



**SUSTAINABLE CONSTRUCTION THROUGH THE
IMPLEMENTATION OF POST-OCCUPANCY EVALUATION
PRACTICES: A CASE STUDY OF RDP BUILDINGS IN
MPUMALANGA.**

by

NKUTHALO JOHN-JUNIOR SIMELANE

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SUPERVISOR: DR M. MEWOMO

CO-SUPERVISOR: DR C. OKORAFOR

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Declaration

I, Nkuthalo John-Junior Simelane, certify that the dissertation's intellectual content is entirely my work except for the references and bibliographies cited. This research work, in whole or in part, has not been submitted to any other university for a degree, publication, or any other purpose.

Submitted by

Name: Nkuthalo John-Junior Simelane

Signed:

Date:14/03/2024.....

Supervisor: Dr MC Mewomo

Date: 06.04.2024.....

Co-Supervisor: Dr C. Okorafor

8/4/2024
Date:

HOD: Prof MS Ramabodu

Date: ..08/04/2024.....

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Dedication

I humbly dedicate this study to the divine presence of God Almighty, who has been my unwavering protector and guide throughout the entire process, from its inception to its completion. Additionally, I extend my heartfelt dedication to the esteemed Benguni clan, whose unwavering support and unity have made me feel an integral part of the family. May God bless every one of you.

Abstract

Reconstruction and Development Programme (RDP) buildings in South Africa were promulgated to alleviate poverty and provide better social services for previously disadvantaged South Africans by allocating tax money for development projects. However, there is a growing concern about the quality of housing developed under the RDP programmes. Post-occupancy evaluation is one of the measures that has been proposed to ensure the quality of these buildings is well understood and improved upon. The study sought to investigate the current status of post-occupancy evaluation (POE), understand the barriers to effective implementation of POE, and investigate the critical success factors and the benefits of POE in Mpumalanga Province, South Africa. To achieve this objective, the study adopted a quantitative approach utilising a questionnaire survey to expedite the collection of data, which was then analysed descriptively and inferentially. The study population was purposively selected due to the specific nature of the data collected. Professionals employed by the Department of Human Settlement in Mpumalanga and involved in the construction of the RDP building in Mpumalanga province provided the data. The findings indicate that the critical success factors for effective implementation of post-occupancy evaluation are: participation and commitment; leadership; education and skills; benchmarks and indicators; top management support; availability of resources; POE information management; and effective feedback. With respect to barriers that affect the effective implementation of the POE, the study identified the following: lack of adequate resources; lack of knowledge of POE procedures; lack of awareness of POE; lack of top management support; lack of coordination by departments; lack of owner's knowledge of POE and benefits; and POE is not integrated into the scope of work of the facility department. The study posited that POE could provide the basis for necessary changes, help increase design know-how, determine building defects, increase building performance, reduce maintenance costs, and increase occupants' satisfaction.

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List of Acronyms

CIBD	Construction Industry Development Board
POE	Post-occupancy Evaluation
RDP	Reconstruction and Development Programme
IDP	Integrated Development Plan
NHBRC	National Home Builders Registration Council
PPPFA	Preferential Procurement Policy Framework Act
MFMA	Municipal Finance Management Act
DA	Democratic Alliance
GNU	Government of National Unity's
SAP's	Structural Adjustment Programmes
NGDS	The National Growth and Development Strategy
GEAR	The Growth, Employment, and Redistribution Strategy
CIDB	Construction Industry Development Board
IREC	Institutional Research Ethics Committee

Chapter 1

Introduction

1.1 Introduction

This study focuses on the post-occupancy evaluation of Reconstruction and Development Programme (RDP) housing in Mpumalanga Province. Central to the study are the occupants' candid views on the Reconstruction and Development Programme (RDP) housing from the point of view of the end-user. To achieve this, the study is organised as follows: The background is followed by a problem statement that outlines the gap in this research. This, in turn, was followed by the research aims and objectives. The literature review which followed, delved into the process and importance of post-occupancy evaluation in the context of the reconstruction and development programme evaluation. Finally, the chapter's outline and references are provided.

1.2 Background and problem statement

With increasing globalisation and population growth worldwide, attention is turning to the significant role buildings play in contributing to harmful emissions into the environment (Kashyap, Iyer-Raniga and Francis 2017). In addition to reducing building emissions, climate sustainability of new and existing buildings is also critical for mitigating climate change effects on the built environment, particularly in urban areas (Shika 2012 cited in Ziama and Li, 2018). As a result, the incorporation of renewable and sustainable features in the built environment has become one of the major areas of research for policymakers and the design community, including building operators. Evidence shows there is a lack of connection between the building users' outlook, how buildings are operated and managed, and the appropriate techniques for evaluating building performance (Hashim 2011 cited in Yaman et al (2021).

RDP buildings in the Mpumalanga area of South Africa were promulgated to alleviate poverty and provide better social services for previously disadvantaged South Africans by allocating tax money for development projects (Government Gazette, 1994). The projects included the provision of houses, popularly known as the reconstruction development programmes (RDPs). In this programme, the government constructs low-cost housing and reconstructs of existing buildings for poor South Africans with a combined income of R3500 or less (Nokulunga, Didi

and Clinton 2018; Smit 2016). The local government has the task of providing such accommodation to the poor through the inclusion of housing provisions in their Integrated Development Plan (IDP). The IDP is a framework for managing, planning, budgeting, implementation, reporting, monitoring, and evaluation of local government development programmes (National Treasury, 2023).

The aim of the IDP through RDP houses is to provide houses for those without any houses. As a result, RDP houses are an advantageous method to deal with urban housing problems as well as programmes for rural development. This is so, because together with the house, tap water, roads, garbage collection and other social infrastructure are provided (Christopher and Nwankwo,2021). However, concerns were raised over the housing structures provided. According to Greyling (2017), RDP houses built pre-1997 were not up to standards; most houses had construction problems, loose and leaking roofs, doors and windows improperly fitted, and visible cracks. In addition, in many settlements, houses had no toilets or bathrooms incorporated into the building (Housing Portfolio Committee Report 2001). As such, the sustainability of RDP houses is questionable. In another study, Cewuka (2016) acknowledges that while the government has done well in providing the housing target of 1994, the quality, cost-effectiveness, and sustainability of these buildings have not been checked. This has brought into focus the status of RDP houses by incorporating post-occupancy evaluation (POE).

In the construction industry, standards need to be complied with for any project, private or public. Such standards include policies such as the Housing Act of 1997 and the National Home Builders Registration Council (NHBRC). The Housing Act defines the role of local, provincial and national governments in housing development aiming to provide and aid the sustainable housing development process. It has a set of general principles applicable to housing development across all spheres of government (The Housing Act, 1997). The National Home Builders Registration Council (NHBRC) is a regulatory body formulated in 1997 for the home building industry to protect homeowners from contractors who deliver housing units of sub-standard design, workmanship, and poor-quality material. If there are complaints about low-standard RDP houses despite the above standards, questions arise about compliance with standards and sustainability of the building materials used.

The technological material used in RDP houses has been the subject of several contestations among construction studies. A building is its material. If the material is poor, the building quality will also be poor. According to Mashwama, Thwala and Aigbavboa (2019), the material used for constructing RDP houses is usually of poor quality. Their reports further indicated that roofs, walls, doors, floors, and windows are mostly of poor standard, as most are reported to be crumbling, pulling off, or breaking without any external influence due to poor material and workmanship. The foregoing background provided revealed incessant reports of poor methods, non-compliance with standards and poor materials used to build RDP houses. In this vein, it can be concluded that the industry does not usually focus on design intent for sustainability; rarely do studies undertake post-occupancy evaluations to understand whether design intent has been met.

Post-occupancy evaluation (POE) is a practice that helps construction companies and designers gather key feedback from the product's end-user (Sanchez, Christine and De Paula, 2020). This helps improve previous weaknesses or design flaws and, in the end, provides the occupants with a better dwelling (Boissonneault and Peters, 2023). POE is regarded as the process in which an evaluation assesses the degree to which the building meets its occupants' needs. This process is undertaken months after the occupants have moved in and made use of the building (Preiser, White and Rabinowitz (2015) cited in Ratnasari and Sudradjat, 2023). This process ensures that there is constant development in design and construction to meet the needs of the occupants. Evaluating the performance of buildings should be considered an iterative process that is ongoing and extends t

o the upgrade and refurbishment of buildings (Kashyap, et al. 2017). Various research studies have opined that one way to monitor building operations is through POE. It is with this understanding that the study aimed to investigate POE practices, especially those delivered through RDP in Mpumalanga Province.

1.3 Research aim and objectives.

The study aims to develop guidelines for sustainable buildings through an effective post-occupancy evaluation (POE) practice to improve POE practices in the study area.

1.4 Objectives

The objectives formulated for this study are as follows:

1. To assess the current awareness of POE practices in Mpumalanga, South Africa.
2. To investigate the barriers influencing the implementation of POE practices for building sustainability in Mpumalanga, South Africa.
3. To investigate the critical success factors for the effective implementation of POE in Mpumalanga, South Africa.
4. To determine the benefits of implementing POE practices for the sustainability of buildings in Mpumalanga, South Africa.

1.5 Significance of the Study

The study is important as it creates awareness of the importance of conducting post-occupancy evaluations of state-provided buildings. The study will make it possible to understand the challenges that have been impacting POEs in Mpumalanga Province from a public official's perspective. The study's significance is that it provides an empirically grounded understanding of the critical success factors or the environment that enables the effective implementation of POEs on RDP housing. Li, Froese and Brager (2018) postulate that most studies about POE were conducted in Europe and North America. A small number of studies were conducted in the Arabian Gulf region with most of them focusing on residential buildings, and no study has been found specifically addressing governmental buildings. This shows that there is a knowledge gap that needs to be filled with regard to government building.

1.6 Limitations of the Study

The study was limited to public officials in Mpumalanga Province. The study's scope focused only on officials in Mpumalanga Province, to get a deeper understanding of their post-occupancy evaluations within the province. Although only incorporating public officials can be seen as a limitation of this study, it enabled the researcher to focus on getting a deeper understanding from the perspective of government officials. The researcher incorporated the total population of those officials tasked with post-occupancy evaluation Mpumalanga Province.

1.7 Research Methodology

The study took a quantitative approach and used a closed-ended questionnaire. The total population of the study was 85, and 80 participants responded to the questionnaire. A total-population sampling technique was chosen because of the number of participants and the effectiveness of a questionnaire on such a smaller target population. The data in this study was thematically analysed by identifying diverging and merging themes derived from the objectives.

1.8 Chapter outline

This section provides a brief review of the structure of the thesis. The thesis is organised into five chapters, as illustrated below:

Chapter 1: Introduction and Background

This chapter focuses on the introduction to the topic under study. Included in the chapter are the problem statement, research aim, and objectives, including the research methodology.

Chapter 2: Literature Review: Theoretical Framework

This chapter explores the in-depth method for RDP procurement for the whole supply chain, the standards, and ultimately the technology and material used.

Chapter 3: Research Methodology

This chapter present the methodology to be used to empirically examine the propositions outlined. This methodology comprises an overview of the research design, the sampling method, the instruments to be used and the data analysis methods. Included in the chapter is a discussion of the reliability and validity of the instruments, ethical considerations and anticipated field problems.

Chapter 4: Presentation of Results

This chapter presents the results of the empirical investigation based on the knowledge gained from chapters 2 and 3, through observations, document studies and the questionnaire.

Chapter 5: Discussions of Findings

This chapter discusses and interprets the findings from the analyzed data on the investigation of the methods, standards and technology used in RDP housing development.

Chapter 6: Conclusions and Recommendations

This chapter will address the appropriate recommendations and conclusions based on the findings that satisfied the aims and objectives of the study.

1.9 Conclusion

This study investigates the post-occupancy evaluations of the RDP housing in Mpumalanga Province, by comparing the intended outcomes of the RDP housing project against the end user's honest reviews after occupying the residences. Importance will be placed on the technology and materials used in building RDP houses. To achieve this, a problem statement was provided outlining the methodology, standards and technology gaps post-occupation of the RDP houses. As such, this chapter provided the aims of the study which will seek to investigate the level of satisfaction of the occupants post-occupation in the RDP houses, assess the challenges faced by the residents post-occupancy, mitigate the challenges face by the residents during post-occupancy of the RDP houses and proffer solutions on how to improve service delivery for future RDP projects. Finally, a brief methodology of the study was provided, outlining the research design, population and sampling, and data collection instruments.

Chapter 2

Literature Review

2. Introduction

This section reviews the literature on the methods for Reconstruction and Development Programme (RDP) tenders. The chapter provides the legislative framework that is used in the governance of housing in South Africa. The chapter further looks at the methods for RDP housing tenders, standards required in construction, RDP housing projects, housing in South Africa, and the challenges faced in RDP housing projects.

2.1 Legislative Framework

The Housing Act (RSA, 1997) acknowledges the importance of sustainability in the development of houses. The Act serves to provide for and aid the sustainable housing development process and has a set of general principles applicable to housing development within all spheres of government. It also defines the role of local, provincial, and national governments in housing development (The Housing Act, 1997). Section 2(c) of the General Principles of the Housing Act (RSA, 1997) states that “national, provincial and local spheres of government must- (a) ensure that housing development- (i) provides as wide a choice of housing and tenure options as is reasonably possible”. In a nutshell, this law makes provision for the houses to be sustainable, meaning that the method for tenders needs to be ethical and obliges the use of better material and technology and to meet the specified standards. The following section provides an analysis of such a process in the RDP.

2.2 Methods for RDP Housing Tenders

This section looks at how contractors are selected for RDP projects. A tender is a proposal submitted by the contractor to the government on how they are going to achieve the housing scheme as a company or corporation (Nokulunga, Didi and Clinton 2018). The construction of the RDP houses is done through the appointment of a contractor through the public tender system and processes (Mashwama, Thwala and Aigbavboa 2019). This is because the government states that all its entities should adhere to five principles when wanting to procure goods or services. The principles direct that the process must be fair, equitable, transparent,

competitive and cost-effective, as stated in the Constitution of the Republic of South Africa, 1996, Section 217. The Preferential Procurement Policy Framework Act 5 of 2000 (PPFA) paved the way for the inclusion of previously disadvantaged groups while the Local Government: Municipal Systems Act 32 of 2000 and the Municipal Finance Management Act 56 of 2003 (MFMA) regulate the tender processes at the local level. Thus, the method for tendering is open to the public. Government entities publicly advertise the tender and allow eligible contractors to bid for the contract. The main purpose is to give credibility to contractors by grading projects that they have worked on by their net contract cost. This agency promotes, amongst other things, uniformity in construction procurement, efficient and effective infrastructure delivery, and skills development. The contractor's financial books are assessed to establish their financial capability. Their best annual turnover and available capital are considered, and contractors are then given a grade between two and nine, nine being the best grade (CIDB 2015).

According to Smit (2016), these bids are assessed by the supply chain management and the bid that is considered the best value is chosen. This, however, does not necessarily mean the lowest bidder will be selected. The downfall of this process is that less credible contractors can bid as well, and if selected, this could lead to incomplete or unsatisfactory work (Rooyen 2020). For instance, Greyling (2017) concluded in his study that inexperienced contractors, including those contractors with previously incomplete contracts are willing to bid for RDP housing tenders. In this case, the method for tendering becomes problematic for achieving the intended objectives. Although there are standard regulators, such as the CIDB and NHBRC, the process is tainted by the initial method of contractor selection. Hence the need for this study to investigate the post-occupant evaluations of the RDP housing by comparing the intended outcomes of the RDP housing project against the end user's honest reviews after occupying the residences, given that very few studies have been carried out on the subject under study. Inspectors of the tenders should investigate if the construction companies meet the specifications to avoid sub-standard housing.

