utilised to obtain data from a total of 280 individuals, with a response rate of 84%. The study employed the use of Structural Equation Modelling (SEM) using the software programme Amos for both descriptive and inferential data analysis.

Based on the purpose of the study, research questions were posed to be answered to meet the objectives of the study. This section provides answers to each of the research questions, which are stated below.

RQ1: What is the influence of employee engagement on organisational outcomes (task and citizenship performance) in Technical Universities of Ghana?

Guided by the first research objective, this question sought to clarify whether employee engagement has a direct positive impact on organisational outcomes. Three hypotheses were developed to achieve this objective. All the assertions were supported by the data of the study. Firstly, employee engagement had a significant and positive influence on organisational outcomes ($\beta = .774$, $t = 17.668$, $p \leq .000$). Secondly, the link between employee engagement and the two dimensions of employee engagement was assessed and turned out to be positive and significant respectively: TP ($\beta = .694$, $t = 17.432$, $p \leq .000$) and CP ($\beta = .772$, $t = 17.243$, $p \leq .000$). From these results, it is evident that the first objective of the study was achieved. Therefore, in the context of the technical universities in Ghana, the influence of employee engagement on organizational outcomes (task and citizenship performance) is significant and positive.

The outcomes of the study suggest a positive correlation between increased levels of employee engagement and improved task performance and citizenship performance within technical universities. When employees exhibit high levels of engagement, they demonstrate increased levels of motivation, commitment, and investment in their respective job responsibilities. The increased level of employee involvement leads to enhanced task performance, characterised by heightened concentration, productivity, and efficacy in fulfilling work duties. Employees that are actively involved and committed to their work are more inclined to achieve employment objectives, exhibit superior performance, and sustain their technical proficiency in their assigned activities. In addition, employees who are actively involved in their work are more inclined to exhibit prosocial behaviours, such as providing assistance to their colleagues, aiding new staff members, and taking proactive measures to contribute to the overall welfare of the university. The individual's optimistic demeanour and proactive approach in exceeding their primary responsibilities contribute to the establishment of a favourable work atmosphere and the cultivation of a collective spirit of cooperation and synergy.

In general, the results indicate that cultivating employee engagement within technical colleges in Ghana has the potential to provide positive organisational consequences, such as heightened task performance and citizenship performance. In order to enhance employee engagement within these universities, it is imperative for management to prioritise this objective through the implementation of diverse strategies. These strategies may include facilitating opportunities for ongoing skill development, fostering improved research endeavours, implementing recognition and rewards systems, cultivating a positive work culture, and establishing an environment that is conducive to employee growth and meaningful contributions towards the institution's overall success.

RQ2: What is the influence of employee engagement on ICT adoption in Technical Universities of Ghana?

In line with the second objective of the study, the result indicated that the influence of employee engagement on ICT adoption in Technical Universities of Ghana is positive and significant ($\beta = .516$, $t = 12.650$, $p \leq .001$). Thus, objective two of the study was achieved.

The findings of the study suggest a favourable relationship between higher levels of employee engagement and a greater propensity and openness to adopting information and communication technology (ICT) within the institutions being examined. When employees demonstrate a heightened degree of engagement, they tend to display greater openness and receptiveness towards workplace changes and innovations. This entails adopting the use of emerging technology, such as Information and Communication Technology (ICT). Employees who demonstrate high levels of engagement and dedication towards their work are more likely to acknowledge the importance and benefits of incorporating technology to enhance different facets of their job, including curriculum development, course delivery, student assessment, administrative support, human resources, student services, research and scholarship, community service and so on. This includes optimising communication channels and enhancing overall effectiveness. Once again, it is apparent that persons who are highly engaged in their profession are prone to actively seek opportunities to improve their skill sets, particularly in the realm of technology, and quickly embrace innovative methods to

their work. As a result, employees demonstrate a heightened propensity to embrace and integrate information and communication technology (ICT) solutions to enhance their professional effectiveness and contribute significantly to the institution's digital transformation. Moreover, individuals who are actively involved in their work are more inclined to engage in collaborative efforts and exchange information with their peers. This, in turn fosters a favourable social influence within the organisational context. When employees witness their highly involved colleagues efficiently utilising technology and achieving favourable results, they are more inclined to emulate their behaviour and embrace information and communication technology (ICT) themselves.

In general, the results indicate that the promotion of employee involvement within Technical Universities of Ghana has the potential to result in increased levels of ICT adoption. The cultivation of an engaged culture, the provision of training and support for employees to enhance their digital competencies, and the promotion of collaboration and knowledge-sharing are imperative for managers in technical universities. These efforts aim to establish an environment wherein employees are motivated to embrace and effectively utilise information and communication technology (ICT) to enhance their work processes and contribute to the institution's digital advancement and achievements.

RQ 3: To what extent do ICT adoption and Supervisor Dark Triad traits influence organisational outcomes (task and citizenship performance) in Technical Universities of Ghana?

The third objective was to ascertain the extent to which ICT adoption and SDT influence organisational outcomes (task and citizenship performance) in Technical Universities of Ghana. Ten hypotheses were developed to meet this objective. The relationship between ICT adoption and organisational outcomes was examined and three hypotheses were developed. First, it was proposed that the adoption of ICT will positively and significantly impact organisational outcomes. The extent to which ICT adoption influence organisational outcomes (task and citizenship performance) in Technical Universities of Ghana is positive and significant ($\beta=.183$, $t=3.593$, $p\leq.000$). Thus, hypothesis H3a was accepted and it indicates that the adoption of ICT could potentially enhance organisational outcomes in Technical universities of Ghana. Secondly, the link between ICT adoption and task performance (TP) was assessed as it

was argued that the adoption of ICT in Technical universities of Ghana will influence their task performance (TP) ($\beta=.201$, $t=4.344$, $p\leq.000$) and this claim was also supported in the study. Finally, the study hypothesised that ICT adoption in Technical universities of Ghana will impact citizenship performance positively and significantly. The result of the study supported the assertion ($\beta=.177$, $t=3.216$, $p\leq.001$). After testing all the above hypotheses, objective three on the influence of ICT adoption and organisational outcomes was achieved and the research question was equally answered.

This suggest that when these universities embrace and implement information and communication technology (ICT) effectively, it leads to improvements in both task performance and citizenship performance where assigned tasks are successfully executed and set targets are achieved timely. ICT adoption enhances communication, collaboration, and efficiency in various work processes, leading to better task performance as employees can complete their job objectives more effectively. Additionally, improved ICT adoption fosters a positive work environment, where employees are more likely to engage in citizenship behaviours, such as helping others, taking initiative, and contributing to the overall success of the university. Technical universities should implement strategies to encourage technology adoption that can lead to positive improvements in performance and efficiency.

The second assertion was that SDT would negatively and significantly influence organisational outcomes but the result did not support this claim ($\beta=.020$, $t=.563$, $p=.574$). This explains that the fact that a supervisor exhibits dark triad traits does not imply that organisational outcomes will be negatively impacted in the context. It was further argued that the three dimensions of SDT (Machiavellianism, Narcissism, and Psychopathy) will negatively and significantly influence Task Performance (TP). The result rather revealed a positive significant relationship between Machiavellianism and TP ($\beta=.201$, $t=3.383$, $p=.008$) and a negative insignificant relationship between Narcissism and TP ($\beta=-.026$, $t=-.279$, $p=.780$). However, the relationship between Psychopathy and TP was negative and significant ($\beta=-.264$, $t=-2.399$, $p=.016$). Thus, hypotheses h4b and h4d were both rejected but the h4f was accepted by the study. This indicates that at the lower end of SDT where psychopathy is exhibited, staff in technical universities in Ghana are likely to react by replicating the treatment given to them. Additionally, the dimensions of SDT were assessed on citizenship performance (CP) and the results revealed a similar outcome as that of task performance:

Machiavellianism had a positive significant relationship with CP ($\beta=.258$, $t=3.382$, $p=.015$), Narcissism had a negative and insignificant relationship with CP ($\beta=-.028$, $t=-.275$, $p=.783$). However, Psychopathy had a negative and significant impact on CP ($\beta=-.250$, $t=-2.025$, $p=.043$). Altogether, hypotheses h4c and h4e were both not accepted but h4g which contained Psychopathy was accepted.

The lack of statistical significance in the relationship between supervisor dark triad traits and organizational outcomes suggests that in the context of technical universities in Ghana, supervisor dark triad traits do not have a meaningful impact on the task and citizenship performance of employees. It implies that these specific dark triad traits (Machiavellianism, psychopathy, narcissism) displayed by supervisors may not significantly affect how employees perform their tasks or contribute to the overall citizenship behaviors within the organization. Again, the significant positive relationship between supervisor Machiavellianism and task and citizenship performance implies that supervisors who exhibit Machiavellian traits are more likely to have employees who perform better in their tasks. Organizations should be aware of the potential positive effects of supervisor Machiavellianism on task and citizenship performance, but also consider the ethical implications of such behaviour. Additionally, the non-significant relationship between supervisor narcissism and task and citizenship performance implies that, in the context of technical universities in Ghana, other factors may have a stronger impact on employees' task and citizenship performance. It is possible that factors such as employee skills and abilities, job design, organizational support, and work environment play a more crucial role in determining task and citizenship performance outcomes. Finally, the negative relationship between supervisor psychopathy and task and citizenship performance indicates that employees working under psychopathic supervisors are likely to experience difficulties in their tasks and may struggle to meet job objectives effectively and less likely to engage in citizenship behaviours.