2.3 Standards for Construction

However, in the case of RDP construction, the regulatory board is not utilised. Only projects commissioned by the private sector with a value of greater than ten million rand or two hundred thousand rand in the public sector are required to apply to the CIDB. This thus excludes RDP housing, as an individual forty-square-metre house tends to cost less than one hundred and twenty thousand rand (Mguli 2016). The RDP housing projects are left out of such an important authority in standards. Mashwama, et al. (2019) point out that there is perpetual poor workmanship in RDP housing construction issues that CIDB standards could have easily solved.

In the case of RDP houses and all other homes, the regulatory board that is in charge of regulating and inspecting the quality of work is the National Home Builders Registration Council (NHBRC). This board is set out to protect home buyers from builders who construct sub-standard houses or ones who use poor workmanship and low-quality materials (NHBRC 2020).

Builders constructing homes are required to register and annually renew their membership with the NHBRC in accordance with the Housing Consumers Protection Measures Act, 1998 (Act No. 95 of 1998). Under this act, prospective homes are to be registered with the NHBRC at least 15 days before construction begins (NHBRC 2020). The NHBRC quality inspectors then visit the site during critical construction stages to ensure that no structural failure will occur within five years of completion (Human 2018). But even with this act and regulatory board in place, sub-standard, unsustainable RDP houses are still a common case in South Africa. The fixing of these houses is a further cost for the government and, at times, costs three times the value of the RDP house (Ana 2015). In a presentation, the Democratic Alliance (DA) party stated that eighty million rand was spent in the Free State to fix two hundred and four houses (Ana 2015). In these cases, the regulators and standards for home construction are still inadequate. RDP houses are still sub-standard, an exhibition of challenges facing the sustainable construction of RDP houses in such a way that the technology and material used in RDP houses are severely insufficient or rather inadequate.

Lack of good housing amenities can be detrimental to the overall well-being of a person, and is therefore a key social determinant of health. Post-occupancy evaluation (POE) is defined as the examination of the effectiveness of human users in occupied, designed environments (Li, Froese and Brager 2018). POEs generally focus on a single type of designed setting, tend to describe rather than manipulate, and are usually aimed at application. Within this wide focus, POEs vary considerably, and three conceptual dimensions-generality, breadth of focus, and applicability-are useful in cataloguing them. Li, Froese and Brager (2018) define post-occupancy evaluation as a process of evaluating the performance of a building after it has been occupied for several years.

The Reconstruction and Development Programme (RDP) is the Government of National Unity's (GNU) major policy initiative and also a socioeconomic framework that attempts to integrate development, reconstruction, redistribution, and reconciliation into a unified programme.

2.4 Housing in the Globe

Most studies have shown that there is an acute shortage of proper housing amenities globally, with the situation worsening in Africa, particularly in South Africa. This inadequacy of poor housing delivery is attributed to poor policies by the government, poverty, population growth and a high unemployment rate. It was established by the UN-Habitat (2000) that, as a result of these shortages, 43% of urban dwellers are living in slums and informal settlements in developing countries. Illegal settlements have an adverse impact on the environment, such as flooding and soil degradation as a result of overpopulation.

The problem of housing has been addressed using several measures in industrialised nations as a result of billions of people who are homeless and living in overcrowded shelters, as well as shanty-prepared homes. Some of these measures, such as housing subsidies, tax breaks, and mortgages, make it easier to start receiving housing assistance. Prior to 1980, the government's attempts to use self-help housing schemes failed owing to impoverished people's low-income levels. As a result, there was a shift towards privatising housing provision, encouraging the involvement of private market actors in the process.

The policy environment in the Western world demonstrates that European countries have gone a step further to reaffirm and pledge greater commitment to housing provision by developing

continent-bound legislation such as the Revised European Social Charter of 1996 (Article 31) and the Charter of Fundamental Rights of 2000. (Fredrickson and Patari 2006). The objective of such legislation is to enhance access to housing for all and promote mechanisms that pursue this objective. Tsenkova (2008) cited in Litynski (2021) notes that, apart from legislation, these countries are working within a framework of urban renewal and regeneration, which includes redeveloping urban areas.

According to Mutume (2004), African countries' housing policies have been a landmark sorrow owing to a lack of finances and bad administration of these housing programmes. Plans are being developed for nations such as Nigeria to maximise the use of home mortgages as a means of delivering housing. The country is making use of "traditional methods" to provide housing that involve the sale of land and the buyer building the house. These facilities carry the risk of acquiring the land without any subsequent construction occurring. This is because not everyone can afford to maintain the land and build houses for themselves (Moore, 2019).

According to Keivani and Werna (2001), housing provision in most developing countries has been controlled by the so-called Structural Adjustment Programmes (SAPs) designed by the World Bank in the 1980s and 1990s for economic growth and development. These policies were intended to help developing nations structurally adapt their economies and markets by enabling the privatisation of services or limiting government responsibility for most social services in order to enhance efficiency and profitability. The World Bank predicted a future breakdown of governance as a result of the public sector's extensive supply of services at the expense of the private sector.

2.5 Housing in South Africa

The initiative by the government of South Africa to provide housing for the homeless and the less privileged to reduce poverty and raise the standards of living proved to be a huge challenge to the government as revealed by the Department of Housing (2004). It was designed to start a process of rebuilding, transformation, redistribution, and growth to end the previous oppressive apartheid policies (Republic of South Africa, 1994; Bendix 2010).

The previous oppressive apartheid policies were used as a weapon to exploit and deny the majority of black people. The majority of South Africans were not served by the national strategy. Social security benefits and state maintenance grants did not envisage the growth and

security of black South Africans, but rather they assured the white population security in terms of welfare and access to basic needs and services. The Native Land Act of 1913 discouraged the socio-economic progress of the local South Africans and provided for the division of the population into four categories blacks, Indians, coloured and whites (Nicholas, Rautenbach and Maistry, 2010). However, the policies challenged the lives of blacks. From such an impoverished and starved political and socioeconomic backdrop, President Nelson R. Mandela's new 1994 post-apartheid administration devised the well-known RDP strategy.

The government of South Africa committed itself to formulating workable macroeconomic policies that would enhance the progress of the RDP as an "integrated and coherent growth and development strategy" (Republic of South Africa, 1994:04). The post-apartheid government acknowledged that the people truly "wanted change", which was a "legitimate" need that the government was going to timeously arrest. All political parties agreed to work together to strengthen the RDP's implementation. On behalf of the government, the then-president (Nelson Mandela) stated that the government would do all possible to satisfy the people's demands (Republic of South Africa, 1999).

The RDP caught the most important link necessary for effective policies, known as "voluntary participation" by the people. It was a people-driven programme with ongoing "consultation" and "joint policy formulation" to expedite implementation (Republic of South Africa, 1994:07). All competent government agencies were required to contribute to the programme's execution and propel it forward. The national government also encouraged municipal, provincial and district governments to create their own RDP plans that were in accordance with people's needs (Republic of South Africa, 1994).

At an inaugural address in parliament, Mandela reiterated the following stunning statement about the government's commitment:

"My government's commitment to creating a people-centred society of liberty binds us to the pursuit of the goals of freedom from want, freedom from hunger, freedom from deprivation, freedom from ignorance, freedom from suppression and freedom from fear. These freedoms are fundamental to the guarantee of human dignity. They will therefore constitute part of the centrepiece of what this government will seek to achieve, the focal point on which our attention will

be continuously focused. The things we have said constitute the true meaning, the justification and the purpose of the Reconstruction and Development Programme, without which it would lose all legitimacy” (Republic of South Africa, 1994).

According to Mashwama and Aigbavboa (2019), the RDP was guided by six principles, which include integration and sustainability, people-drivenness, peace and security, nation-building: meeting basic needs and building the infrastructure, and democratisation, assessment and accountability.

The programme is expected to be integrated into all sectors of the government (parastatals and organisations within civil society) and enlist partnerships with all people to focus the programme or policy. The principle of people-driven emphasises fostering a people-centred, participatory that empower individuals to decide for themselves. It was the government’s task to ensure “transparency” and “inclusivity”. Peace and security are the other crucial principles of the RDP. This is because the South African context has contracted violence, “lawlessness”, “abuse of women and children” and “fraud”, among other forms of crime, from the apartheid regime. Therefore, the country requires a comprehensive and “professional” police force and a “judicial system” that would “uphold the Constitution and respect human rights”. A country that is peaceful and safe is deemed to be an indispensable location for investment because it creates “an enabling environment to encourage investment” (Republic of South Africa, 1994:08).

Country-building in South Africa was made possible by the unusual capacity of political parties in the National Assembly to commit to nation-building while sharing a similar understanding and identity with the government. The impetus for all of this was the desire to embrace national sovereignty, with a special interest in everyone in South Africa joining hands in the construction of a new South Africa.

The goal of the RDP was to ensure equitable access to resources, services, and benefits for South Africans, ultimately leading to the fulfilment of basic needs and the development of essential infrastructure. The primary objective of the infrastructure programme was to maintain it in sync with excellent basic housing services like electricity, water, telecommunications, transportation, health, and education. It is predicted that this would lead to an increase in the

capacity and “potential” of individuals living in both rural and urban regions. This was done to counterbalance the history and context of suffering and misery in South Africa under apartheid. However, where that growth occurs, how sustainable it is, how it is distributed, the degree to which it contributes to building long-term productive capacity and human resource development, and what impact it has on the environment are the crucial questions when considering reconstruction and development. The RDP combines growth, development, rebuilding and redistribution into a single plan. The key to this connectivity is an infrastructure initiative that will give all of our people access to modern and effective services, including power, water, telecommunications, transportation, health, education, and training. This initiative will both fulfil fundamental needs and unlock previously closed doors.

The decision-making was to involve the people. Democratisation must begin to transform both the state and civil society. It is, rather, an active process allowing everyone to contribute to reconstruction and development. Assessment and accountability form the last principle that advocates for the need to clarify the goals and embrace an “enthusiastic pursuit of the goals” that are assessed, monitored and evaluated (Republic of South Africa, 1994:09).

The implementation of the RDP presents several problems since it entails processes and modes of engagement by organisations outside of government that are substantially different from the old apartheid regime. To execute and coordinate the RDP, efficient RDP institutions must be established in government at the national, provincial, and municipal levels.

This resulted in the introduction of other legislative measures such as the country’s Constitution of 1996, the Housing Act of 1997, the Rent Housing Consumer Protection Measure of 1998, the Housing Act of 1999, and the Home Loan and the Mortgage Disclosure Act of 2000 (Manomano, Tanga and Tanyi, 2018). Even though these laws have been drafted and enforced, nothing has been done to provide appropriate housing for the people of South Africa, since the majority of the population remains impoverished and in desperate need of shelter. As a result, there is a need for more effective laws to protect access to the supply of appropriate and quality housing.

2.6 RDP Housing Project

The RDP was based on a dialogue framework known as the White Paper. It was a platform to engage the state and the nation (Republic of South Africa, 1994:04). The RDP was to be

monitored, assessed and evaluated through this White Paper for the RDP of 1995. Regrettably, the White Paper of 1995 on housing was unable to address the housing problem in South Africa, especially the shortages, which the government acknowledged needed priority (Republic of South Africa, 1995). It was decided that the progress was falling short of expectations to meet the target of building houses in five years. The creation of the National Growth and Development Strategy (NGDS) and the Growth, Employment, and Redistribution (GEAR) were intended to fill the gap left by the RDP (Development Action Group 2003). These strategies were far from the focus because they emphasised economic growth rather than meeting the basic needs and developing the human capacities that facilitate poverty alleviation (Adelzadeh, 1996).

Understandably, strong and effective legislation is critical to the success of any policy in any country. In South Africa, legislation such as the Housing Amendment Act No. 8 of 1994 was drafted to promote the RDP's progress, viability, openness, and impartiality. This saw the formation of committees that were tasked to formulate possible legislation and policies to expedite the implementation of RDP goals.

The RDP housing projects were put in motion in 1996 and the government sought to correct the wrongs of the previous political system of apartheid. The RDP housing projects were thus created to address colonialism, racism, apartheid, misogyny, and oppressive labour practices that have dominated history. This was a result of poverty and degradation coexisting within modern cities and sophisticated mining, industrial, and commercial infrastructure. The income distribution was and is still racially skewed; correcting this was imperative (Manomano et al 2018). One of the most important aims of the RDP is to meet the basic needs of people. Needs such as job creation, land and agrarian reform to housing, water and sanitation, telecommunications, energy supplies, transport, nutrition, health care, the environment, social welfare, and security. The aim was to reconstruct the lives of South Africans. In addition, the industrial sector must develop new, more efficient, and cheaper products to meet our basic infrastructural needs. People must be able to make decisions as part of their community development ability, which is democracy. It leads to the growth of human resources. This involves equipping individuals with skills, training and teaching them so that their full potential may be fulfilled. Education is the backbone of human resource development, and it is supported by the family and the government to include all kinds of social development.

Additionally, the RDP was also important in addressing the problem of having an economy that is founded on systematically imposed racial segregation in all aspects of our society. Rural regions had been split into undeveloped Bantustans and well-developed commercial farming districts held by white people. Towns and cities have been separated into townships for blacks that lack basic infrastructure and well-resourced suburbs for whites (Republic of South Africa, 1996). This caused housing challenges to emerge as segregation prohibited settlement in any area one chose based on race. Discrimination in education, health, welfare, transportation, and employment has left severe wounds of inequity and inefficiency. Major companies headed by whites control large portions of the economy in commerce and industry. Cheap labour laws and occupational segregation concentrated talent in the hands of white people. Our workers are ill-equipped to deal with the rapid changes in the global economy. As a result, South Africans face significant challenges in every aspect of our society—economic, social, political, moral, cultural, and environmental. There is not a single segment of South African society, nor a single person living in South Africa, who has not been affected by the ravages of apartheid. As a direct result of apartheid practices and their downfall, the country is presently suffering (Manomano et al. 2018).

Apartheid unleashed a terrible wave of bloodshed in its last years. Hundreds of thousands of people have been cruelly slaughtered, wounded, or driven from their homes. Security personnel have all too often failed to safeguard civilians and have been accused of being complicit in and even instigating the violence. Millions of ordinary South Africans fought against this system for decades to improve their lives, restore peace, and create a more equitable country. In their homes, workplaces, townships, classrooms, clinics, and hospitals, on the land, and via cultural expression, black, white, women, men, old, and young South Africans dedicated their lives to the cause of a more compassionate South Africa. Our greatest strength is our communal legacy of struggle and our common yearnings, which the RDP builds on. Only a comprehensive strategy for utilising our country's resources would be able to reverse the catastrophe caused by apartheid. Only a concerted effort to harness people's life experiences, talents, energy, and ambitions will suffice (Manomano 2018).

2.7 Challenges faced in RDP Housing Projects

Beneficiaries of the Reconstruction and Development Programme houses (RDP) are facing challenges related to RDP houses. One of the major disadvantages of RDP houses is that sub-

standard material is used in the building of the houses. Research has shown that roofs, walls, floors, and doors are mostly of poor standard, as most are reported to be crumbling, falling off, and breaking without much external influence. However, due to the poor material used, Roberts, et al. (2018) state that the majority of the people who were allocated RDP houses are unhappy with the houses.

The size and spacing of houses should enable privacy and confidentiality for a family living with their children and relatives. Other scholars argue that RDP houses are most suitable for bachelors since they are not big enough to accommodate a family.

In the construction industry, there are standards that may need to be complied with for any project to work in both the private and public sectors. Such standards include policies such as the Housing Act of 1997, the National Home Builders Registration Council (NHBRC) and the Construction Industry Development Board (CIDB). The National Home Builders Registration Council (NHBRC) is a regulatory body established in 1997 to protect homeowners from contractors who deliver housing units of poor design, workmanship, and materials. If there are complaints about low-quality RDP houses despite the above standards, questions about standard compliance and sustainability arise. Good-quality materials must be used in the construction of the houses under the RDP project. The contractors building the houses must be professionals and the houses must be checked to see if they meet the required standards for good houses. To make sure the quality of the structure is maintained, the defect liability period must be increased in terms of years; this alone can improve the life of the structures.