Based on the results obtained from objective three, it is recommended that technical universities take measures to enhance the capabilities and knowledge of supervisors. This can be achieved by implementing leadership development and training programmes that concentrate on various aspects such as emotional intelligence, effective communication, collaboration, ethical leadership, and the significance of

empathy. By doing so, supervisors will be equipped with the necessary skills to optimise task performance and foster a positive and supportive leadership style that encourages prosocial behaviours among their teams.

It is crucial to be observant in recognising and confronting supervisors who have psychopathic characteristics, and to implement suitable actions in order to establish a work atmosphere that is both conducive and helpful.

It is important to thoroughly evaluate the leadership traits that are advocated and fostered in supervisors in order to effectively attain immediate performance objectives and ensure sustained organisational prosperity in the long run.

Establishing a culture characterised by trust, openness, and justice may effectively alleviate the detrimental impacts of psychopathic leadership and foster a workforce that is more productive and engaged.

One should strive to foster an organisational culture that places importance on and acknowledges the contributions made by employees that extend beyond their designated job responsibilities. The process of acknowledging and providing incentives for civic behaviours has the potential to inspire employees to actively participate in such actions, hence fostering a constructive and flourishing workplace atmosphere.

RQ 4: To what extent does the supervisor dark triad moderate the relationship between employee engagement and organisational outcomes in Technical universities in Ghana?

The fourth objective of the study was to assess the level at which the supervisor dark triad moderates the relationship between employee engagement and organisational outcomes. It was hypothesised that supervisor dark triad will moderate the relationship between employee engagement and organizational outcomes such that this relationship is weakened at high SDT than at low levels of SDT. The study observed no significant impact in this relationship ($\beta = -.041$, $t = -1.043$, $p = .297$). Thus, hypothesis five (H5) was not supported. In other words, SDT did not serve as a boundary condition for engaged employees influencing organisational performance. This means that the presence of dark triad traits in supervisors does not significantly influence the strength

or direction of the relationship between employee engagement and task and citizenship performance in these universities. In other words, the influence of employee engagement on task and citizenship performance remains consistent regardless of the presence or absence of Supervisor Dark Triad traits. This suggests that even if supervisors exhibit dark triad traits, the positive impact of employee engagement on organisational outcomes is not significantly affected. Organisations and for that matter technical universities must prioritize and foster employee engagement regardless of the characteristics of the supervisors.

RQ 5: Does ICT adoption mediate the relationship between employee engagement and organisational outcomes in Technical universities in Ghana?

Objective five of the study sought to ascertain if ICT adoption mediates the link between employee engagement and organisational outcomes. Three hypotheses were developed to guide the achievement of this objective. The initial proposition was that ICT adoption will mediate the relationship between employee engagement and organisational outcomes. The study findings suggest that ICT adoption partially mediates the relationship between employee engagement and organisational outcomes in Technical Universities in Ghana. This assertion was accepted by the study ($\beta=.861$, $t=23.848$, $p=.000$). This means that the presence of ICT adoption acts as a mechanism through which employee engagement influences organisational outcomes, but it does not fully explain the entire relationship. Secondly, the study assessed the mediating role of ICT adoption in the relationship between employee engagement and Task performance. It was hypothesised that ICT adoption will mediate that relationship. The result indicates a partial mediation of ICT adoption in the link between employee engagement and task performance ($\beta=.786$, $t=16.962$, $p\leq.001$). Finally, the study examined the mediating role of ICT adoption in the link between employee engagement and citizenship performance. It was hypothesised that ICT adoption will mediate the direct path. The result observed a partial mediation in the test such that the direct relationship was still significant ($\beta=.851$, $t=17.056$, $p\leq.001$). Thus, hypothesis six of the study which sought to observe the indirect impact of employee engagement on organisational performance was partially accepted.

The results suggest that the proficient use of information and communication technology has the potential to enhance the advantages derived from employees who are actively involved and committed. This implies that organisations that place importance on and allocate resources towards the use of information and communication technology (ICT) establish a conducive setting that facilitates enhanced productivity, efficiency, and collaboration among employees. Consequently, this results in improved task performance and the display of citizenship behaviours. Nevertheless, it is important to note that the adoption of Information and Communication Technology (ICT) is not the only determinant that impacts organisational outcomes. Employee involvement, in addition to the mediated relationship, also plays a significant role in directly impacting performance. This underscores the need of taking into account various elements while formulating strategies aimed at enhancing organisational outcomes at Technical Universities in Ghana.

RQ6: What is the recommended managerial framework to enhance employee engagement and organisational outcomes in Technical Universities in Ghana?

The final objective of this study is to propose a practical and detailed managerial framework that leverages ICT adoption and mitigates the negative impacts of supervisor Dark Triad traits on employee engagement and organizational outcomes. This framework, illustrated in Fig. 7.1, is tailored for technical universities in Ghana and integrates insights from leadership, organizational behavior, and technology management literature. The essential components of the framework are:

1. Leadership Development Programmes
2. ICT Integration and Support
3. Organizational Policies and Practices
4. Employee Support Systems
5. Performance Management Systems
6. Improvement of Organizational Outcomes through ICT and Employee Engagement

Detailed Guidelines for Implementation

Conduct a Comprehensive Study

The first step is for management to conduct a thorough assessment of current ICT use and employee engagement levels. This study should identify existing challenges, gaps, and opportunities. Based on this assessment, management should create a vision statement that emphasizes the importance of ICT adoption, active staff participation, and the impact on organizational objectives, including teaching, research, administrative tasks, and community engagement. This vision should be communicated to all stakeholders, including top executives, departmental heads, and staff members.

Cultivate Ethical Leadership

To reduce the impact of negative supervisor traits and promote ethical leadership, management should:

- Develop and execute training programs that focus on ethical decision-making, emotional intelligence, and self-awareness, helping leaders manage Dark Triad tendencies (Boateng, 2023).
- Conduct regular evaluations of leadership behavior to identify areas for improvement and provide constructive feedback (Steinert, Naismith, and Mann, 2012).
- Establish mentorship programs pairing experienced mentors with emerging leaders to foster ethical behavior and positive leadership traits.

Enhance Employee Engagement through ICT Integration

Effective ICT integration is crucial for enhancing employee engagement and performance. Management should:

- Conduct continuous training sessions on new and existing ICT tools to ensure employees are proficient and comfortable using them (Colbert, Yee, and George, 2016).
- Implement robust technical support systems to help employees optimize their use of ICT resources and resolve issues (Venkatesh et al., 2012).
- Develop e-learning modules to keep employees informed about technological advancements and encourage ongoing professional development.

Develop Organizational Policies and Practices

To cultivate a positive organizational culture, management should:

- Develop and enforce comprehensive ethical guidelines and codes of conduct to prevent unethical behaviors associated with Dark Triad traits (Forsyth, Banks, and McDaniel, 2012).
- Establish open communication channels for employees to report unethical behavior or concerns without fear of retaliation (Cabana and Kaptein, 2024).
- Regularly review organizational policies to ensure they align with ethical standards and address emerging challenges.

Implement Employee Support and Well-Being Programs

Management should offer support and well-being programs to promote a supportive work environment:

- Provide counseling services and wellness programs addressing both physical and mental health (Singh, 2015).
- Implement systems to recognize and reward positive behaviors and high performance, boosting employee morale and motivation (Kumari, Ali, and Abbas, 2021).
- Offer career development opportunities through workshops, training sessions, and mentorship programs.

Establish Performance Management Systems

Accurately measuring and managing employee performance is essential for the success of the framework. Management should:

- Use balanced scorecards to measure employee performance comprehensively, considering both task performance and citizenship behaviors (Taamneh, Alsaad, and Elrehail, 2018).
- Implement 360-degree feedback systems to gather diverse perspectives on employee performance, leading to more comprehensive evaluations (Aguinis and Burgi-Tian, 2023).
- Develop personalized growth and development plans based on performance reviews to address specific improvement areas.

Enhancing Organizational Outcomes through ICT and Employee Engagement

The core objective of this framework is to leverage ICT adoption and employee engagement to improve organizational performance. Management should:

- Develop initiatives aimed at increasing employee engagement, such as team-building activities, feedback mechanisms, and inclusive decision-making processes.
- Promote the use of ICT to streamline processes, improve communication, and enhance collaboration among staff.
- Foster a culture of continuous improvement where feedback is actively sought, and innovative solutions are implemented to address organizational challenges.

Implementation Strategies

To successfully implement the framework, management should:

- Secure commitment from top management to drive the implementation.
- Formulate a comprehensive communication strategy to ensure all employees are aware of the initiatives and their benefits.
- Implement help desks and hotlines to provide immediate support to employees experiencing technical difficulties.
- Allocate the necessary resources, including personnel, budget, and time, to facilitate the framework's implementation.

This managerial framework provides a structured approach to enhance employee engagement and organizational outcomes in Ghanaian technical universities through strategic ICT integration and ethical leadership practices.

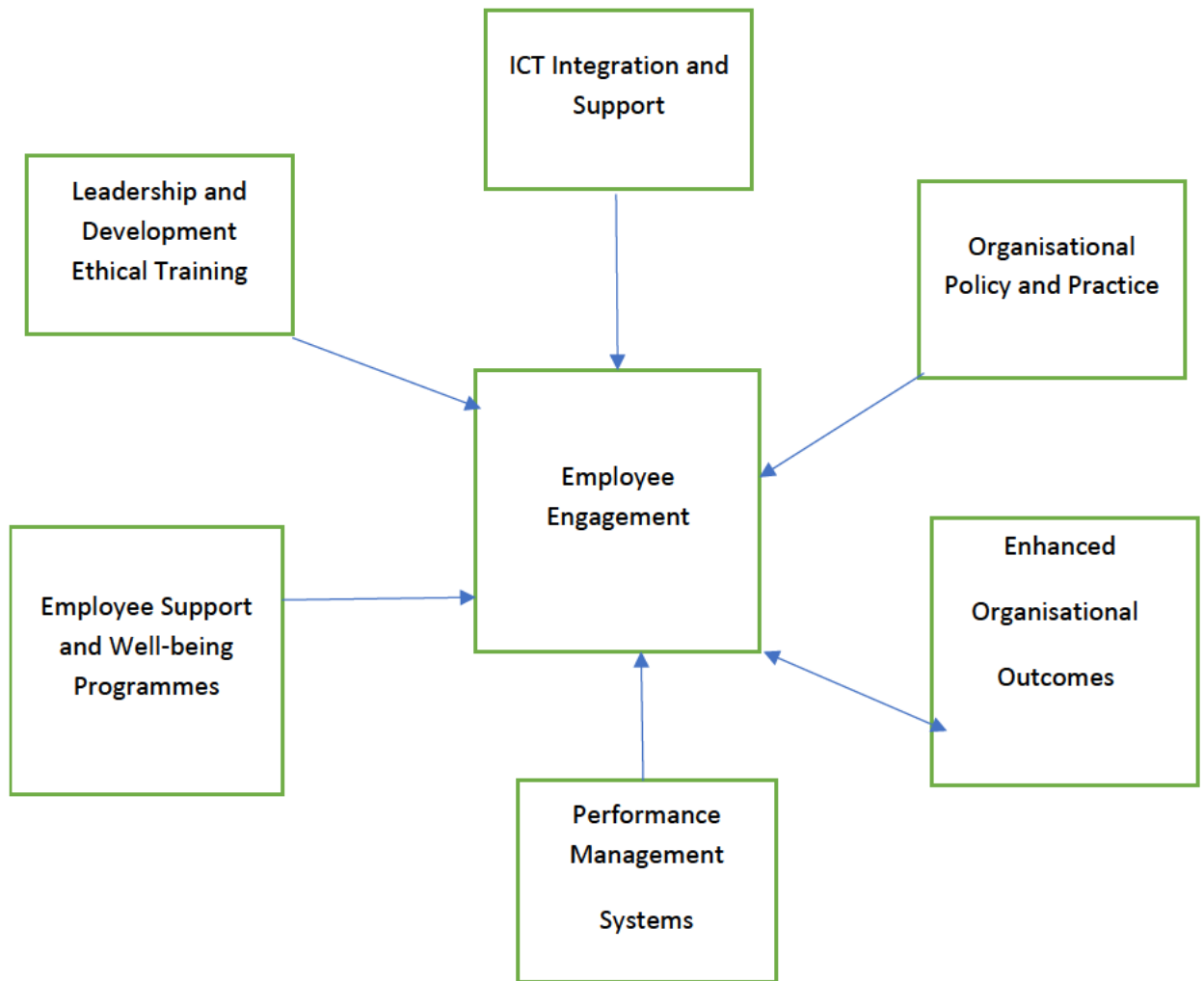


Fig 7.1 Managerial framework to improve ICT adoption and supervisor dark triad traits to enhance employee engagement and organisational outcomes at the Technical Universities in Ghana

7.3 Contribution of the Study

This study contributes to the employee engagement and organisational outcomes literature and the JD-R perspective in the following ways. First, the theoretical contribution is presented, followed by the practical contributions, methodological contribution and finally, policy contributions.

7.3.1 Theoretical contributions

In theory, this study enriches the JD-R theory, The Affective Events Theory and the Activation theory by providing empirical evidence on the effects of employee engagement on organisational outcomes in a varied level of dark triad traits situation of

leaders and ICT adoption, a topic that largely requires theoretical research (Rice, Taylor, and Forrester, 2020). Secondly, it extends and applies these theories in the context of higher-level education, specifically, Technical Universities where leadership positions are rotational among senior members of the staff.

This research contributes to the current knowledge of the boundary conditions for the effect of supervisor dark triad qualities on organisational results. The lack of evidence for the idea that supervisor dark triad qualities have a detrimental impact on organisational outcomes contributes to our knowledge of the function of supervisor traits in the workplace. It calls into question the idea that these characteristics have a significant detrimental influence on organisational performance and presents evidence that the setting of Ghana's technical universities may buffer such impacts. This study looked at ICT adoption as a mediating variable, which adds to our understanding of the mechanisms that link employee engagement to organizational outcomes. The study, once again, contributes to the body of knowledge and applies the underlying theories about the link between employee engagement and organizational success. Thus as regards the advancement of knowledge, the findings of this study make a modest contribution to the lacuna in the areas of Human Resource Management and Organizational Development.

7.3.2 Managerial Contributions

The outcomes of this study offer several potential practical lessons for managers to facilitate, support and improve managerial decisions, especially in the technical universities in Ghana. First, the findings of the study highlights the significant positive impact of employee engagement on ICT adoption, task performance, and citizenship performance. This emphasizes the importance for organizations, specifically technical universities in Ghana, to prioritise the development of positive connections, the promotion of teamwork, and the recognition of employee efforts. Managers should create an atmosphere where workers feel appreciated and inspired to engage in their job by building a supportive and collaborative culture.

Secondly, the finding that ICT adoption mediates the link between employee engagement and organisational outcomes shows that managers should aggressively promote and encourage the effective use of ICT technologies in the workplace. Management of technical universities in Ghana may accomplish this by investing in

ICT infrastructure. Again, managers should invest in ICT training and skill development programmes given the strong association between employee engagement and ICT adoption. Managers should keep abreast of emerging technology and trends relevant to the context of technical universities and should proactively discover chances to use novel ICT technologies that can further boost employee engagement and organisational outcomes by staying current with technology changes. Employees will be equipped with the information and skills needed to effectively embrace and use ICT technologies, resulting in enhanced performance outcomes.

Thirdly, the relationship between supervisor dark triad traits and organisational outcomes in technical universities is not supported by the study's findings, and this has practical implications for managers in the research context. This is in contrast to the substantial evidence of a negative effect of supervisor dark triad traits on organisational outcomes in other contexts. It implies that, in the context of Ghana's technical universities, the rotating leadership structure may provide checks and balances that mitigate the potential negative consequences of such characteristics. Managers should strive to display ethical and constructive leadership behaviours, build trust, and create a pleasant work environment that supports employee engagement and organisational success by exhibiting honesty, fairness, and transparency.

7.3.3 Methodological contribution

The research design employed in this study is explanatory or causal, enabling the examination of causal links between variables. The inclusion of this particular design decision in the study boosts its capacity to derive significant findings regarding the impact of employee engagement, ICT adoption, and supervisor dark triad qualities on organisational outcomes within technical universities in Ghana. Once more, the study showcases a rigorous methodological approach by including many theoretical views, namely the Job-Demands Resource theory, Affective event theory, and Activation theory. This integration allows for a comprehensive understanding of the intricate interactions being examined. This integration offers a complete and holistic methodology for examining employee engagement and its influence on organisational results. Furthermore, the inclusion of mediation and moderation analyses in the study enhances the methodological robustness of the research. Through an analysis of the mediating influence of information and communication technology (ICT) adoption and the moderating influence of supervisor dark triad qualities, this study contributes to our

comprehension of the fundamental processes and contextual limitations that impact employee engagement and organisational outcomes.