Builders who construct homes are required by the Housing Consumers Protection Measures Act of 1998 to register with the NHBRC and to renew their membership on an annual basis (Act No. 95 of 1998). Prospective homes must be registered with the NHBRC at least 15 days before construction begins under this act (NHBRC 2020). The NHBRC quality inspectors will then visit the construction site during all critical construction stages. However, even with this act and regulatory board in place, sub-standard, unsustainable RDP houses continue to be a common sight and occurrence in South Africa. The government incurs additional costs in repairing these houses, which can cost up to three times the value of the RDP (Ana 2015). The Democratic Alliance (DA) stated in a presentation that eighty million rand was spent in the Free State to repair two hundred and four houses. In these cases, the regulators and building standards are still insufficient. RDP houses are still sub-standard, demonstrating the challenges

that face the sustainable construction of RDP houses in such a way that the technology and materials used in RDP houses are woefully inadequate.

The CIDB collaborated with the Department of Public Works. Their main goal was to give contractors credibility by grading projects they have worked on based on their net contract cost. This organisation promotes, among other things, construction procurement uniformity, infrastructure delivery that is efficient and effective and the improvement of abilities. The contractor's financial books are assessed to establish their financial capability. The assessment takes into account factors such as their best annual turnover and available capital. Subsequently, contractors are awarded a grade on a scale between two and nine, with nine being the highest grade (CIDB 2015).

This regulatory board, however, is unfortunately not used in the case of RDP construction. Only private-sector projects with a value of more than ten million rand or two hundred thousand rand in the public sector are required to apply to the CIDB. This excludes RDP housing since a single 40-square-metre house typically costs less than a hundred and twenty thousand rand (Mguli 2016). The RDP housing projects are left out of such an important authority in standards. Nokulunga, et al (2018:1765) point out that there is perpetual poor workmanship in the construction of RDP houses and that CIDB standards could easily address these construction challenges.

2.7.1 Lack of involvement of stakeholders

Community engagement is an important aspect of any project that affects the quality of life for the people involved. Prior to initiating any housing project, it is essential to adopt a bottom-up strategy, with community engagement progressing through outreach, communication, and consultation at each stage (Allen 2017). The beneficiaries are usually involved in the later stages and their involvement is very minimal, with limited room to sanction their expectations (Boiral 2017). It is done during occupation or after the occupation process. This results in little room left for the clients and occupants to demand changes in the housing schemes done already during the implementation of these projects. Most of it occurs through passive involvement, which shows a top-down approach to the running of these projects. Furthermore, frustrated beneficiaries resort to violent means to express their discontent with the government's inability to fulfil what they want (Mail and Guardian 2016). The government has to deal not only with

the challenge of providing shelter for homeless people due to poverty but also with the need to provide homes for those rendered homeless by people migrating to urban areas in search of employment or greener pastures (Aikaeli, Mtui, and Tarp, 2021). People from rural areas come to the urban areas in search of employment opportunities and tend to stay in squatter shelters. This has led to housing shortages and the growth of squatter camps, prompting the government to devise emergency housing schemes (Manomano 2018).

2.8 Lessons Learnt in RDP Housing Projects

The RDP, has to a greater extent, achieved its goal as the homeless and the less fortunate groups in South Africa are slowly getting houses. The participation of the community in the delivery of the project has provided positive feedback. However, many challenges were posed by the living arrangements brought about by the housing project, such as poor sanitation, corruption, too many backyard dwellers, and small houses, among many others (Charlton 2019). There is a need for post-occupation evaluation to assess the work done by the contractors for the clients. Quality focuses on the elimination of defects and variations and seeks to avoid waste of time, materials and financial resources due to rework.

The RDP, to some extent, eradicated poverty and provided some sort of health facilities to the needy, access to water and quality education. Furthermore, the construction of housing for people who, due to the legacy of apartheid, could not afford to own properties was aimed at (Parliamentary Liaison Office 2017).

There is evidence that the methods for building such houses are not procedural. For example, companies are not vetted enough based on their previous projects or ratings (Greyling 2017). Greyling (2017) argues that the theft of material and corruption ultimately have a bearing on the quality of the houses built. In addition, it is claimed that municipalities are not conducting due diligence on the history of companies winning tenders to build such houses. An example of this is that corporations with no previous history of project-building are given tenders to build thousands of houses. As such, the method for the selection of constructors is put into question. Poor workmanship is also the root cause of defects in low-income houses, in addition to inadequate monitoring and inspection, which in turn results in the low quality of the end product. Berrisford (2018) argues that there are certain contradictions and conflicts over how municipalities in South Africa intervene in relation to urban land. This intervention has also

been noted as one of the key drivers of corruption. This corruption is further increased by the high demand and low supply of housing systems in South Africa

The size and spacing of houses should enable privacy and confidentiality for a family living with their children or relatives. This plays a critical role in the growth and development of children in the future, as it is a long-term plan. Disappointingly, most of the housing projects are one-roomed and very small for privacy and confidentiality as well as for hygiene (Manomano et al. 2018). The size of the houses also do not allow personal growth in the families, such as gardening as a form of activity and the expansion of the houses as the family grows over the years.

The RDP houses are located kilometres away from town which has many disadvantages to occupants when it comes to access to basic facilities like banks, supermarkets, and other amenities. This has created problems for the beneficiaries with regard to travelling to work and schools and even medical facilities are not easily accessible. The poor location of the housing project as it is located on the outskirts of town where the land is cheap and in large quantities (Manomano, et al. 2015). This promotes unemployment, crime, and prostitution.

According to Aigbavboa (2012) cited in Aigbavboa and Thwala (2018), sufficient housing encompasses adequate space, affordability, basic infrastructure, and services such as water supply, sanitation, plumbing system management, security of tenure, structural strength and safety of the building, proper ventilation and heating systems, accessibility to the property, easy access to amenities (schools, churches, workplace, health care centres, libraries, and shopping centres) and an appropriate quality of environment and welfare organisations.

2.9 Mitigations for the challenges faced in RDP housing projects.

This section looks at ways to mitigate the challenges faced by residents during post-occupancy. Inner city buildings have the advantage that they reduce the cost of possible demolition and the cost of having to build a new building starting from scratch (Greyling 2017). Renovations are cheaper and quicker in terms of the time frame to be used by the end user. Inner city buildings also shrink the chances of corruption and misuse of government funds. They also produce better-quality buildings for the people (Greyling 2017). RDP housing is not only about the development of new houses but also the reconstruction of existing buildings. Existing resources are being maximised, such that every last piece of land is used for some sort of development.

The advantage of inner-city buildings is that they keep the city new and create employment opportunities. In addition, it reduces the cost of possible demolition and building a new building. Renovations are cheaper and quicker in terms of time frame so as to be used by the end-user. The latter also reduces the chances of corruption and the misuse of funds and improves the quality of building.

Furthermore, the main problems facing RDP housing is electricity supply, access roads, after-market maintenance of houses, and distance to medical facilities, amenities, and schools hence; the use of more funds, such as donations and taxes from the government to meet these loopholes (Dlamini and Reddy 2018). This will reduce unemployment, in turn reducing chances of theft and prostitution. The building of new schools and markets will open doors to new employment in those sectors. Measures should also be taken to educate people to develop skills in constructing and maintaining new developments. This helps in the upkeep of the buildings. The policies and standards have to be reinforced in each stage of the construction to ensure quality standards are met.

Additionally, the designs used can be improved for better quality and use in the long run. The physical design of the house can lead to energy savings by making use of passive design. When choosing the building material, factors such as the environment and recyclability should be kept in mind. The design of the house should also cater for future environmental factors such as rain and wind, which have the potential to lead to flooding and erosion. A well-planned design can effectively minimise these risks. The idea of prefabricated housing saves time and money if it is used correctly.

2.10 Conclusion

The literature review highlighted the post-occupancy evaluation. The chapter looked at the tendering procedure for RDP housing project construction, challenges faced in the projects and lessons from the RDP housing projects. The chapter also provided the legislation that guides housing in South Africa. From the review of the literature, most studies showed that levels of satisfaction with the housing project were generally low as the houses had a poor make. It is said that the houses were built using poor building materials so that in a short space of time the houses were falling apart. Residents faced a lot of challenges such as an unhealthy staying environment, pollution, prostitution and many more vices. Suggestions were that these

problems could be mitigated by government funding to improve the quality of housing amenities. There is a need for contractors to be diligent to make sure that the material used in building government houses is up to standard and good workmanship is provided. To conclude, the government has the task of providing decent accommodation to the less fortunate members of society through housing schemes. There are concerns raised, however, concerning the standard of the houses since it is reported that within a few years, the infrastructure was already dilapidated. As a result, there were sustainability questions about the houses. The next section looks at the methodology of this study.

CHAPTER 3

Research Methodology

3. Introduction

The purpose of this chapter is to present the research methodology for this research study on post-occupancy evaluation of RDP housing in the Mpumalanga Province. The chapter begins by explaining the research philosophy, research design and research strategy. Following this, the research instrument for data collection, namely questionnaires, is introduced. Subsequently, the chapter moves on to consider the sampling methods which were adopted during the study. This is followed by an explanation of the thematic data analysis, which was used by the researcher to analyse the data. The chapter closes by presenting the ethical issues that were applied by the researcher as well as measures that were taken by the researcher to ensure the validity and reliability of the research.

3.1 Research Design

A research design is a collection of guides or rules for data collection (Creswell and Creswell 2017). This addresses the structure for data collection and analysis. It delineates the structure that influences the technique for data collection and analysis and provides the connection between empirical data as well as their conclusions in a logical sequence to the initial research question of the study (Creswell and Creswell 2017). The research adopted a quantitative approach in the form of a questionnaire survey in the quest to develop guidelines for sustainable buildings through the implementation of post-occupancy evaluation (POE).

3.2 Population of the Study

The population of the study contains professionals within the Department of Human Settlements, Mpumalanga who are involved in the construction of RDP buildings. The construction process is shared by two sub-departments within the Department of Human Settlements. There is a programme management department and an engineering and quality assurance department. The breakdown of the number of professionals within each sub-department and their roles are illustrated below in Table 3.1 and 3.2 and the organogram is given 3.2.

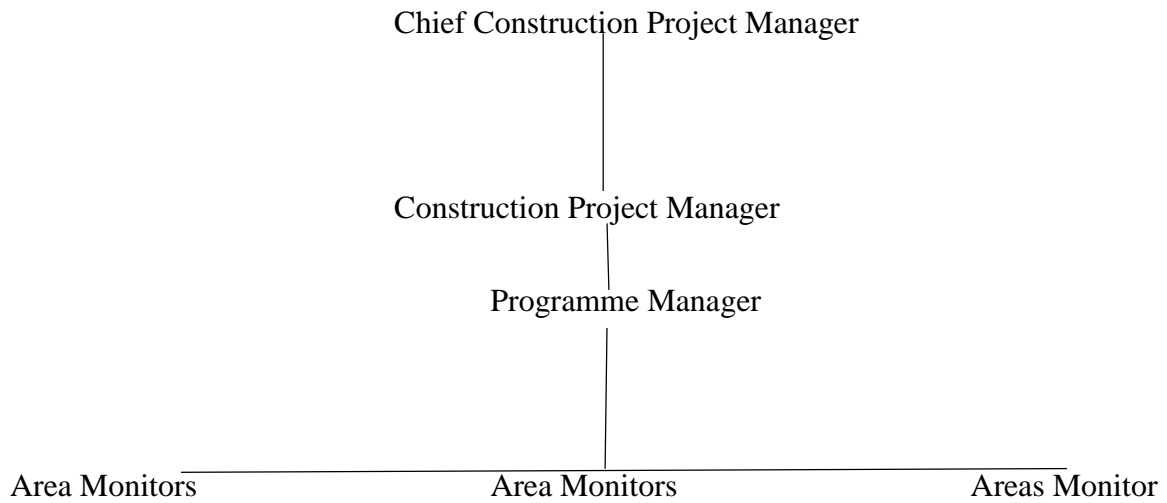


Figure 3.1 Organogram

District	Area Monitors	Programme managers	Construction Project Managers	Chief Construction Project managers	Total
Ehlanzeni	18	5	1	1	25
Nkangala	10	5	1	1	17
Gert Sibande	10	4	1	1	16
Total	38	14	3	3	58

Table 3.1 Department Population

The participants involved in this study are the area monitors, programme managers, construction project manager, and chief construction project manager.

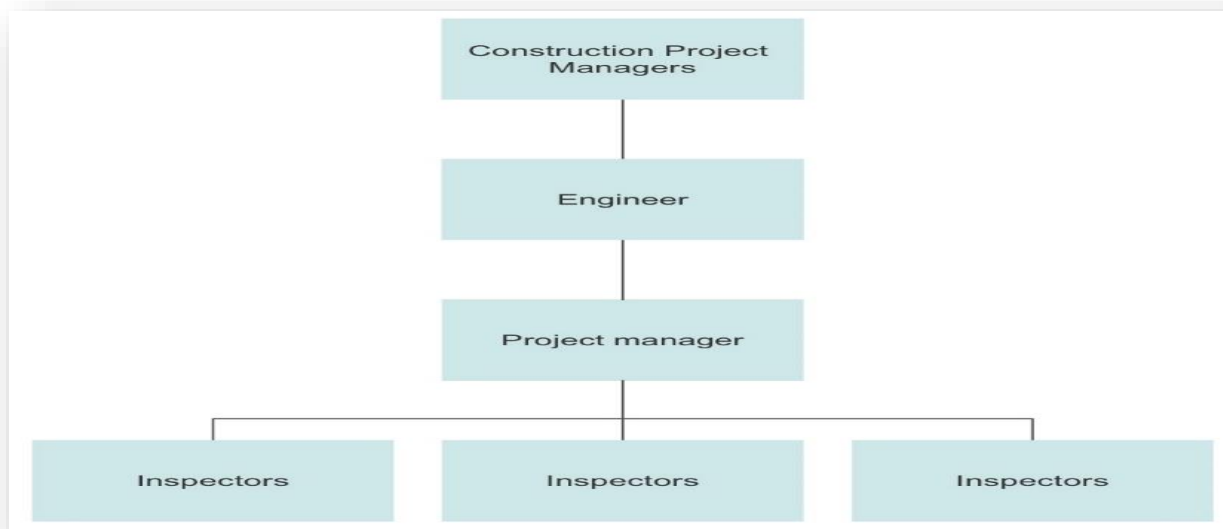


Figure 3.2 Engineering and Quality Assurance Department

District	Inspectors	Project manager	Engineer	Chief Engineer	Total
Ehlanzeni	5	2	1	1	9
Nkangala	5	2	1	1	9
Gert Sibande	5	2	1	1	9
Total	15	6	3	3	27

Table 3.2 Engineering and Quality Assurance Department Population

The study included a total of eighty-five (85) professionals from the designated areas, as indicated in the table.

3.3 Sampling

The sampling method is a technique for drawing a representative cluster of people from a specific population. Sampling and statistical inference are utilised in circumstances where it is practically impossible to gather data from each individual in the particular targeted population. Sampling is then divided into two processes: probability and non-probability sampling

(Taherdoost, 2021). The sampling method involves taking a representative choice of the population and using the data collected as research information. The research adopted the total population technique which involves investigating the whole population because of characteristics, proximity, and the limited number of the target population. This technique was also utilised because the entire population was relatively small; therefore, suitable for questionnaire distribution, ensuring cost-effectiveness while efficiently collecting large data quantities in a short space of time (Etikan, Musa and Alkassim 2016). The total population, as indicated above, was 85 respondents from the Department of Housing and Human Settlement, under the two sub-departments of Programme Management and the Engineering and Quality Assurance in the case area of the province of Mpumalanga, South Africa. However, the officials have functions to perform and may not be available. Of the 85 public officials who had been selected through the total population sampling technique, five were not available. Therefore, the target sample of 85 was reduced to 80.

3.4 Data collection instruments

Different methods are used to gather data from participants in a study. This study used a closed-ended questionnaire. A closed questionnaire is defined as the administration of a questionnaire with guided responses (Creswell 2016:46). Guided responses are advantageous because the researcher was able to obtain certain specific rigid data, which may be lost in the description if another method is used. The questionnaire was structured on a Likert scale with up to five responses coded from strongly disagree; disagree; neither agree nor disagree; agree; strongly agree. The questionnaires were administered by the researcher and the respondents were given two weeks to fill them out on their own and during their free time. The disadvantage of this data collection technique was that probing could not occur when varying responses were given to similar questions.

The questionnaire consisted mainly of close-ended questions so as to ensure that quantitative data were adequately captured. The survey questionnaires were designed to accomplish the above-mentioned objectives by gathering data on sustainable buildings through the implementation of POE in RPD buildings in Mpumalanga, South Africa. The questionnaire contained two sections (A and B). The first section (A) of the questionnaire elicited information on the demographic attributes of the study respondents. The attributes are gender, educational qualification, age, profession, and professional experience. Section (B) of the questionnaire

deals with questions from each of the objectives of the research. The questionnaire is estimated to take between 25 and 30 minutes to complete. There was no personal contact between the research participants and the researcher. The questionnaires were distributed and collected electronically to 80 participants.

3.5 Questionnaire data analysis

Data for this study was presented using charts, figures and analyses of the data were achieved using appropriate descriptive and inferential statistics. Descriptive statistical analysis extensively measures the characteristics of a study population, whereas inferential statistics draw conclusions or inferences about a population from data sets. The analyses of the data were facilitated by using the Statistical Package for Social Sciences (IBM SPSS Statistics 27). This package analyses the data that is imputed on it and creates graphs and themes for interpretation and discussion.

3.6 Validity and reliability

Two concepts are key in research, and these are reliability and validity. Reliability measures how dependable and consistent the instrument is, while validity measures the extent to which an empirical measure adequately reflects the real meaning of the concept under consideration (Darlington and Scott, 2020). The researcher relied on expert advice in determining the tools to collect data with, and the literature to consult, thus gaining content validity. The researcher also achieved validity by having a total population sample. According to Taherdoost (2016) cited in Mulisa, (2022), when a large population is used, criterion validity is achieved. The researcher achieved reliability of results by comparing the data to that of other researchers or previous studies. Corroboration of the results was performed, and this confirmed the validity of the results.

3.7 Procedure of obtaining Informed Questionnaire and Consent

The administration of the questionnaire was done through an online platform. The questionnaire was prepared, administered and collected online using Google Forms. The letter of information, as well as informed consent, was part of the information that was provided to the participants. Since the questionnaires were distributed electronically, the participants were required to read the informed consent form and confirm their voluntary participation.

The questionnaire was designed in such a way to ensure that the participants could only access to the questions after confirming that they had been duly informed about the research. Additionally, their participation in the research was voluntary as outlined in the consent form and letter of information.

3.8 Inclusion and exclusion criteria

The participants involved in this study are the workers in the engineering and quality assurance departments in the Ehlanzeni, Nkangala and Gert Sibande districts. In terms of inclusion criteria, the following professionals were considered: work inspectors, engineers, project managers; area monitors, programme managers, and construction project managers. These professionals are directly involved in the RDP project within the study area. In terms of the exclusion criteria, professionals outside these categories were not considered.

3.9 Ethical considerations

The researcher adhered to the research ethics policy as espoused by the Institutional Research Ethics Committee (IREC) of the Durban University of Technology. It aims to protect the rights and welfare of the research participants, animals and the environment by adhering to the principles of beneficence, justice and respect for persons, especially vulnerable populations, animals, and the environment. The researcher therefore complied with the ethics policy and sought permission where needed and obligations to the tenants of ethical practices of research.

3.9.1 Ensuring participants have given informed consent

According to Savin-Baden and Major (2023) participants are supposed to know when they are taking part in the study and not be forced into giving data to fulfil an individual's research objectives. As such, the participants were informed formally and freely gave their consent. In this study, a letter was sent to every participant attached to the questionnaire but not attached to the interviews, requesting their consent to take part in the study. The letter also explained the type of study and what was expected of them. A sample of the informed consent letter is attached as Appendix C.

3.9.2 Ensuring that permission is obtained.

In academic research, it is required that the researcher formally request permission to carry out the study from the required organisations (Saunders, et al. 2016:194). This researcher sought permission from the relevant authorities before commencement of the research. Once permission was granted, all potential and actual participants were engaged to outline the implications of participating in the study. The permission letter to conduct this study forms part of the list of appendices and is attached as Appendix C.

3.9.3 Ensuring confidentiality and anonymity

The research is intended to answer six intrinsic questions: who, when, what, where, why and how. It is not designed to directly focus on the participants, who are the source of the data used to tackle these questions. Saunders, et al. (2016:231) highlight that:

“Individuals and organisations should therefore remain anonymous and the data they provide should be processed to make it non-attributable unless there is an explicit agreement to attribute comments”.

This study ensured the anonymity of all participants by avoiding individual names by coding the data provided during data analysis. The researcher observed confidentiality by making sure that the information obtained was not accessible to any unauthorised persons, except for the research team. Employees were bound by the oath of secrecy and confidentiality.

3.10 Conclusion

This study investigates the post-occupancy evaluations of the RDP housing in Mpumalanga Province by comparing the intended outcomes of the RDP housing project against the end user’s honest reviews after occupying the residences. Importance was placed on the technology and materials used in building the RDP houses. To achieve this, a problem statement was provided outlining the methods, standards and technology gaps found post-occupancy of the RDP houses. As such, the study provided the aims of the study, which sought to investigate the level of satisfaction of the occupants post-occupation of the RDP houses; assess the challenges faced by the residents post-occupancy; mitigate the challenges faced by the residents post-occupancy of the RDP houses; and proffer solutions to improve service delivery in future RDP

projects. The current methods, standards and technology used were discussed and problematized following the literature review. Finally, the methodology of the study was provided, outlining the research design, methodology, population and sampling, data collection instruments, strategy for data analysis, reliability and validity, and finally ethics of the study.

Chapter 4

Data Presentations and Interpretation

4.1 Introduction

The preceding chapter provided the details of the research methodology, the research instruments and the ethical considerations for this study. This chapter presents the findings of this study, using graphs and tables. The chapter also interprets the findings of the study from which the analysis and discussion will be drawn in the later chapter. The next section presents the participants' background data.

4.2 Background Information

4.2.1 Gender

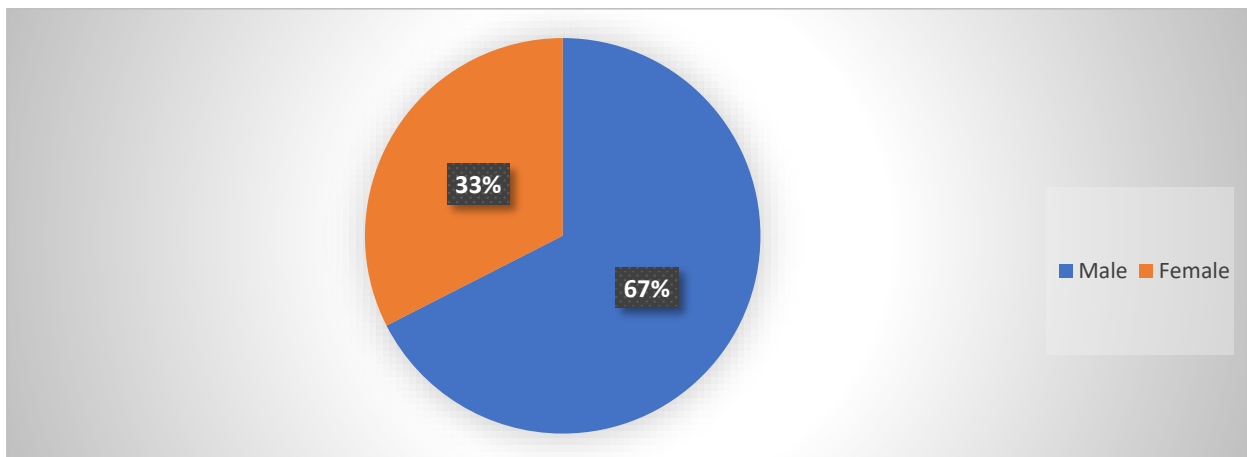


Figure 4.1 Gender

Figure 4.1 provides the gender ratio of participants who formed part of this research. The figure above shows that 54 (67%) males and 26 (33%) females, yielding a total of 80 participants in the study. The gender demographics for the organisation under study encompasses a total population of 85 people. The researcher places on record that these dynamics are based on the organisation and in no way was the questionnaire targeted at any specific gender.

4.2.2. Educational Qualification

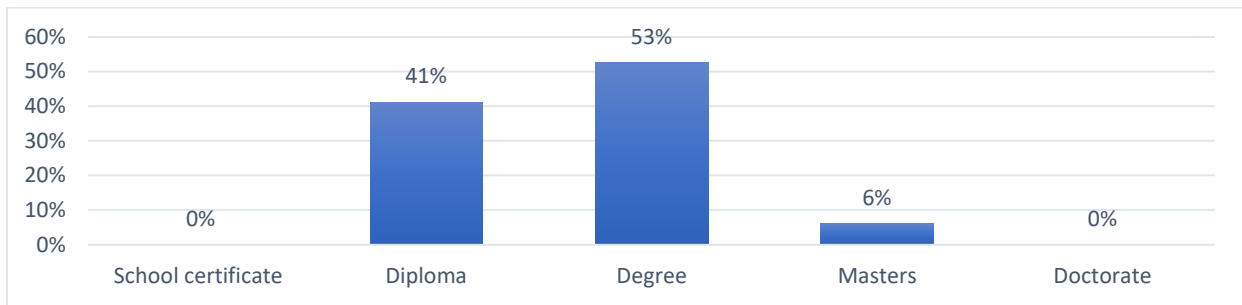


Figure 4.2 Educational Qualification

Figure 4.2 shows the education level of the respondents to this study. The majority of the respondents (53%) indicated that they had obtained a degree, 6% had obtained a master’s degree, and 41% had a diploma. The importance of this was to understand how many could comprehend the questions posed from an academic point of view, and the statistics show that all participants are literate.

4.2.3 Age

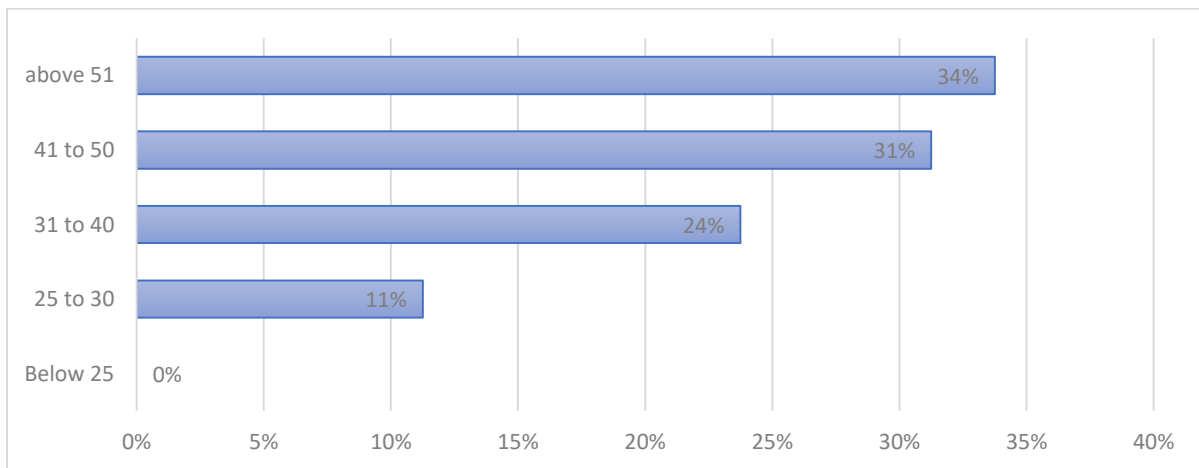


Figure 4.3 Age of range of participants

Figure 4.3 above shows the age range of the participants. It was found that 34% were above 51 years of age, 31% were in the 41–50 years of age range, 24% were in the 31–40 years of age range, and only 11% were in the 25–30 years of age range. The results show that all participants were adults, and this information provided the maturity in understanding the concept of post-occupation in South Africa.

4.2.4 Profession

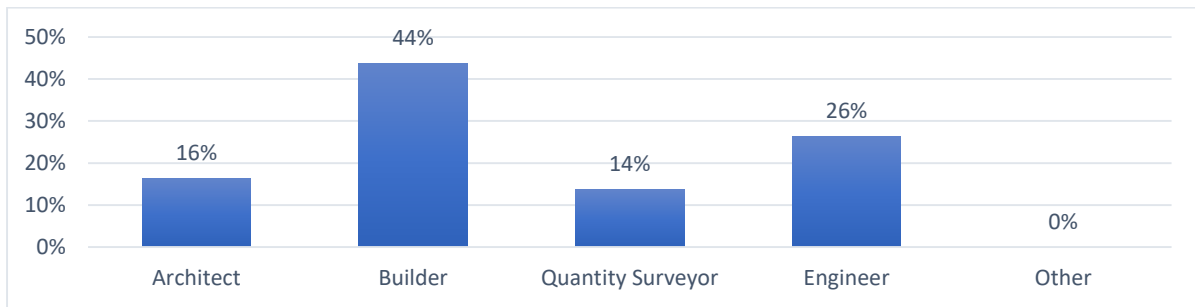


Figure 4.4 Profession of Participants

Figure 4.4 shows the professions held by the participants. Most of the participants (44%) are builders, 26% are engineers, 16% are architects and 14% are quantity surveyors. The importance of these statistics lies in obtaining a detailed understanding of the various professions that are tasked with post-occupancy. The individuals have different roles, and this brings about rich primary data for this study.

4.2.5 Years of Working Experience

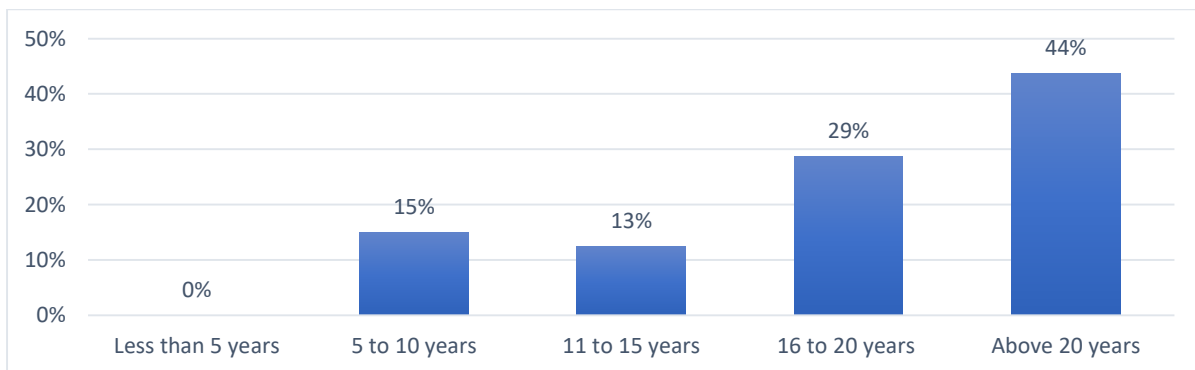


Figure 4.5 Years of Working Experience

Figure 4.5 above highlights the years of work experience of those who responded to the questionnaire. The study found that all participants have five years or more of work experience. This was shown by most of the participants (44%) reporting that they have above 20 years of work experience, 29% have between 16 and 20 years, 13% have between 11 and 15 years, and lastly, 15% have between 5 and 10 years of work experience. The effect of understanding this

data also influences the quality of the data and on-the-job knowledge of the systems of post-occupancy, thus enhancing the quality of the data.