7.4 Recommendation of the Study

The purpose of the study was to examine the moderating role of Supervisor Dark Triad Trait and the mediating role of ICT adoption in the relationship between employee engagement and organizational outcomes in Ghanaian Technical Universities. The researcher makes the following recommendations based on the results:

- i. First, the outcome of the study indicates that employee engagement has a positive significant influence on organisational outcomes in the context of technical universities of Ghana and point to the significant role of employee engagement on organizational outcomes and so policymakers should pay close attention to institutional structures that foster the conditions needed for employee engagement or, alternatively, address problems that may impede it in order to improve the performance of technical universities in Ghana. It is therefore recommended that management create and implement strategies to increase employee engagement in Ghanaian technical universities, such as providing opportunities for skill development, fostering a positive work environment, and promoting employee recognition and rewards. Additionally management should include employee engagement as a key performance indicator in the performance evaluation process, which can help align individual and organisational goals and encourage a focus on increasing engagement levels.
- ii. The outcome further revealed a positive and highly significant relationship between employee engagement on ICT Adoption. Technical universities must recognize the significance of employee involvement in fostering ICT adoption, encourage a culture of continuous learning and provide training and resources to staff to increase their digital literacy and confidence in utilising ICT technologies. Again technical universities must create communication channels and platforms that enable workers to contribute their ideas, opinions, and suggestions on ICT adoption. This can lead to improved engagement and readiness to accept ICT solutions by instilling a sense of ownership and involvement.

- iii. Furthermore, research has shown that supervisors high in Dark Triad traits can have detrimental effects on employee well-being, job satisfaction, and organizational performance. However, the results from the data declined the assertion that SDT will negatively influence organizational outcomes (TP and CP) which also contradicts previous empirical findings (Huang, Su, Lin, and Lu, 2019; Rice, Taylor, and Forrester, 2020). It is therefore the recommendation of this study that technical universities highlight the significance of ethical leadership and implement policies and training programmes that encourage ethical behaviour, honesty, and transparency among managers and senior employees. Additionally it is recommended that the universities help supervisors and managers improve their leadership abilities and foster a pleasant work environment that supports excellent task performance and citizenship behaviour.
- iv. Fourth, while the study found no evidence of a moderator effect of the supervisor dark triad, it is critical to be attentive about the influence of negative supervisor qualities on employee engagement and organisational outcomes. It is recommended that the technical universities continues to encourage excellent leadership behaviours and give resources to help supervisors improve their leadership abilities.
- v. Lastly, the results of the study further show that ICT adoption partially mediates the link between employee engagement and organisational outcomes (TP and CP) in the technical universities in Ghana. This explains that although engaging employees could lead to increased performance, the adoption of ICT could serve as a mechanism through which enhanced performance could be attained. Therefore, this study recommends policy makers to develop policies that prioritise technology infrastructure investments in Ghana's technical universities; develop policies that promote and support comprehensive ICT training programmes for university employees; incorporating ICT adoption into performance evaluation procedures; establish policies mandating continuous monitoring and evaluation of ICT adoption initiatives and their influence on employee engagement and organisational outcomes; implement policies to promote employee collaboration and knowledge sharing. This can be accomplished by establishing online platforms, such as intranets or social

collaboration tools, on which employees can share ideas, resources, and best practices pertaining to ICT adoption.

7.5 Limitations and direction for future research

This research, like many others, has its limitations. Despite the enormous implications it has for theory, management practice, and methodology, this study still has some theoretical and methodological flaws. The limitations outlined below represent the flaws in the research design that have the potential to influence the findings and conclusions (Ross and Bibler Zaidi 2019:261).

Firstly, as contrasted to longitudinal analyses, the study was cross-sectional in character. Despite the use of a robust design to assess the causal association between variables, cross-sectional data does not attain the same degree of confidence as longitudinal analysis. It is suggested that future research employ a longitudinal designs that could provide a deeper comprehension of the interplay between employee engagement, ICT adoption, and organisational outcomes. Longitudinal designs would allow for the analysis of causal links as well as the dynamics and changes in these interactions across time.

Secondly, the generalizability of the study's findings may be limited beyond the context of technical universities in Ghana. The data for this study were gathered from respondents within a certain sector (education), resulting in a homogenous sample. The investigated relationships may not be immediately transferable to other sectors or organisational contexts due to the influence of cultural, structural, and contextual differences. Future study should conduct comparative research across different types of educational institutions, including the traditional universities, private universities and colleges, to determine if the findings are consistent across various contexts or if specific institutional characteristics influence the relationships observed in this study. Comparing data across contexts can shed light on the factors that impact the connections under consideration and reveal potential contextual differences.

Thirdly, the researcher used SPSS AMOS for structural equation modeling (SEM) in this study. While SPSS AMOS is a powerful tool, other software programs can offer more intuitive interfaces and advanced capabilities for SEM. These alternative

tools can make the analysis process more accessible and potentially reveal more detailed insights into the relationships among the variables. Future research should consider employing advanced covariate modeling techniques to explore the complex interactions among the variables. Utilizing user-friendly statistical software programs such as WarpPLS, SmartPLS, or Jamovi can facilitate this analysis.

Fourthly, this investigation is limited by the sample sizes and response rates of the universities that participated. It is essential to note, however, that response rates fluctuated across universities, which may affect the generalizability of the results. The different response rates imply that respondents' participation and engagement varied across universities. This disparity in response rates may introduce potential biases and restrict the generalizability of the results. Future research should aim for higher response rates across all universities in order to increase the robustness and generalizability of the findings. In addition, efforts can be made to comprehend and resolve the reasons for the low response rates at certain universities, which may provide insights for enhancing data collection strategies in future studies.

Fifthly, the study used self-report measures, which are susceptible to response biases such as social desirability and recollection bias. Participants may offer answers that they think to be positive, or they may not precisely recall previous events, possibly influencing the quality and dependability of the data obtained. For future research it is suggested that data is collected from many sources, such as supervisors, coworkers, and objective performance indicators to decrease typical technique bias and improve the validity of the findings. Multiple viewpoints can give a more thorough knowledge of the linkages while minimising biases associated with self-report measures.

Last but not the least, the dependence of the study on quantitative methodologies and a single data source (e.g., surveys) may restrict the depth of insight and neglect significant qualitative features of the connections studied. Combining several data collecting methods, such as interviews or observations, might result in a more comprehensive picture. It is therefore suggested that a mixed-methodologies research designs is used that integrate quantitative and qualitative data gathering methods. This would give a more thorough knowledge of the complex linkages and

enable for the investigation of the underlying processes and contextual factors that impact employee engagement, ICT adoption, and organisational results.

Despite the limitations, this study provides empirical evidence and conceptual insights that underscore the importance of employee engagement and ICT adoption as predictors of organizational outcomes.

7.6 Conclusion

This study has provided valuable insights into the complex interplay between employee engagement, ICT adoption, and supervisor Dark Triad traits within the context of Ghanaian technical universities. Drawing from the Job-Demands Resource theory, Affective event theory, and Activation theory, the study contributes to the existing literature by examining the role of information and communication technology (ICT) adoption as a mediator and supervisor dark triad traits as a moderator in this relationship.

The results of the study reveal significant positive relationships between employee engagement and both task and citizenship performance in the context of technical universities in Ghana. This finding underscores the importance of fostering a highly engaged workforce to enhance overall organizational productivity and the employees' willingness to go beyond their formal job duties to contribute positively to the university's success.

Additionally, the study confirms that ICT adoption plays a mediating role in the relationship between employee engagement and organizational outcomes. This suggests that the effective implementation and utilization of information and communication technology can further amplify the positive impact of employee engagement on task and citizenship performance. It highlights the need for technical universities in Ghana to invest in technology and provide the necessary training and support to employees to leverage ICT for improved performance outcomes.

On the other hand, the study does not find support for the hypothesized direct relationship between supervisor dark triad traits (Machiavellianism and narcissism) and organizational outcomes. However, it reveals a significant influence of supervisor

psychopathy on organizational outcomes. This highlights the importance of being attentive to negative traits in supervisors, especially psychopathy, as it can have detrimental effects on task and citizenship performance within the organization. Organizations should adopt appropriate measures to mitigate the negative impact of such traits on employee well-being and overall performance.

The contribution of the study to the literature lies in its examination of the context-specific relationships between employee engagement, ICT adoption, supervisor dark triad traits, and organizational outcomes in Ghanaian technical universities. By considering the unique characteristics and dynamics of this academic setting, the study offers practical implications for improving overall organizational effectiveness and employee well-being. The study emphasizes the importance of promoting employee engagement and incorporating technology to improve organizational performance. It also underscores the need for leaders and managers to be aware of and address negative supervisor traits, particularly psychopathy, to foster a supportive and ethical work environment.

In order to expand upon these discoveries, future studies should investigate advanced covariate modelling methods utilising user-friendly statistical software programmes such as WarpPLS, SmartPLS, or Jamovi. Longitudinal studies, comparative research across various educational institutions, and qualitative approaches like interviews and focus groups can offer more profound insights into these processes. Furthermore, doing research on the efficacy of ethical leadership interventions in reducing the adverse effects of supervisor Dark Triad qualities might contribute to our comprehension of how to foster favourable organisational results.