4.3 Objective 1

4.3.1 Awareness of Post-Occupancy Evaluation

Are you aware of Post-occupancy Evaluation		
	YES	NO
Number of respondents and Percentage of respondents	80 (100%)	0 (0%)

Table 4.1 Awareness of Post-Occupancy Evaluation

Table 4.1 above highlights that all the respondents (100%) to this study were aware of post-occupancy evaluation in Mpumalanga Province. This finding enables rich data to be collected, as all the respondents were aware of post-occupancy evaluation practices in Mpumalanga.

4.3.2 Awareness of Post-Occupancy Evaluation

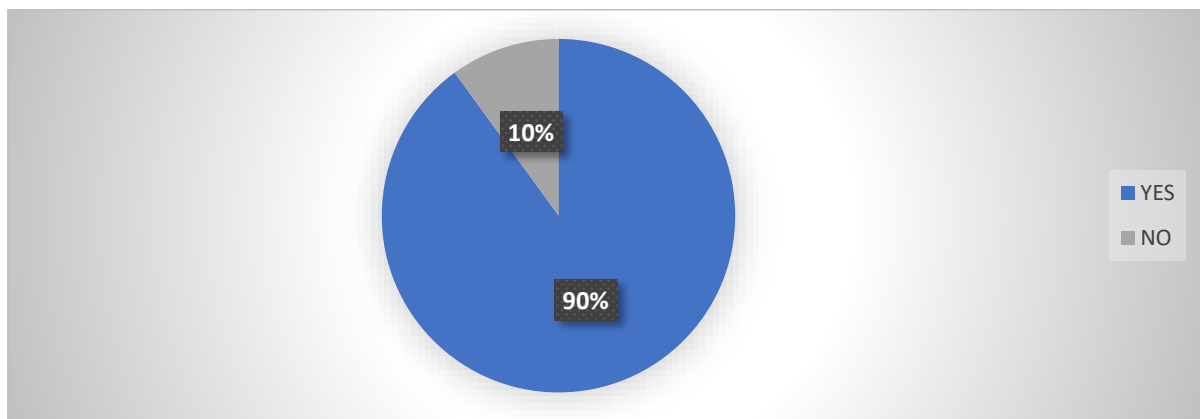


Figure 4.6 Awareness of Post-Occupancy Evaluation in RDP Buildings

Figure 4.6 gives a picture of the respondents' awareness of post-occupancy evaluation. 90% of the respondents highlighted that they were aware of post-occupancy evaluation in Mpumalanga Province. 10% of the respondents indicated that they were not aware of such an evaluation. However, the study found that the majority of the respondents were aware of post-occupancy

evaluation, allowing a further understanding of this evaluation process. This finding is thus in line with the level of work experience shown in Figure 4.5.

4.4 Objective 2

This section presents the findings for objective 2, which sought to investigate the barriers influencing the implementation of post-occupancy evaluation practices in Mpumalanga, South Africa.

4.4.1 Lack of Legislation

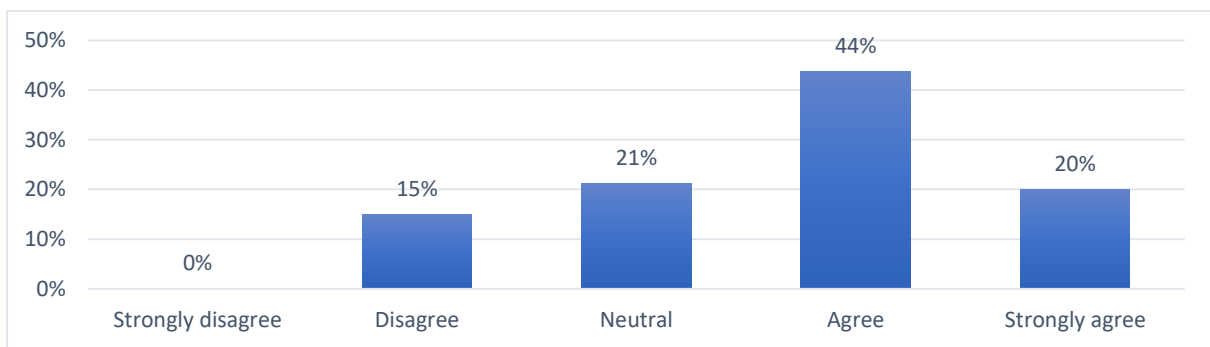


Figure 4.7 Lack of Legislation

Figure 4.7 above shows results on whether a lack of legislation is a barrier to the implementation of post-occupancy evaluation. The findings show that most of the respondents (44%) agree that the lack of legislation, while 20% strongly agree that the lack of legislation is a barrier that influences the implementation of POE in Mpumalanga Province. However, 21% remained neutral to the question, while 15% disagreed that a lack of legislation was to blame for the implementation of POE.

4.4.2 Threats of Litigation

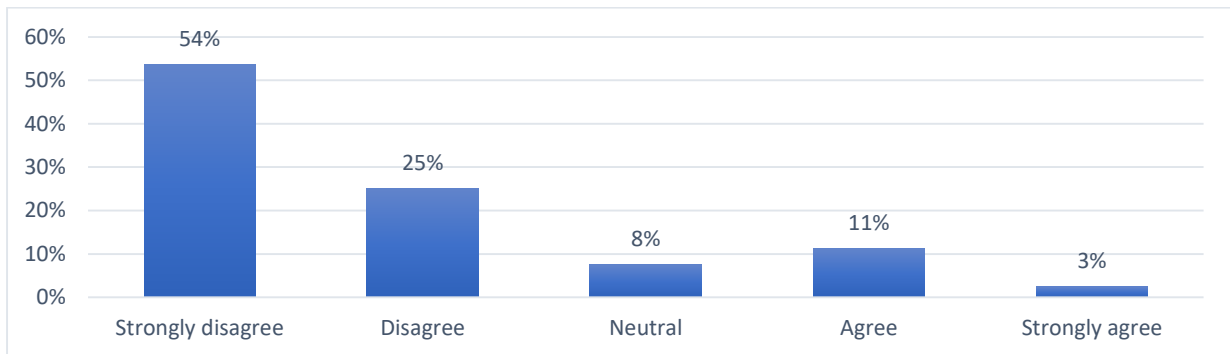


Figure 4.8 Threats of Litigation

The graph above (Figure 4.8) shows the responses to the view respondents had on threats of litigation as a barrier that influences the implementation of POE in Mpumalanga Province. The majority of the participants (54%) strongly disagreed that threats of litigation influence the implementation of POE, while 25% of the respondents disagreed. However, 8% of the respondents remained neutral and thus could neither confirm nor deny the statement. 11% and 3% of the respondents agreed and strongly disagreed, respectively, on the question. The findings from Figure 4.8 show that the majority of the respondents did not see threats of litigation as influencing the implementation of POE if those who strongly disagreed and disagreed were combined.

4.4.3 Lack of Education in Professional Programmes

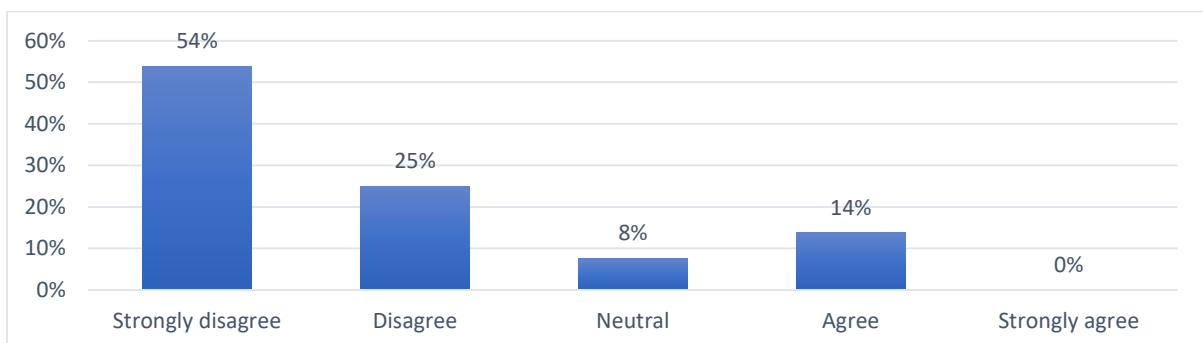


Figure 4.9 Lack of Education in Professional Programmes

Figure 4.9 shows the responses that were gathered from participants in response to the inquiry about whether a lack of education in professional programmes is a barrier that influences the implementation of POE in Mpumalanga Province. The majority of the respondents (54% and 25%) strongly disagreed and disagreed that a lack of education in professional programmes influences the implementation of POE, respectively. Moreover, 14% of the respondents agreed that it is indeed a barrier that influences the implementation of POE in the province. The findings as presented in Figure 4.9 also show that 8% had no comment on the question and thus remained neutral. The finding, therefore, shows that the majority of the respondents did not see a lack of education in professional programmes as a barrier influencing the implementation of POE in the Mpumalanga Province.

4.4.4 Lack of Agreed and Reliable Indicators

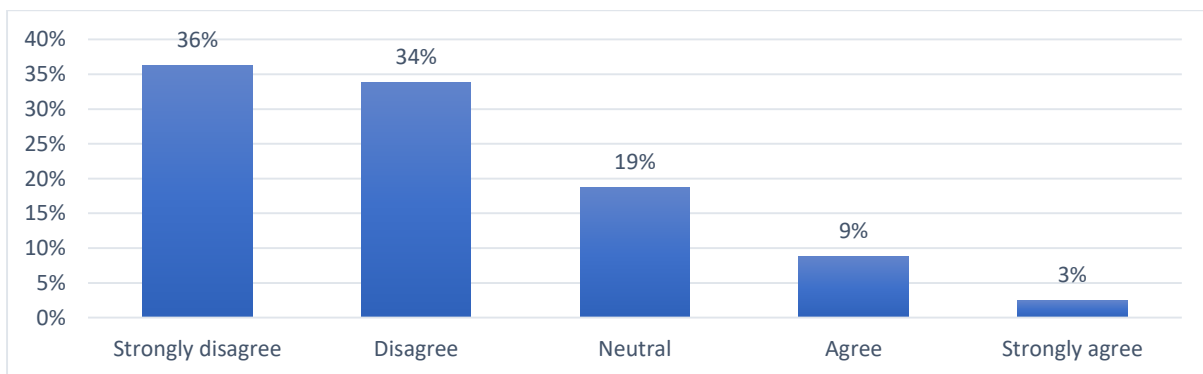


Figure 4.10 Lack of Agreed and Reliable Indicators

The above graph (Figure 4.10) shows responses given by respondents when asked if the lack of agreed-upon and reliable indicators is a barrier that influences the implementation of POE. 36% of the respondents and 34% strongly agreed and agreed, respectively, that the lack of agreed and reliable indicators is a barrier that influences the implementation of POE. 19% of the respondents remained neutral to the question, while 9% agreed-upon and 3% strongly agreed that it is indeed a barrier that influences the implementation of POE in Mpumalanga Province. The findings, however, show that the majority of the respondents disagreed that a lack of agreed and reliable indicators influences the implementation of POE; those that strongly disagreed and simply agreed are combined.

4.4.5 Potential Liability for Owners

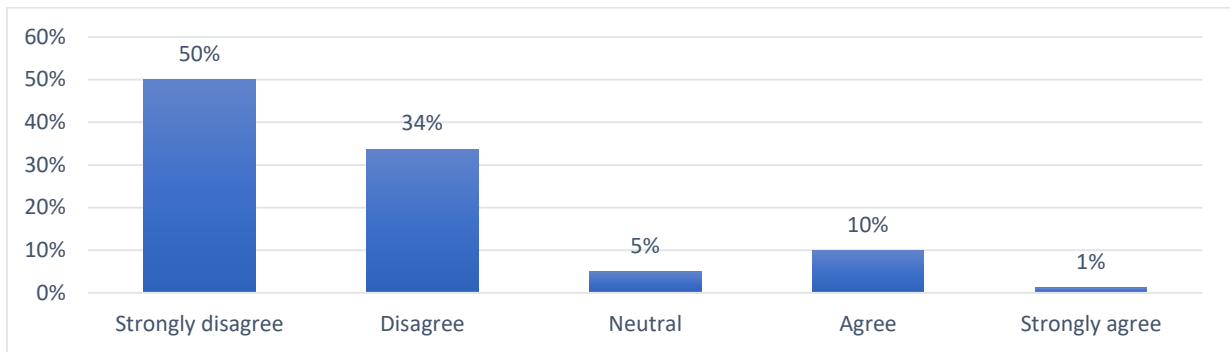


Figure 4.11 Potential Liability for Owners

Figure 4.11 shows the responses participants gave when asked if potential liability for owners is a barrier influencing the implementation of POE in Mpumalanga Province. The research findings show that 50% of the respondents strongly disagreed that it is a barrier, while 34% disagreed that it is a barrier that influences the implementation of POE. Additionally, the graph above shows that 10% agreed and 1% strongly agreed that it is a barrier that influences the implementation of POE. However, 5% could neither disagree nor agree with the question and thus remained neutral. The findings for this question show that the majority of the respondents disagreed that potential liability for owners is a barrier that influences the implementation of POE in Mpumalanga Province.

4.5.6 Exclusion from Current Delivery Expectations

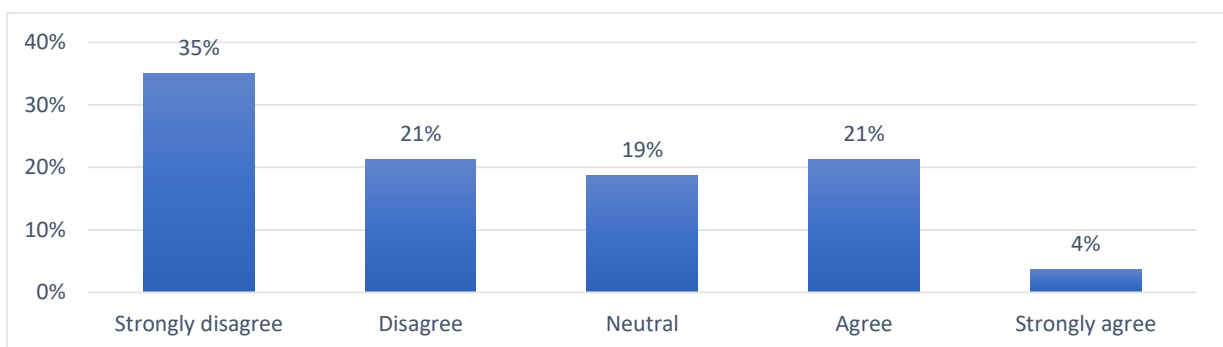


Figure 4.12 Exclusion from Current Delivery Expectations

Figure 4.12 presents the responses that respondents gave when asked if exclusion from current delivery expectations was a barrier influencing the implementation of POE in Mpumalanga

Province. 35% of the respondents strongly disagreed that exclusion from current delivery expectations is a barrier influencing the implementation of POE. 21% of the respondents disagreed with the same question, while 19% remained neutral. Only 21% and 4% of the respondents indicated that exclusion from current delivery expectations is a barrier influencing the implementation of POE. A careful look at those who disagreed and strongly disagreed shows that most of the respondents disagreed that exclusion from current delivery expectations is a barrier influencing the implementation of POE.

4.4.7 Lack of Trained Practitioners of POE

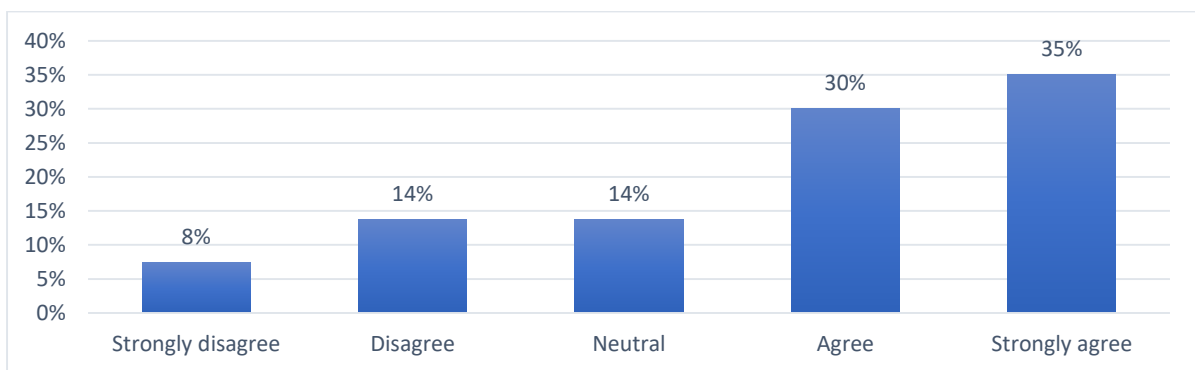


Figure 4.13 Lack of Trained Practitioners of POE

The diagrammatic representation above (Figure 4.13) highlights the findings on the lack of trained practitioners of POE as a barrier influencing the implementation of POE. The findings are as follows: 35% strongly agreed, 30% of the respondents agreed, and 14% remained neutral. However, 14% of the respondents disagreed, while 8% strongly disagreed, that the lack of trained practitioners of POE is a barrier influencing the implementation of POE in Mpumalanga Province. The findings for this question show that most of the respondents agreed and strongly agreed that the lack of trained practitioners of POE is a barrier influencing the implementation of POE when the numbers are combined.

4.4.8 Fragmented Incentives and Benefits within the Procurement and Operation Processes

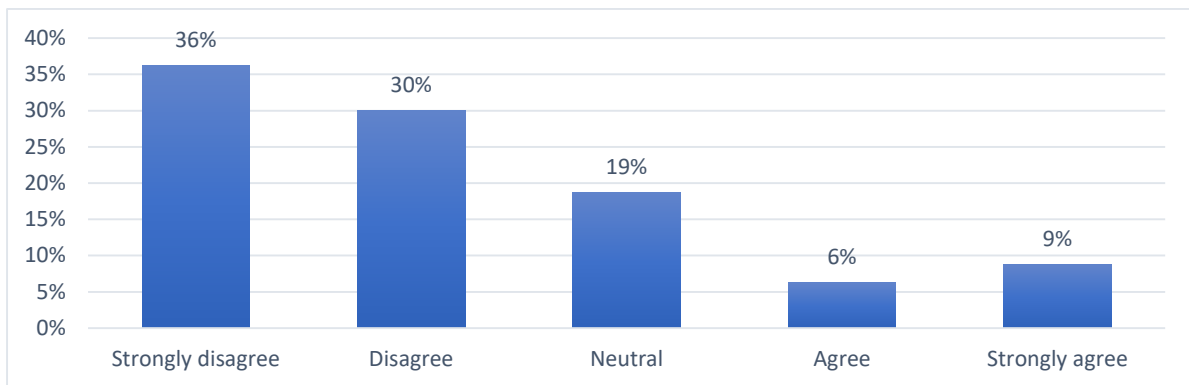


Figure 4.14 Fragmented Incentives and Benefits within the Procurement and Operation Processes

Figure 4.14 above shows the percentage of respondents who responded to the question of whether fragmented incentives and benefits within the procurement and operation processes are a barrier influencing the implementation of POE. 36% of the respondents strongly disagreed that fragmented incentives and benefits within the procurement and operation processes are a barrier influencing the implementation of POE. 30% simply disagreed, 19% remained neutral, 6% agreed and 9% strongly disagreed when asked the same question. The findings, therefore, show that most of the respondents (36%) strongly agreed and (30%) disagreed that fragmented incentives and benefits within the procurement and operation processes are a barrier influencing the implementation of POE in Mpumalanga Province.

4.4.9 Exclusion from Professional Curricula

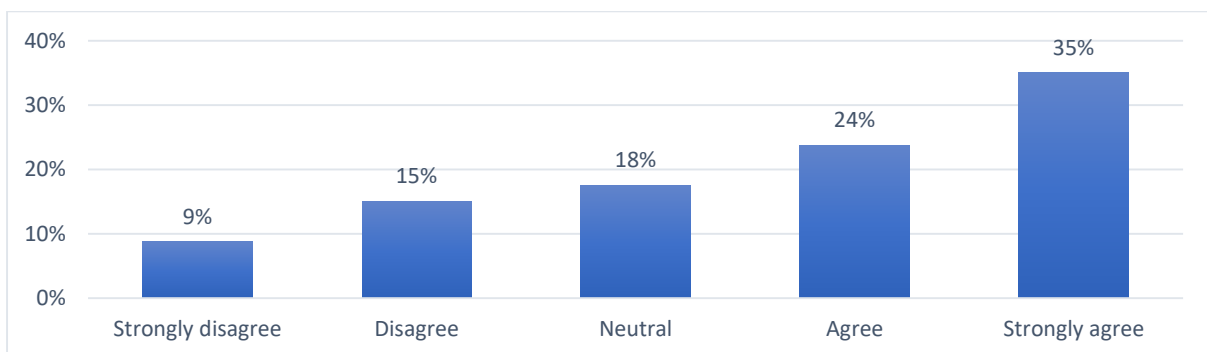


Figure 4.15 Exclusion from Professional Curricula

Figure 4.15 presents the responses that were gathered from respondents when they were asked if exclusion from professional curricula is a barrier that influences the implementation of POE in Mpumalanga Province. Most of the respondents, 35% and 22%, strongly agreed and agreed that exclusion from professional curricula is a barrier influencing the implementation of POE, respectively. Moreover, 15% of the respondents disagreed and 9% strongly disagreed that it is indeed a barrier that influences the implementation of POE in the province. The findings as presented in Figure 4.15 also show that 18% had no comment on the question and thus remained neutral. The finding, therefore, shows that the majority of the respondents did not see exclusion from professional curricula as a barrier influencing the implementation of POE in the Mpumalanga Province.

4.4.10 The Sheer Number of Players Involved

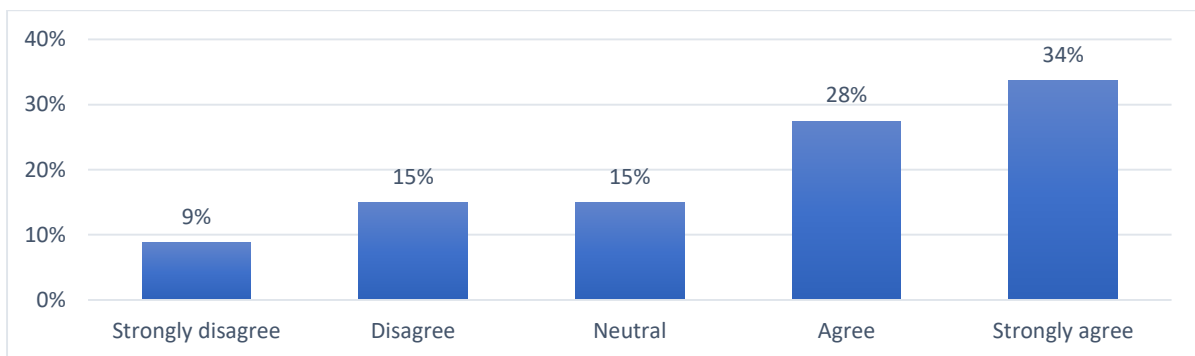


Figure 4.16 The Sheer Number of Players Involved

Figure 4.16 shows the percentage of respondents who responded to the question of whether the sheer number of players involved is a barrier influencing the implementation of POE. 34% of the respondents strongly agreed that the sheer number of players involved is a barrier influencing the implementation of POE. 28% simply agreed, 15% remained neutral, while 15% disagreed and 9% strongly disagreed when asked this same question. The findings, therefore, show that most of the respondents (34%) strongly agreed and 28% agreed that the sheer number of players involved is a barrier influencing the implementation of POE in Mpumalanga Province.

4.4.11 Split Incentives

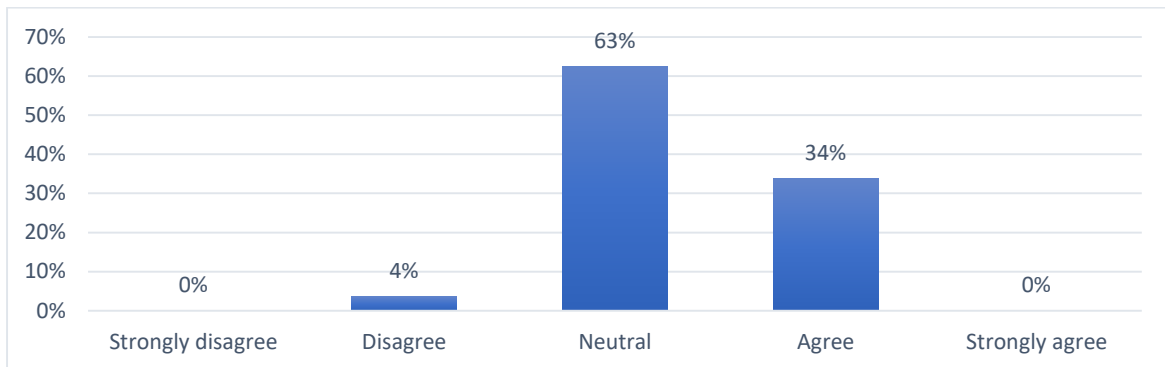


Figure 4.17 Split Incentives

Figure 4.17 above shows the percentage of respondents who responded to the question of whether split incentives are a barrier influencing the implementation of POE. The majority of the respondents (63%) remained neutral on this question. 34% strongly agreed, while 4% disagreed when asked the same question. The findings, therefore, show that the majority of the respondents chose neither to agree nor disagree when asked if split incentives were a barrier influencing the implementation of POE in Mpumalanga Province.

4.4.12 Long-term owning and operating costs

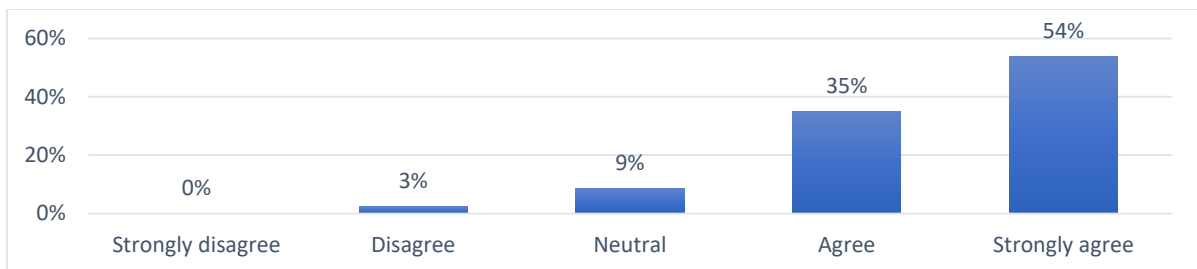


Figure 4.18 Long-term owning and operating costs

The diagram above (Figure 4.18) highlights the findings on long-term ownership and operating costs as barriers influencing the implementation of POE. The findings are as follows: 54% strongly agreed, 35% of the respondents agreed, and 9% remained neutral. However, 3% of the respondents disagreed that long-term ownership and operating costs are barriers influencing the implementation of POE in Mpumalanga Province. The findings for this question show that

the majority of the respondents (54%) strongly agreed that long-term ownership and operating costs are a barrier influencing the implementation of POE.

4.4.13 Lack of progress towards POE

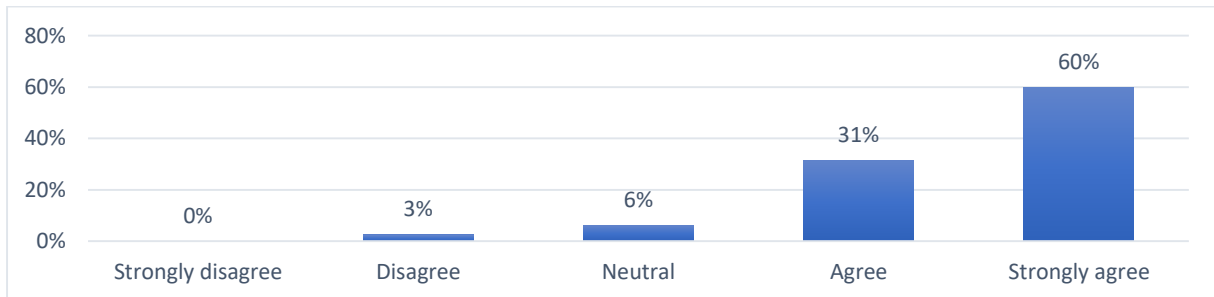


Figure 4.19 Lack of progress towards POE

Figure 4.19 highlights the findings on the lack of progress towards POE as a barrier influencing the implementation of POE. The findings highlight that 60% strongly agreed, 31% of the respondents agreed, and 6% remained neutral when asked the question. However, 3% of the respondents disagreed, while none strongly disagreed, that a lack of trained progress towards POE is a barrier influencing the implementation of POE in Mpumalanga Province. The findings for this question show that the majority of the respondents (60%) strongly agreed that lack of trained progress towards POE is a barrier influencing the implementation of POE in Mpumalanga Province.

4.4.14 POE Exclusion from Professional Curricula

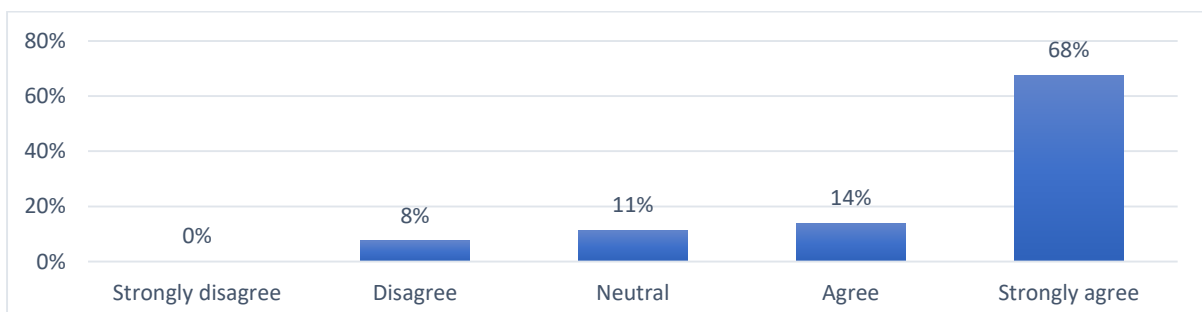


Figure 4.20 POE Exclusion from Professional Curricula

Figure 4.20 presents the responses that respondents gave when asked if POE exclusion from current professional curricula is a barrier influencing the implementation of POE in Mpumalanga Province. The majority of the respondents (68%) strongly agreed that POE exclusion from professional curricula is a barrier influencing the implementation of POE. 14% of the respondents agreed with the same question, 11% remained neutral, only 8% strongly disagreed, while none of the respondents indicated that POE exclusion from professional curricula is a barrier influencing the implementation of POE. The finding, therefore, shows that the majority of the respondents agreed that POE exclusion from professional curricula is a barrier influencing the implementation of POE.