Finally, this study contributes significantly to the literature on employee engagement, ICT adoption, and supervisor Dark Triad traits by providing empirical evidence and conceptual insights specific to the context of Ghanaian technical universities. The proposed management framework offers practical guidelines for leaders and managers to enhance employee engagement and organizational performance through effective use of technology and ethical leadership practices. By addressing the recommendations for future research, scholars can further elucidate the mechanisms underlying these relationships and inform the development of more targeted and effective interventions.

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APPENDICES

APPENDIX A – 1a Exploratory Factor Analysis

Rotated Component Matrix^a

	Component				
	1	2	3	4	5
TP1	.865	-.018	-.028	-.124	-.013
TP2	.948	-.041	.008	-.064	.009
TP3	.752	.050	-.022	-.012	-.007
TP4	.919	.010	.013	-.043	-.039
TP5	.900	.000	-.027	-.032	-.004
CP1	.965	-.028	-.026	-.071	.005
CP2	.947	-.018	-.051	-.046	-.003
CP3	.836	-.082	-.015	-.098	.026
CP4	.940	-.015	-.016	-.101	.018
CP5	.968	-.038	-.025	-.075	.011
CP6	.927	-.001	-.034	-.019	-.021
CP7	.955	-.002	.001	-.065	-.002
CP8	.966	-.026	-.036	-.048	.013
MAC1	.047	-.043	.617	-.474	-.173
MAC2	.082	.000	.729	-.329	-.194
MAC3	-.102	.017	.748	-.070	-.050
MAC4	-.102	-.005	.846	-.148	-.106
PSY1	.009	-.027	.845	-.116	-.172
PSY2	.032	-.084	.813	-.242	-.038
PSY3	-.041	-.026	.808	-.263	-.149
PSY4	-.047	-.004	.828	-.110	.062
NAS1	-.079	-.019	.853	-.016	.168
NAS2	-.034	-.083	.842	.020	.168
NAS3	.040	-.070	.826	-.084	.175
NAS4	-.006	-.039	.848	-.135	.024
ICT1	-.134	.011	-.104	.866	.050

ICT2	-.139	.014	-.197	.847	-.024
ICT3	-.011	.057	-.021	.736	-.042
ICT4	-.104	.086	-.239	.872	-.032
ICT5	-.085	.048	-.269	.869	-.012
ICT6	-.076	.057	-.282	.834	-.021
ICT7	-.099	.065	-.214	.849	.008
ENG1	-.040	.774	-.033	.072	-.063
ENG2	-.019	.605	-.041	-.003	.238
ENG3	-.052	.887	-.015	.002	-.074
ENG4	.023	.912	-.011	.006	-.090
ENG5	-.034	.929	-.023	.068	.094
ENG6	.016	.911	-.018	.079	.100
ENG7	-.003	.885	-.044	.021	.111
ENG8	.014	.886	.013	.042	.078
ENG9	-.006	.812	.003	.039	.195
ENG10	-.005	.895	-.003	.027	-.044
ENG11	-.012	.875	-.075	.004	.027
ENG12	.001	.195	-.062	-.048	.849
ENG13	-.010	.919	-.053	.027	-.064
ENG14	-.026	.875	-.062	.015	-.116
ENG15	-.038	.901	-.030	.049	-.019

Extraction Method: Principal Component Analysis.

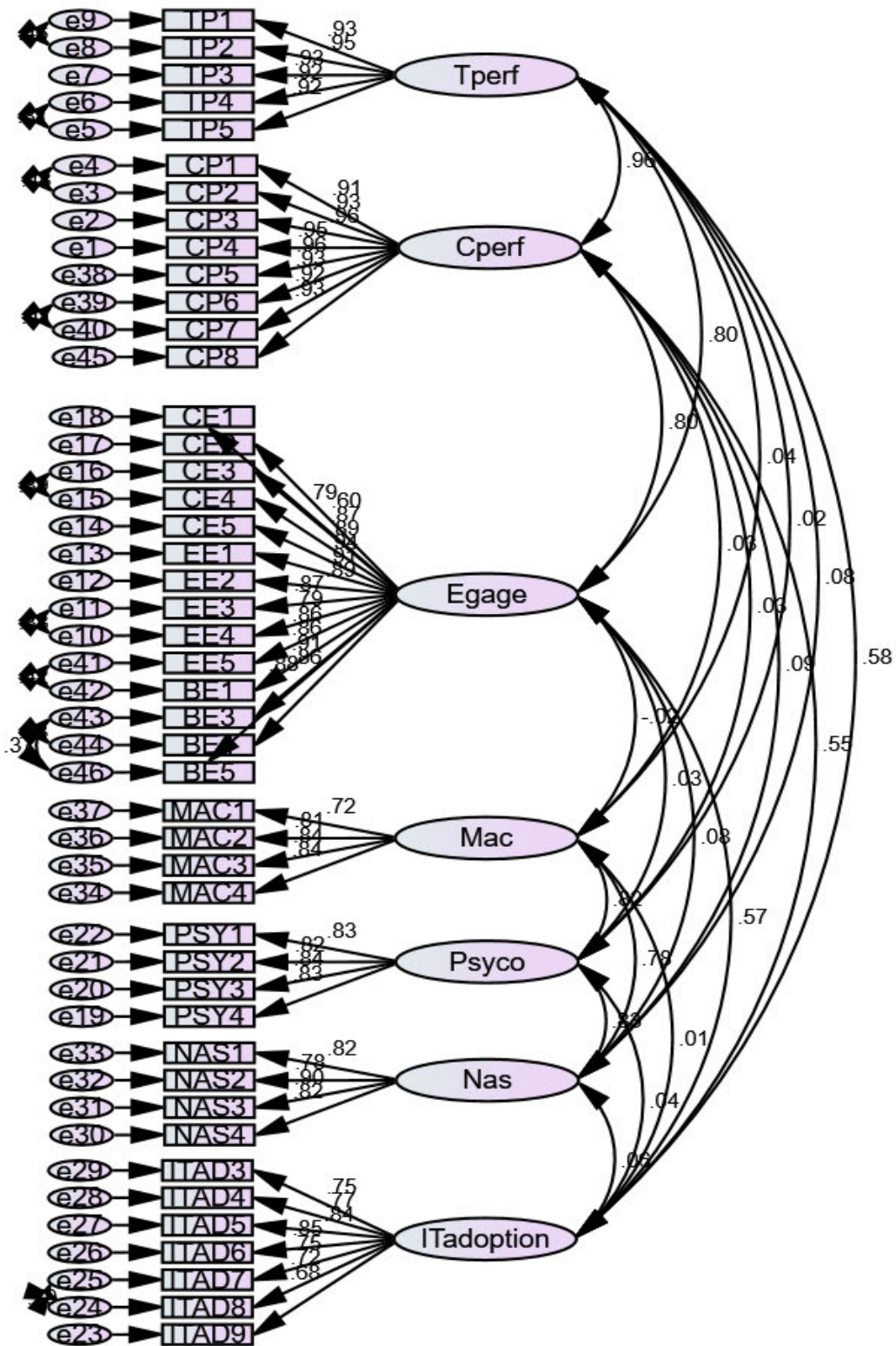
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

APPENDIX A – 1b **Regression Weights: (direct relationship)**

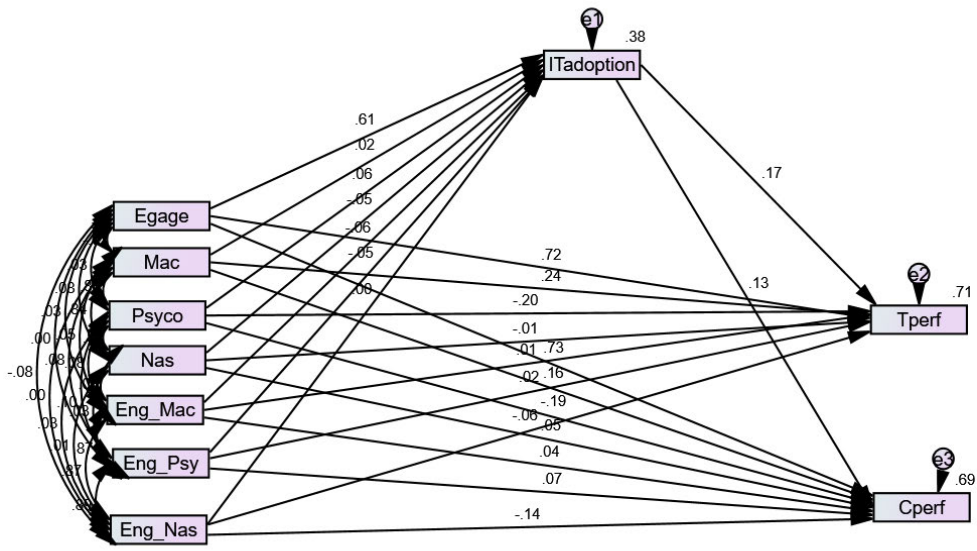
Relationships	Estimate	S.E.	C.R.	P	Label
ITadoption <--- Egage	.518	.041	12.589	***	
ITadoption <--- Nas	-.024	.119	-.200	.841	
ITadoption <--- Psyco	.026	.142	.185	.853	
ITadoption <--- Mac	.023	.122	.191	.849	
Tperf <--- Nas	-.026	.092	-.279	.780	
Tperf <--- ITadoption	.201	.046	4.344	***	
Tperf <--- Mac	.318	.094	3.382	***	
Tperf <--- Psyco	-.264	.110	-2.399	.016	
Tperf <--- Egage	.694	.040	17.432	***	
Cperf <--- Mac	.258	.106	2.444	.015	
Cperf <--- Psyco	-.250	.124	-2.025	.043	
Cperf <--- Egage	.772	.045	17.243	***	
Cperf <--- Nas	.028	.103	.275	.783	
Cperf <--- ITadoption	.167	.052	3.216	.001	

APPENDIX A – 1c: Final Measurement Model (CFA) Showing Standardised Loadings

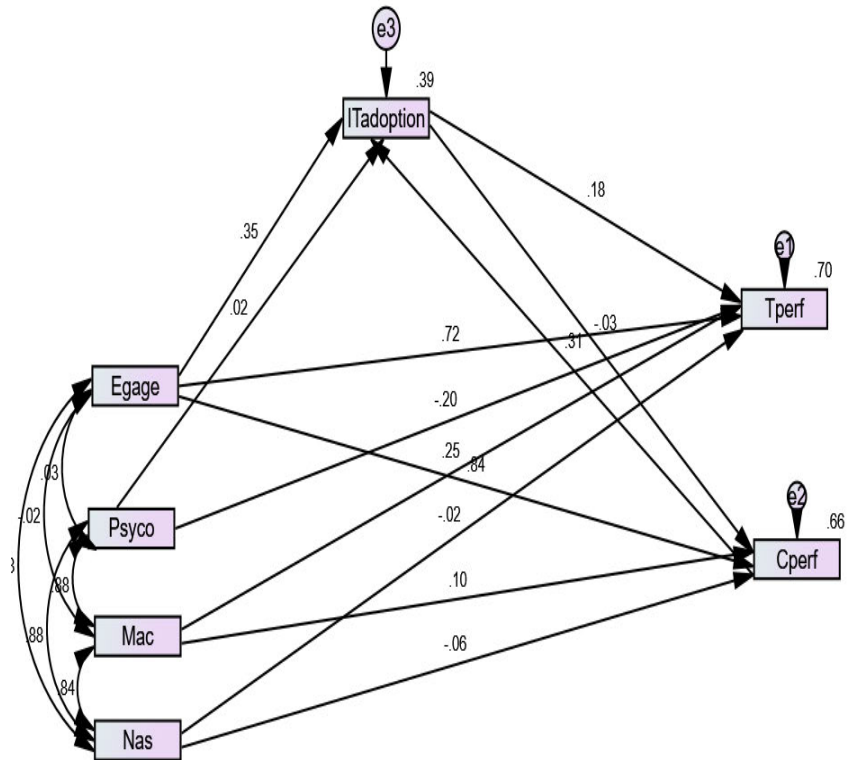


Source: SEM Analysis from Field Data 2023

APPENDIX A – 1d Structural Model for Direct Relationship



APPENDIX A – 1e Structural Model for Mediation



APPENDIX B-1: Research Questionnaire



Section A: Demographic Characteristics of Respondents

A1. Sex: a. Male [] b. Female []

A2. Age in years: _____

A3. Highest education qualification achieved: a. Diploma [] b. Bachelor's Degree []
c. Master's Degree [] d. Doctorate Degree [] d. Other (s) []

A4. How many years have you worked in your technical university? _____

Section B: Employee Engagement

Please indicate your agreement or disagreement to each of the following statements that relate to employee engagement in your technical university, by **ticking** the appropriate number on the scale: 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, and 5=strongly agree.

Employee Engagement						
CE01	I am really focused on my job when I am working.	1	2	3	4	5
CE02	I concentrate on my job when I am at work.	1	2	3	4	5
CE03	When working, I think a lot about how I can give my best.	1	2	3	4	5
CE04	At work, I am focused on my job.	1	2	3	4	5
CE05	When I am at work, I give my job a lot of attention.	1	2	3	4	5
EE06	Working at my current institution has a great deal of personal meaning to me	1	2	3	4	5
EE7	I feel a strong sense of belonging to my job	1	2	3	4	5
EE8	I am proud to tell others that I work for my current institution.	1	2	3	4	5

EE9	I believe in the mission and purpose of my institution.	1	2	3	4	5
EE10	I care about the future of my institution	1	2	3	4	5
BE11	I do more than is expected of me.	1	2	3	4	5
BE12	I really push myself to work beyond what is expected of me.	1	2	3	4	5
BE13	I am willing to put in extra effort without being asked.	1	2	3	4	5
BE14	I often go above what is expected of me to help my team be successful.	1	2	3	4	5
BE15	I work harder than expected to help my Institution succeed	1	2	3	4	5

Section C: Task performance

Please indicate your agreement or disagreement to each of the following statements that relate to employee engagement in your technical university, by **circling** the appropriate number on the scale: 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, and 5=strongly agree.

Task Performance						
TP01	My performance meets job objectives well.	1	2	3	4	5
TP02	I am happy with my overall job performance.	1	2	3	4	5
TP03	I meet performance standards to organisational level expectation.	1	2	3	4	5
TP04	I am happy with my technical competence.	1	2	3	4	5
TP05	I always meet specific job responsibilities.	1	2	3	4	5

Section D: Citizenship Performance

Please indicate your agreement or disagreement to each of the following statements that relate to employee engagement in your technical university, by **ticking** the appropriate number on the scale: 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, and 5=strongly agree.

Citizenship Performance						
CP01	At work, I do things to help others when it's not part of the job.	1	2	3	4	5
CP02	I willing help new staff get oriented towards the job	1	2	3	4	5

CP03	I don't take extra or long breaks while at work	1	2	3	4	5
CP04	My attendance at work is more often than usual	1	2	3	4	5
CP05	I keep myself updated with the university's announcements and memos	1	2	3	4	5
CP06	I always keep myself abreast of changes in the university.	1	2	3	4	5
CP07	I usually find fault with what the university is doing.	1	2	3	4	5
CP08	I always require a boost of motivation to get the work done	1	2	3	4	5

Section E: Supervisor Dark Triad Traits

In your own opinion, please indicate your agreement or disagreement to each of the following statements that describe the personality traits of your supervisor, by **circling** the appropriate number on the scale: 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, and 5=strongly agree.

Supervisor Dark Triad Traits						
MA01	My supervisor tends to manipulate me to get his/her way.	1	2	3	4	5
MA02	My supervisor uses deceit or lie to get his/her way.	1	2	3	4	5
MA03	My supervisor uses flattery to get his/her way.	1	2	3	4	5
MA04	My supervisor tends to exploit others towards his/her own end.	1	2	3	4	5
PS05	My supervisor tends to lack remorse.	1	2	3	4	5
PS06	My supervisor tends to be unconcerned with the morality of my actions.	1	2	3	4	5
PS07	My supervisor tends to be callous or insensitive.	1	2	3	4	5
PS08	My supervisor tends to be cynical.	1	2	3	4	5
NA09	My supervisor tends to want others to admire him/her.	1	2	3	4	5
NA10	My supervisor tends to want others to pay attention to him/her.	1	2	3	4	5
NA11	My supervisor tends to seek prestige or status.	1	2	3	4	5
NA12	My supervisor tends to expect special favours from others.	1	2	3	4	5

Section F: ICT Adoption

In your own opinion, please indicate your agreement or disagreement to each of the following statements that relate to your willingness to adopt ICT in delivering services, particularly in this era of Covid-19, by **ticking** the appropriate number on the scale: 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, and 5=strongly agree.

ICT Adoption						
ICT01	In delivery services, I am willing to allow students and other clients to locate and send information electronically to appropriate contacts within the university.	1	2	3	4	5
ICT02	I am willing to offer solutions to students and other clients' problems and allow them to track and inquire about their requests electronically.	1	2	3	4	5
ICT03	I am willing to accept queries, information seeking messages, and payments electronically from students and clients.	1	2	3	4	5
ICT04	I am willing to serve students' and other clients via online information.	1	2	3	4	5
ICT05	I am willing to provide information in response to students' questions and requests electronically.	1	2	3	4	5
ICT06	I am willing to provide regular updates to students and other clients about our services electronically.	1	2	3	4	5
ICT07	I am willing to provide clients with general information about the university via email, websites, whatsapp etc.	1	2	3	4	5

THANK YOU

Appendix C-1: Letter of Information



Title of the Research Study: The Role of Supervisor Dark Triad and ICT adoption on Employee Engagement and Organisational Outcomes in Ghanaian Technical Universities

Principal Investigator/s/researcher: Monica Dede Tekyi Ansah Yawson

Supervisor/s: Dr Njabulo Khumalo

Brief Introduction and Purpose of the Study: Good morning and trust you are doing well. My name is Monica Dede Tekyi Ansah Yawson, a lecturer at Takoradi Technical University and a Ph.D. student at the Durban University of Technology, South Africa. I am presently investigating on the role of supervisor Dark Triad and ICT adoption on employees' engagement and organisational outcomes and kindly invite you to voluntarily participate in this research.