4.4.15 Lack of Incentives

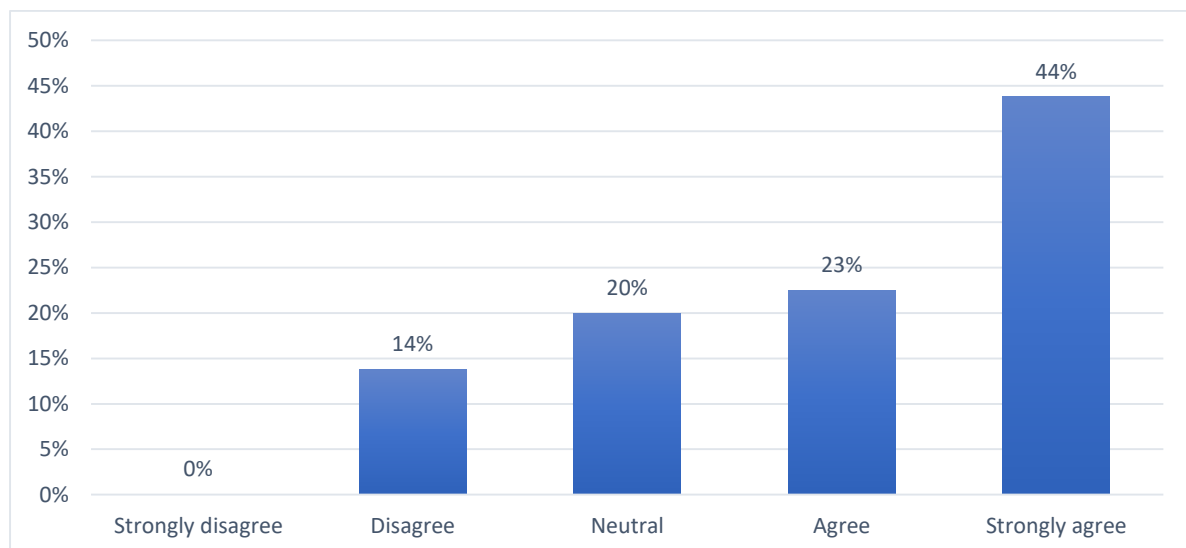


Figure 4.21 Lack of Incentives

Figure 4.21 shows the responses that respondents gave when asked if the lack of incentives is a barrier influencing the implementation of POE in Mpumalanga Province. Most of the respondents (44%) strongly agreed that a lack of incentives is a barrier influencing the implementation of POE. Additionally, 23% of the respondents agreed with the same question, while 20% remained neutral. Only 14% of the respondents indicated that a lack of incentives was a barrier influencing the implementation of POE. The finding, therefore, shows that the majority of the respondents (44%) agreed and 23% strongly agreed that a lack of incentives is a barrier influencing the implementation of POE.

4.4.16 Lack of Information Feedback

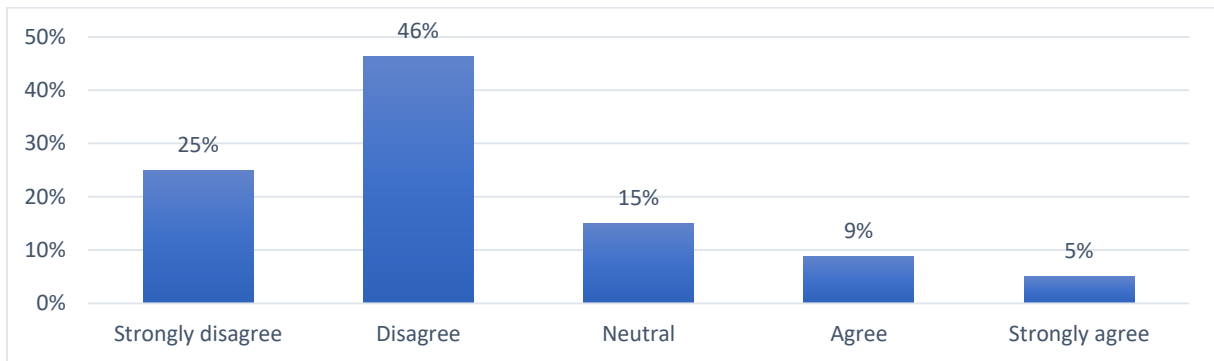


Figure 4.22 Lack of Information Feedback

Figure 4.22 above shows the percentage of respondents who responded to the question of whether lack of information feedback is a barrier influencing the implementation of POE. 46% of the respondents disagreed that a lack of information feedback is a barrier influencing the implementation of POE. However, 25% strongly disagreed, 15% remained neutral, 9% agreed and 5% strongly agreed when asked the same question. The findings, therefore, show that, most of the respondents (46% strongly disagreed and 25% disagreed) that a lack of information feedback is a barrier influencing the implementation of POE in Mpumalanga Province.

4.4.17 Lack of Adequate Resources for the POE

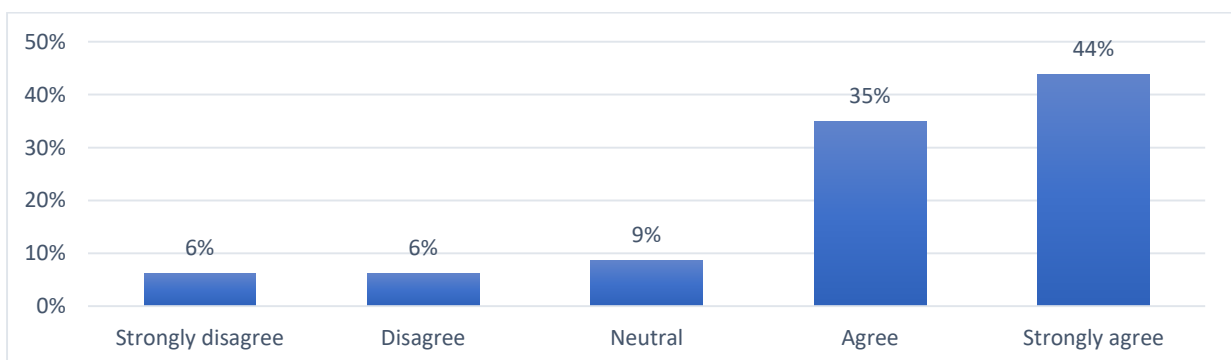


Figure 4.23 Lack of Adequate Resources for the POE

Figure 4.23 above shows the percentage of respondents who responded to the question of whether the lack of adequate resources for POE is a barrier influencing the implementation of

POE. Most of the respondents (44%) of the respondents strongly agreed that the lack of adequate resources for the POE is a barrier influencing the implementation of POE. Of the respondents, 35% agreed, 9% remained neutral, 6% disagreed and 6% strongly disagreed when asked this same question. The findings for this research show that most of the respondents (44%) strongly agree and (35%) agreed that the lack of adequate resources for POE is a barrier influencing the implementation of POE in Mpumalanga Province.

4.4.18 Lack of Knowledge of POE Procedures and Processes

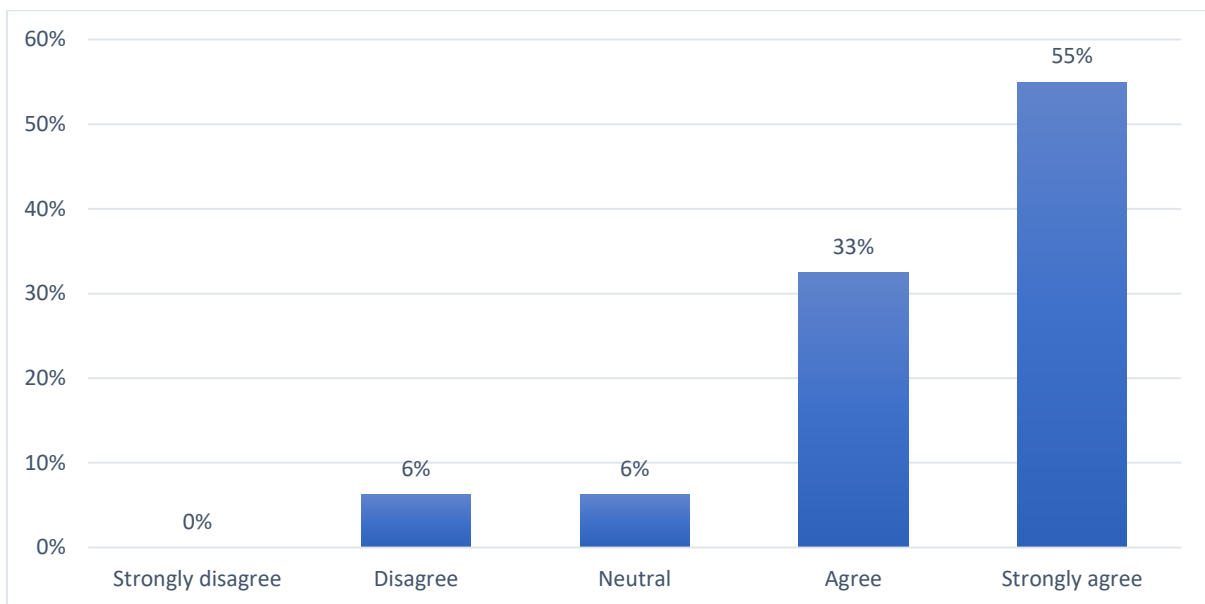


Figure 4.24 Lack of Knowledge of POE Procedures and Processes

Figure 4.24 shows the responses that respondents gave when asked if lack of knowledge of POE procedures and processes was one of the barriers influencing the implementation of POE in Mpumalanga Province. The majority of the participants (55%) strongly agreed that a lack of knowledge of POE procedures and processes is a barrier influencing the implementation of POE, 33% agreed with the same question, while 6% remained neutral. However, 6% of the respondents indicated that a lack of knowledge of POE procedures and processes is a barrier influencing the implementation of POE. A careful look at the above graph shows that the majority of the respondents strongly agreed that a lack of knowledge of POE procedures and processes is a barrier influencing the implementation of POE.

4.4.19 Lack of Awareness of POE

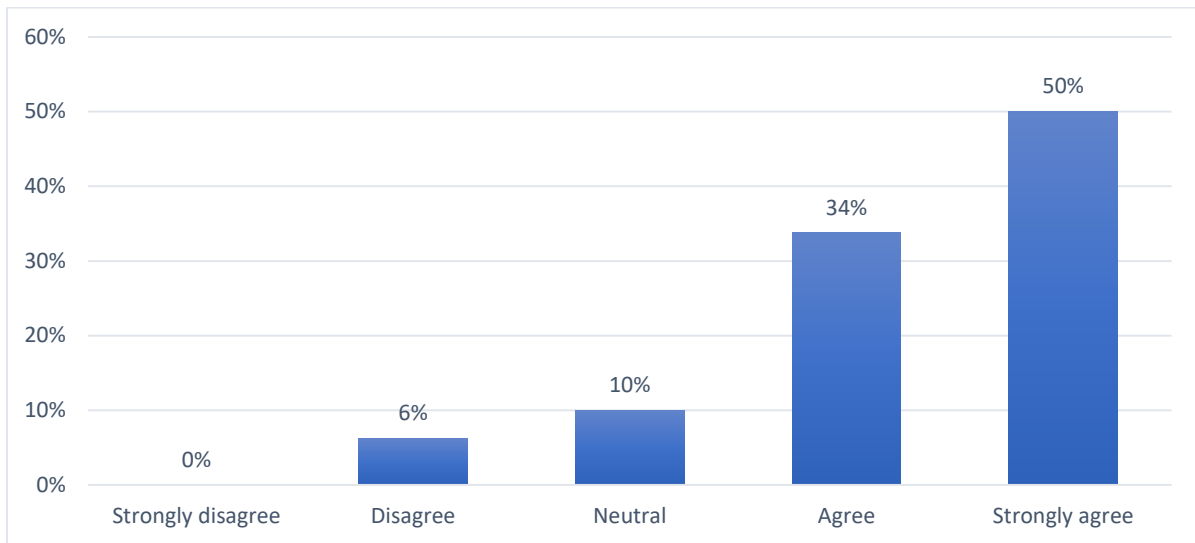


Figure 4.25 Lack of Awareness of POE

Figure 4.25 presents the responses that respondents gave when asked if lack of awareness of POE is a barrier influencing the implementation of POE in Mpumalanga Province. The majority of the respondents (50%) strongly agreed that lack of awareness of POE is a barrier influencing the implementation of POE. The findings of this study also reveal that 34% of the respondents agreed with the same question, while 10% remained neutral. Only 6% and 0% of the respondents indicated that a lack of awareness of POE is a barrier influencing the implementation of POE. The finding, therefore, shows that the majority of the respondents agreed that lack of awareness of POE is a barrier influencing the implementation of POE.

4.4.20 Management Preference to Increase Income at the Expense of POE

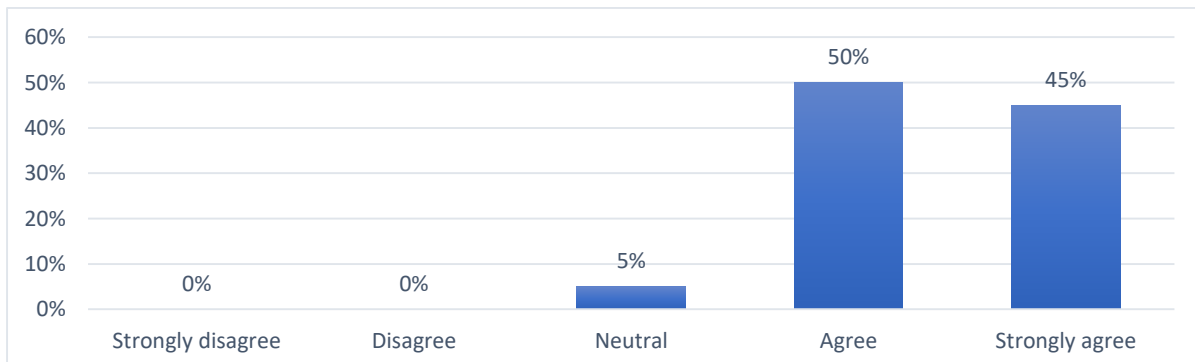


Figure 4.26 Management Preference to Increase Income at the Expense of POE

Figure 4.26 above highlights the responses that respondents gave when asked about management preference to increase income at the expense of POE, which is a barrier influencing the implementation of POE in Mpumalanga Province. The majority of the respondents (50%) agreed that management’s preference to increase income at the expense of POE is a barrier influencing the implementation of POE. Of the respondents of this study, 45% strongly agreed with the same question, while 5% remained neutral. However, none of the respondents indicated that management preference to increase income at the expense of POE is a barrier influencing the implementation of POE. Figure 4.26 shows that the majority of the respondents agreed that management preference to increase income at the expense of POE is a barrier influencing the implementation of POE.

4.4.21 Lack of support from top/senior management

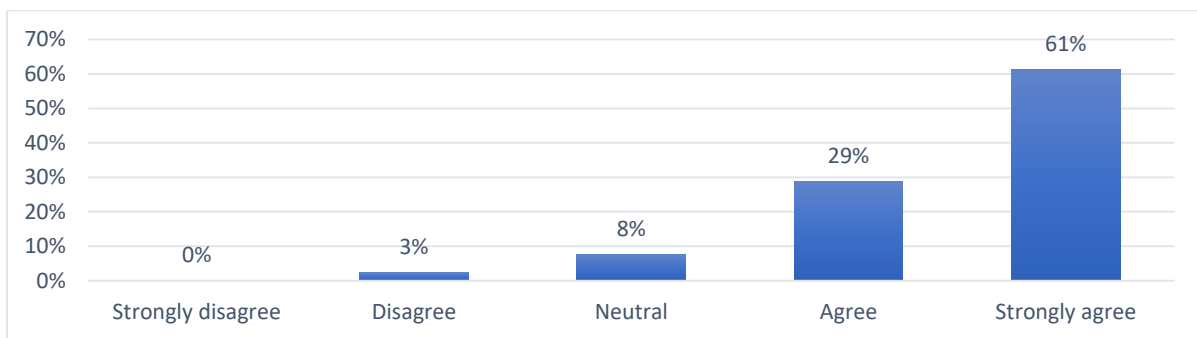


Figure 4.27 Lack of support from top/senior management

Figure 4.27 shows the finding after respondents were asked if lack of support from top/senior management was one of the barriers influencing the implementation of POE in Mpumalanga Province. The majority of the participants (61%) strongly agreed that a lack of support from the top/senior management is a barrier influencing the implementation of POE. Moreover, 29% agreed with the same question, while 6% remained neutral. However, only 3% of the respondents indicated that lack of support from top/senior management is a barrier influencing the implementation of POE. This finding, therefore, reveals that the majority of the participants see a lack of support from top/senior management as a barrier influencing the implementation of POE.