Low level of engagement could weaken employees' ability to produce positive organisational outcomes, manifested in their task performance and willingness to be good organisational citizens. Leadership trait exhibited and ICT adoption, particularly in this era of Covid-19 where work systems have change to online working, could either combat or heighten this direct relationship.

With these issues in mind, this study seeks to assess the mediating roles of supervisor dark triad and ICT adoption on the relationship between employee engagement and organisational outcomes in Technical Universities of Ghana.

Outline of the Procedures: The questionnaire is an online structured questionnaire. When you receive the link, please click on it to access the title page of the questionnaire. After reading the information on the title, click on NEXT to access the questionnaire items ONLY if you agree to voluntarily take part in the research. After responding to

the items, click on Submit at the bottom of the final section of the questionnaire. Your responses are submitted automatically.

Please, be informed that the questionnaire precludes any item that will reveal your identity and that of your company. It will take about 15 minutes to complete this questionnaire. Kindly note that there are no right or wrong answers. I am only interested in your opinion. Since, it is an online questionnaire, you can respond any time and place you find it possible to do.

Responsibilities of Participant: Upon receipt of the permit from the gatekeepers from the various technical universities, individual staff both academic and non-academic will be contacted to seek their consent in writing to partake in the study.

Risks or Discomforts to the Participant: There are no foreseeable adverse reactions on the contributions that you will make to the study. The questionnaire items do not contain any statement that will require you to perform any acts or make statements which might be expected to cause discomfort, compromise you, diminish your self-esteem or cause you to experience embarrassment or regret.

Reason/s why the Participant May Be Withdrawn from the Study: Please, note that participating in this research is voluntary and you may withdraw from the study at any stage for your own personal reasons if you wish to do. There will be no adverse consequences should you choose to withdraw.

Benefits: There are no direct benefits to you for taking part in this study except that your opinion will add to existing knowledge and the outcome of the study. You will indirectly benefit through policy formulation and management support in Technical Universities in Ghana.

Remuneration: Please, note also that you will not remunerated for taking part in this research. This study is purely for academic purpose only and a partial requirement for the award of Ph.D. in Human Resource Management. Hence no remuneration is allocated for partaking in the research.

Costs of the Study: Please note that you are not expected to cover any costs towards the study except for the use of your internet data to answer the online questionnaire.

Confidentiality: The questionnaire precludes any item that will reveal your identity and the identity of your company. The biographical information required are sex, age group, range of length of service, and whether you are a managerial employee or not. These items generic and the outcomes cannot be attributed to any individual. You are assured of utmost anonymity and confidentiality.

Result: The results of this study will be disseminated in two ways. First, the outcome will be published in recommended journals. Second, the outcome will also be presented to the Technical Universities of Ghana.

Research-related Injury: There is no expected physical, psychological, or emotional injury to you for taking part in this research as you will not perform or do any physical acts that may warrant an injury in the course of the performance.

Storage of all electronic and hard copies including tape recordings: All data to be elicited from respondents will be electronic. Consequently, the data be stored electronically in Google Form and its security and confidentiality are guaranteed. Only the researcher will have access to the data until it is eventually disposed after five years.

Persons to Contact in the Event of Any Problems or Queries:

In the event of any problem or queries, kindly contact the following:

1. The researcher: Monica Dede Tekyi Ansah Yawson on +233-20- 8183503 or at monica.yawson@ttu.edu.gh,
2. The supervisor: Dr. Njabulo Khumalo on 0027 74 570 4941 or at Njabulok1@dut.ac.za
3. The Director: Research and Postgraduate Support: Dr. L. Linganiso on 0027 31 373 2577 or researchdirector@dut.ac.za.
4. The Institutional Research Ethics administrator on 0027 31 373 2900.

Appendix D-1: Letter of Consent



Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher, **Moinca Dede Tekyi Ansah Yawson**, about the nature, conduct, benefits and risks of this study
- Research Ethics Clearance Number: _____,
- I have also received, read and understood the above written information (Participant Letter of Information) regarding the study.
- I am aware that the results of the study, including personal details regarding my sex, age, date of birth, initials and diagnosis will be anonymously processed into a study report.
- In view of the requirements of research, I agree that the data collected during this study can be processed in a computerised system by the researcher.
- I may, at any stage, without prejudice, withdraw my consent and participation in the study.
- I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.
- I understand that significant new findings developed during the course of this research which may relate to my participation will be made available to me.

Mr Kenneth Stoff Boadi

25/02/2021

Full Name of Participant

Date

Signature / Right Thumbprint

I, Moinca Dede Tekyi Ansah Yawson herewith confirm that the above participant has been fully informed about the nature, conduct and risks of the above

Moinca Dede Tekyi Ansah Yawson

25/02/2021

–

Full Name of Researcher

Date

Signature

Appendix E-1: Gatekeepers' Letter



Department of Human Resource Management
Faculty of Management Sciences
Human Resource Management
South Africa

18th February 2021

The Registrar
Takoradi Technical University
Post office Box 256
Takoradi

Dear Sir

REQUEST FOR GATEKEEPER LETTER

I am Monica Dede Tekyi Ansah Yawson, a member of the teaching staff of Takoradi Technical University and a PhD student in the Faculty of Management Sciences, Durban University of Technology, South Africa. I am conducting a research project titled *"Employee Engagement and Organizational Outcomes: The Roles of Supervisor Dark Triad Trait and ICT Adoption in Ghanaian Technical Universities.*

As part of the requirement to be given full ethical clearance, I need to submit a gatekeeper permission letter to indicate I have been granted permission to collect primary data from the staff of the university. I therefore wish to request permission to conduct research at this university.

Please I am available to provide further clarification if any.

I count on your assistance.

Yours faithfully

Tekyi Ansah Yawson (Mrs)

0208183503

awodede2007@yahoo.com/ monica.yawson@ttu.edu.gh



Department of Human Resource Management
Faculty of Management Sciences
Durban University of Technology
South Africa

22nd July 2022

The Registrar
Accra Technical University
Post Office Box 561
Barnes Road
Accra

Dear Madam

REQUEST FOR GATEKEEPER PERMISSION

I am Monica Dede Tekyi Ansah Yawson, a member of the teaching staff of Takoradi Technical University and a PhD student in the Faculty of Management Sciences, Durban University of Technology, South Africa. I am conducting a research project titled *"Employee Engagement and Organizational Outcomes: The Roles of Supervisor Dark Triad Trait and ICT Adoption in Ghanaian Technical Universities.*

As part of the requirement to be given full ethical clearance, I need to submit a gatekeeper permission letter to indicate I have been granted permission to collect primary data from the staff of the university. I therefore wish to request permission to conduct research at this university.

Please I am available to provide further clarification if any.

I count on your assistance.

Yours faithfully

Monica Dede Tekyi Ansah Yawson (Mrs)
0208183503

monica.yawson@ttu.edu.gh/ awodede2007@yahoo.com



Department of Human Resource Management
Faculty of Management Sciences
Durban University of Technology
South Africa

22nd July 2022

The Registrar
Koforidua Technical University
Post Office Box KF - 981
Koforidua

Dear Sir

REQUEST FOR GATEKEEPER PERMISSION

I am Monica Dede Tekyi Ansah Yawson, a member of the teaching staff of Takoradi Technical University and a PhD student in the Faculty of Management Sciences, Durban University of Technology, South Africa. I am conducting a research project titled *"Employee Engagement and Organizational Outcomes: The Roles of Supervisor Dark Triad Trait and ICT Adoption in Ghanaian Technical Universities.*

As part of the requirement to be given full ethical clearance, I need to submit a gatekeeper permission letter to indicate I have been granted permission to collect primary data from the staff of the university. I therefore wish to request permission to conduct research at this university.

Please I am available to provide further clarification if any.

I count on your assistance.

Yours faithfully

Monica Dede Tekyi Ansah Yawson (Mrs)
0208183503
monica.yawson@ttu.edu.gh/ awodede2007@yahoo.com



Department of Human Resource Management
Faculty of Management Sciences
Durban University of Technology
South Africa

22nd July 2022

The Registrar
Cape Coast Technical University
Post Office Box DL 50
Cape Coast

Dear Sir

REQUEST FOR GATEKEEPER PERMISSION

I am Monica Dede Tekyi Ansah Yawson, a member of the teaching staff of Takoradi Technical University and a PhD student in the Faculty of Management Sciences, Durban University of Technology, South Africa. I am conducting a research project titled *"Employee Engagement and Organizational Outcomes: The Roles of Supervisor Dark Triad Trait and ICT Adoption in Ghanaian Technical Universities.*

As part of the requirement to be given full ethical clearance, I need to submit a gatekeeper permission letter to indicate I have been granted permission to collect primary data from the staff of the university. I therefore wish to request permission to conduct research at this university.

Please I am available to provide further clarification if any.

I count on your assistance.

Yours faithfully

Monica Dede Tekyi Ansah Yawson (Mrs)
0208183503
monica.yawson@ttu.edu.gh / awodede2007@yahoo.com



Department of Human Resource Management
Faculty of Management Sciences
Durban University of Technology
South Africa

22nd July 2022

The Registrar
Kumasi Technical University
Post Office Box 842
Kumasi

Dear Madam

REQUEST FOR GATEKEEPER PERMISSION

I am Monica Dede Tekyi Ansah Yawson, a member of the teaching staff of Takoradi Technical University and a PhD student in the Faculty of Management Sciences, Durban University of Technology, South Africa. I am conducting a research project titled *"Employee Engagement and Organizational Outcomes: The Roles of Supervisor Dark Triad Trait and ICT Adoption in Ghanaian Technical Universities.*

As part of the requirement to be given full ethical clearance, I need to submit a gatekeeper permission letter to indicate I have been granted permission to collect primary data from the staff of the university. I therefore wish to request permission to conduct research at this university.

Please I am available to provide further clarification if any.

I count on your assistance.

Yours faithfully

Monica Dede Tekyi Ansah Yawson (Mrs)
0208183503
monica.yawson@ttu.edu.gh/ awodede2007@yahoo.com

Appendix E-2: Gatekeeper's Permission

KUMASI TECHNICAL UNIVERSITY		
OFFICE OF THE REGISTRAR Tel. No: 03224 91128 Fax: 03220 22387 Email: registrar@kstu.edu.gh		P. O. Box KS 854 Kumasi - Ashanti, Ghana, West Africa
Our Ref: KsTU/ADM/456		5/08/2022



KOFORIDUA TECHNICAL UNIVERSITY

(OFFICE OF THE REGISTRAR)

P. O. Box KF 981,
Koforidua - E/R
Ghana, West Africa

Tel: (+233) 3420 24466 (+233) 3420 22890 (+233) 3420 24993
Email: registrar@ktu.edu.gh

Tel/Fax: (+233) 3422 93004
Website: www.ktu.edu.gh

Our Ref: KTU/RO/2022/83

Your Ref:

Date: 19TH AUGUST, 2022

Mrs. Monica Dede Tekyi Ansah Yawson
Takoradi Technical University
Takoradi

Tel: 0208183503

Dear Madam,

RE: REQUEST FOR GATEKEEPER PERMISSION TO CONDUCT RESEARCH

Your letter dated 22nd July, 2022 on the above subject matter refers, please.

Approval has been granted for you to conduct your PhD research titled "*Employee Engagement and Organizational Outcome*" *The Roles of Supervisor Dark Triad Trait and ICT Adoption in Ghanaian Technical Universities*" at the Koforidua Technical University (KTU).

The Directorate of Research and Innovation has been directed to assist you.

By a copy of this letter, the Director (Research Innovation) is being requested to assist you accordingly.

Yours faithfully

DR. N. A. MENSAH-LIVINGSTONE
REGISTRAR

Cc: Director (Research)

CAPE COAST TECHNICAL UNIVERSITY

(OFFICE OF THE REGISTRAR)

Tel: 0592774927/0209185158

Website: www.cctu.edu.gh

Email: registrar@cctu.edu.gh



P.O. BOX DL. 50

Cape Coast

Our Ref: CCTU/494/114

July 27, 2022

Mrs. Monica Dede Tekyi Ansah Yawson
Department of Human Resource Management
Faculty of Management Sciences
Durban University of Technology
South Africa

Dear Mrs. Yawson,

RE: REQUEST FOR GATEKEEPER PERMISSION TO CONDUCT RESEARCH

Your letter dated July 22, 2022 on the above-mentioned subject refers.

We wish to inform you that approval has been granted for you to collect data at Cape Coast Technical University (CCTU) on your Ph.D. thesis titled "**Employee Engagement and Organisational Outcomes: The Roles of Supervisor Dark Triad Trait and ICT Adoption in Ghanaian Technical Universities.**"

By a copy of this letter, the Director of Public Affairs is kindly informed to provide you the necessary assistance.

Thank you.

Yours faithfully,

Francis Narh Akrono (Ph.D.)
Registrar

cc: Director of Public Affairs



**TAKORADI
TECHNICAL
UNIVERSITY**

**DIRECTORATE OF CONSULAR
AND GENERAL SERVICES**

P. O. BOX 256, TAKORADI - GHANA
Website: www.ttu.edu.gh Email: info@ttu.edu.gh
Tel: +233 (0) 312 022 917 / +233 (0) 312 022 918

TTU/REG/INTRO/VOL.1/373

28th July, 2022

Mrs. Monica Dede Tekyi Ansah Yawson
Department of Human Resource Management
Faculty of Management Sciences
Durban University of Technology
South Africa

Dear Madam

RE: REQUEST FOR GATEKEEPER PERMISSION TO CONDUCT RESEARCH

Gatekeeper's permission is hereby granted for you to collect primary data from the staff of this University for your research project titled, '*Employee Engagement and Organisational Outcomes: The Roles of Supervisor Dark Triad Trait and ICT Adoption in Ghanaian Technical Universities*'. It has been noted that this research project forms part of the PhD programme you are currently pursuing at the Durban University of Technology, South Africa.

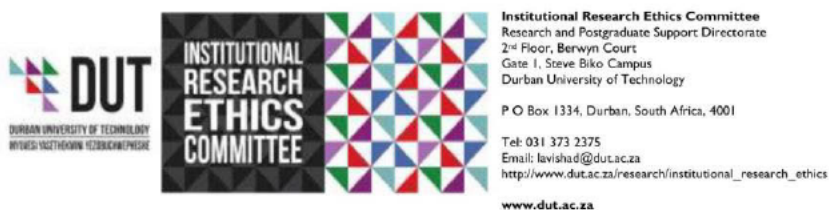
You are kindly entreated to ensure that ethical issues such as anonymity and confidentiality of data are considered and stated on your questionnaire before it is administered.

Thank you.

**KWARTENG AMANIAMPONG
(DIRECTOR)**

Copies: Registrar, Head (Directorate of Human Resource), Dean (Faculty of Business Studies)

Appendix F: Full Ethical Clearance



20 September 2022

Mrs M D T A Yawson
Post Office Box 256
Takoradi Technical University
Takoradi

Dear Mrs Yawson

Employee engagement and organisational outcomes: The roles of Supervisor Dark Triad and ICT adoption in Ghanaian Technical Universities
Ethical Clearance number IREC 076/22

The Institutional Research Ethics Committee acknowledges receipt of your final data collection tool for review.

We are pleased to inform you that the data collection tool has been approved. Kindly ensure that participants used for the pilot study are not part of the main study.

In addition, the DUT-IREC acknowledges receipt of your gatekeeper permission letters.

Please note that **FULL APPROVAL** is granted to your research proposal. You may proceed with data collection.

Any adverse events [serious or minor] which occur in connection with this study and/or which may alter its ethical consideration must be reported to the DUT-IREC according to the DUT-IREC Standard Operating Procedures (SOP's).

Please note that any deviations from the approved proposal require the approval of the DUT-IREC as outlined in the DUT-IREC SOP's.

Yours Sincerely

Prof J K Adam
Chairperson: IREC

Appendix G: Editor's Certificate

ETHEL ROSS

English language editing and proofreading

30 August 2023

To whomever it may concern:

This letter serves to confirm that I worked as the proofreader and language editor for

Monica Dede Tekyi Ansah Yawson's Ph.D. thesis:

The Roles of Supervisor Dark Triad Traits and ICT Adoption in
Employee Engagement and Organisational Outcomes in
Ghanaian Technical Universities

In no way did I change the content.

Yours faithfully

Ethel Ross (BA Hons; H Dip Ed)

Email: clanross1@icon.co.za Tel: 083 954 5412

Appendix H: Turnitin Report

THE ROLES OF SUPERVISOR DARK TRIAD TRAITS AND ICT ADOPTION ON EMPLOYEE ENGAGEMENT AND ORGANIZATIONAL OUTCOMES IN GHANAIAN TECHNICAL UNIVERSITIES

ORIGINALITY REPORT

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6	Joseph F. Hair, G. Tomas M. Hult, Christian M. Ringle, Marko Sarstedt, Nicholas P. Danks, Soumya Ray. "Partial Least Squares Structural	<1%

Supervisor 13/11/2023

Co-Supervisor 13/11/2023