4.4.22 Lack of Coordination and Organisation for POE

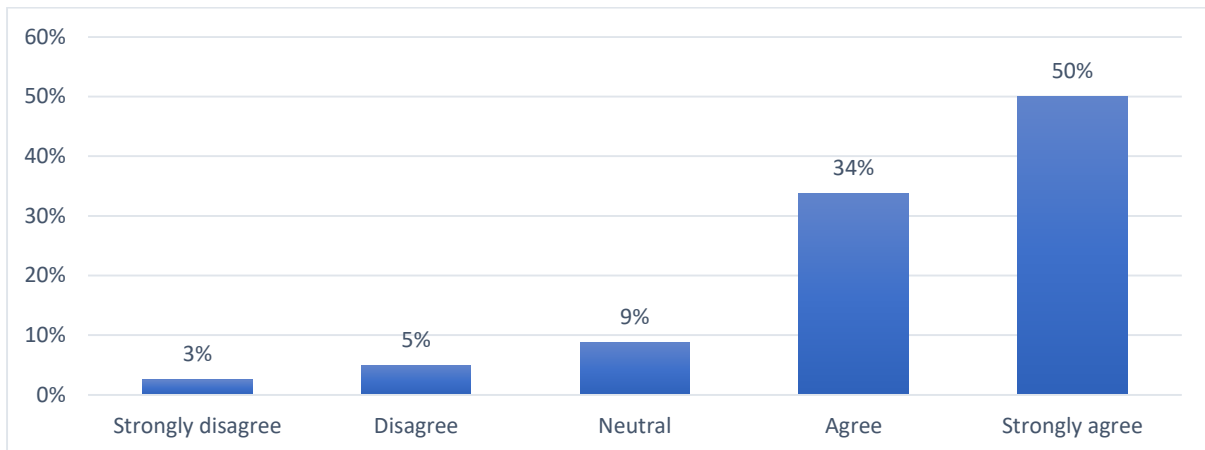


Figure 4.28 Lack of Coordination and Organisation for POE

The diagram above (Figure 4.28) highlights the findings on the lack of coordination and organisation for POE as a barrier influencing the implementation of POE. The findings are as follows: 50% of the respondents strongly agreed, 34% agreed, and 9% remained neutral. However, 5% of the respondents disagreed, while 3% strongly disagreed that a lack of coordination and organisation for POE is a barrier influencing the implementation of POE in Mpumalanga Province. The findings for this question show that most of the respondents (50%) strongly agreed that a lack of coordination and organisation for POE is a barrier influencing the implementation of POE when the numbers are combined.

4.4.23 Lack of owners' knowledge of the potential benefits of POE

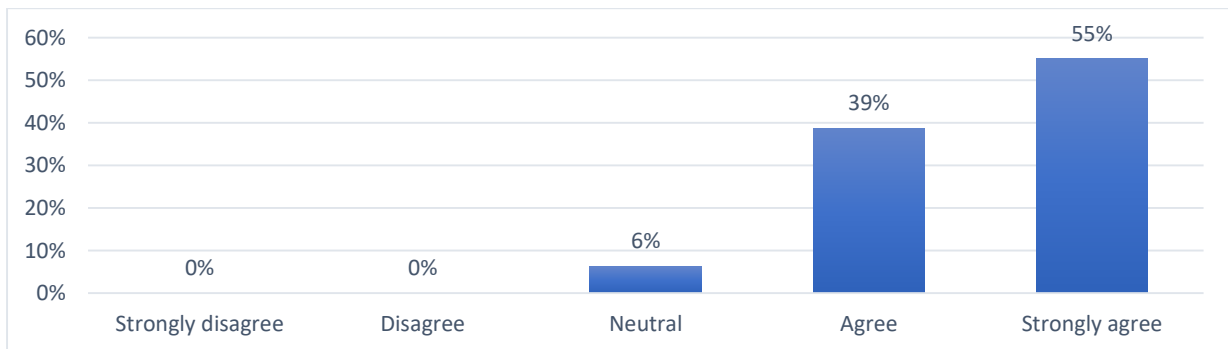


Figure 4.29 Lack of owners' knowledge of the potential benefits of POE

Figure 4.29 presents the responses that respondents gave when asked if the lack of owners' knowledge of the potential benefits of POE is a barrier influencing the implementation of POE in Mpumalanga Province. The majority of the respondents (55%) strongly agreed that the lack of owners' knowledge of the potential benefits of POE is a barrier influencing the implementation of POE. The findings of this study also reveal that 39% of the respondents agreed with the same question, while 6% remained neutral. None of the respondents strongly disagreed or disagreed that the lack of owners' knowledge of the potential benefits is a barrier influencing the implementation of POE. The finding, therefore, shows that the majority of the respondents strongly agreed that a lack of owners' knowledge of the potential benefits of POE is a barrier influencing the implementation of POE.

4.4.24 Lack of support from the municipal authorities for POE programmes

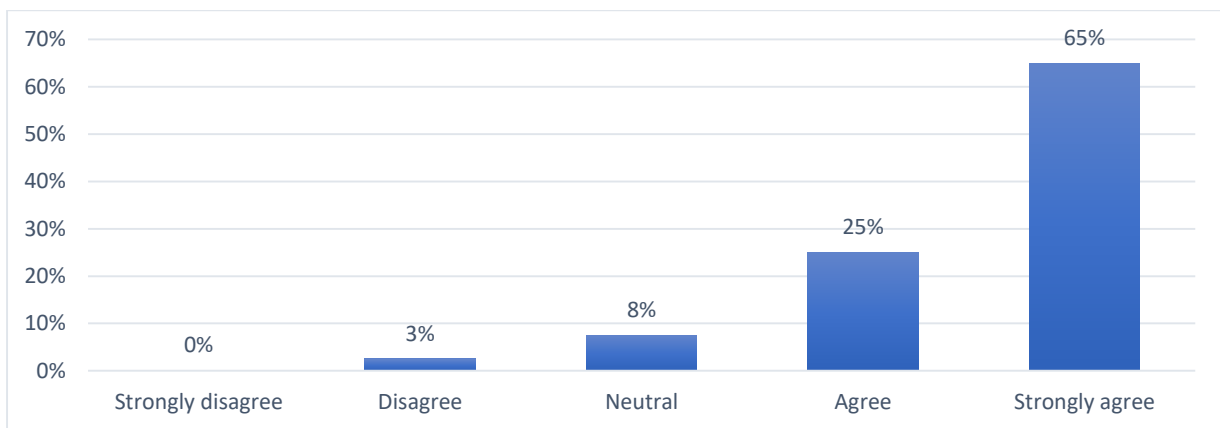


Figure 4.30 Lack of support from the municipal authorities for POE programmes

The diagrammatic representation above (Figure 4.30) shows the findings on the lack of support from the municipal authorities for POE programmes as a barrier influencing the implementation of POE. The findings show that the majority of the participants (65%) strongly agreed, 25% of the respondents agreed, while 8% remained neutral. However, 3% of the respondents disagreed, while none of the respondents strongly disagreed that the lack of support from the municipal authorities for POE programmes is a barrier influencing the implementation of POE in Mpumalanga Province. The findings for this question show that the majority of the respondents strongly agreed that a lack of support from the municipal authorities for POE programmes is a barrier influencing the implementation of POE when the numbers are combined.

4.4.25 POE is not integrated into the scope of Work of the Facility Department

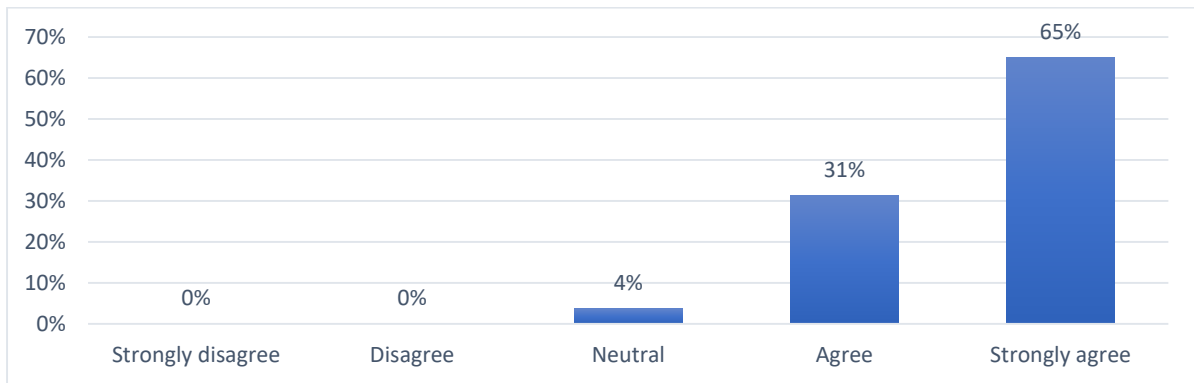


Figure 4.31 POE is not integrated into the scope of Work of the Facility Department

Figure 4.31 above shows the percentage of respondents who responded that POE is not integrated into the scope of work of the facility department and is viewed as a barrier influencing the implementation of POE. The majority of the respondents (65%) strongly agreed that POE is not integrated into the scope of work of the facility department and is a barrier influencing the implementation of POE. 31% agreed and 4% remained neutral when asked this question. The findings, therefore, show that the majority of the respondents (65%) strongly agreed that POE is not integrated into the scope of the work of the facility department and is a barrier influencing the implementation of POE in Mpumalanga Province.

4.4.26 Inaccessibility of relevant documents needed for conducting POE.

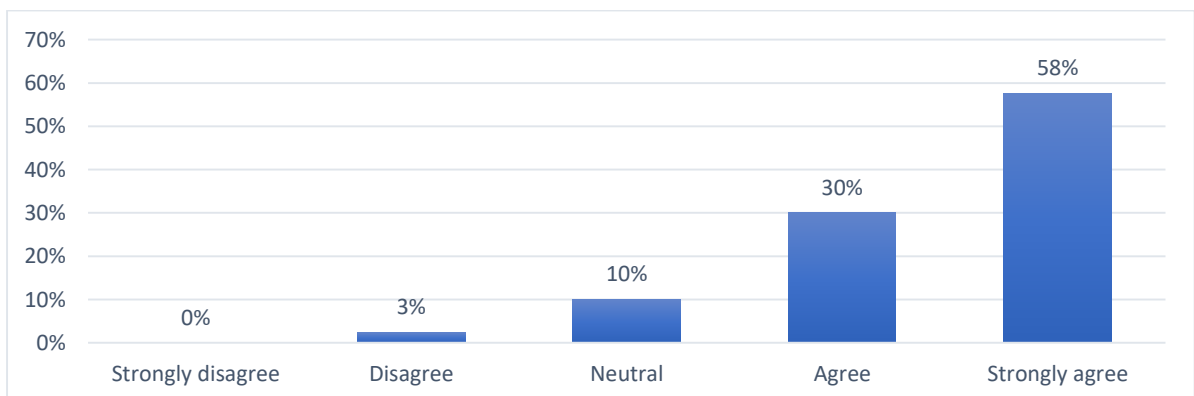


Figure 4.32 Inaccessibility of relevant documents needed for conducting POE.

Figure 4.32 shows the responses that respondents gave when asked if the inaccessibility of relevant documents needed for conducting POE was one of the barriers influencing the implementation of POE in Mpumalanga Province. The majority of the respondents (58%) strongly agreed that the inaccessibility of relevant documents needed for conducting POE is a barrier influencing the implementation of POE. Of the participants in this study, 30% agreed to the same question, while 10% remained neutral. However, 3% of the respondents disagreed that the inaccessibility of relevant documents needed for conducting POE is a barrier influencing the implementation of POE. The majority of the respondents strongly agreed that the inaccessibility of relevant documents needed for conducting POE is a barrier influencing the implementation of POE.

4.4.27 Lack of suitable industry guides/standards for conducting POE

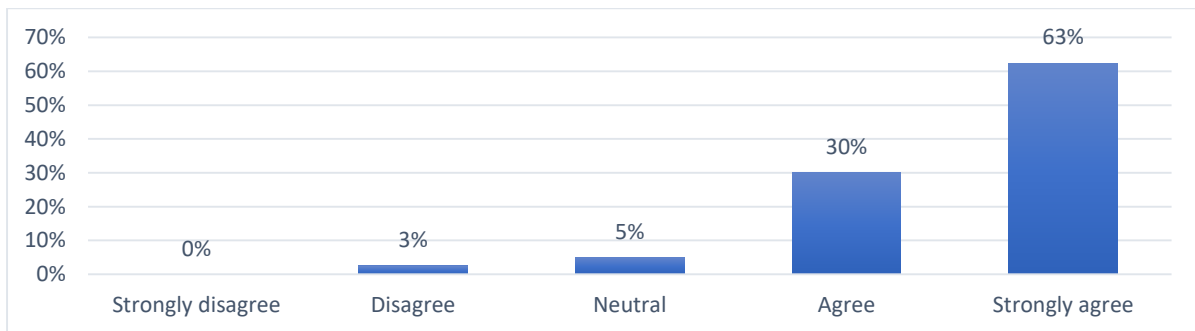


Figure 4.33 Lack of suitable industry guides/standards for conducting POE.

Figure 4.33 presents the percentage of respondents who responded to the question of whether the lack of suitable industry guides/standards for conducting POE is a barrier influencing the implementation of POE. The majority of the respondents (63%) strongly agreed that the lack of suitable industry guides/standards for conducting POE is a barrier influencing the implementation of POE. 30% of the respondents agreed, 5% remained neutral and 3% disagreed when asked the same question. The findings for this research show that the majority of the respondents (63%) strongly agreed that the lack of suitable industry guides/standards for conducting POE is a barrier influencing the implementation of POE in Mpumalanga Province.

4.4.28 Limitations of POE in the total assessment of the building's performance

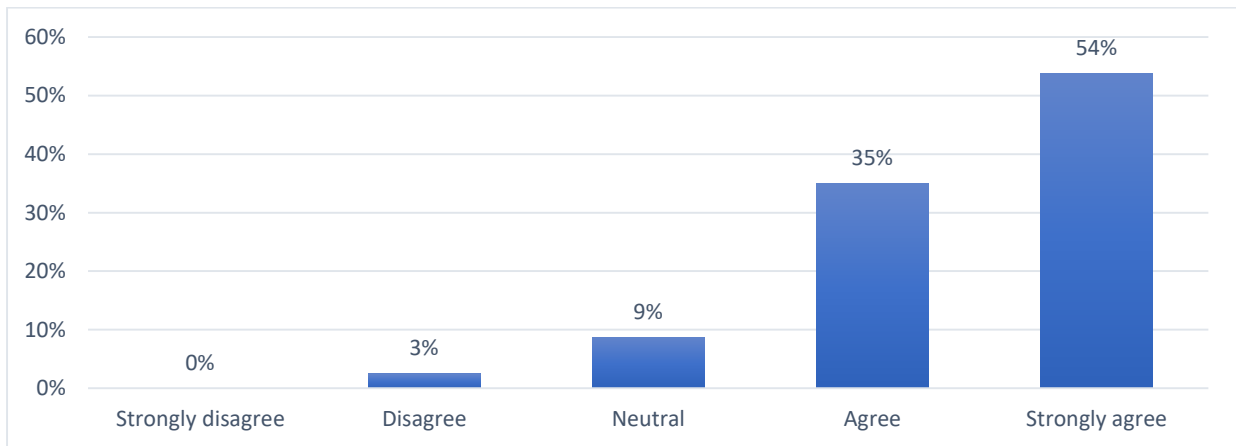


Figure 4.34 Limitations of POE in the total assessment of the building's performance

Figure 4.34 above shows the percentage of respondents who responded that the limitations of POE in the total assessment of buildings are a barrier influencing the implementation of POE. The majority of the respondents (54%) strongly agreed that the limitations of POE in the total assessment of a building's performance are a barrier influencing the implementation of POE. The findings of this study also show that 35% agreed, 9% remained neutral and 3% disagreed when asked the same question. The findings, therefore, show that for the majority of the respondents (54%), the limitations of POE in the total assessment of the building's performance are barriers influencing the implementation of POE in Mpumalanga Province.

4.4.29 Stakeholder unwillingness to assume legal responsibility for POE.

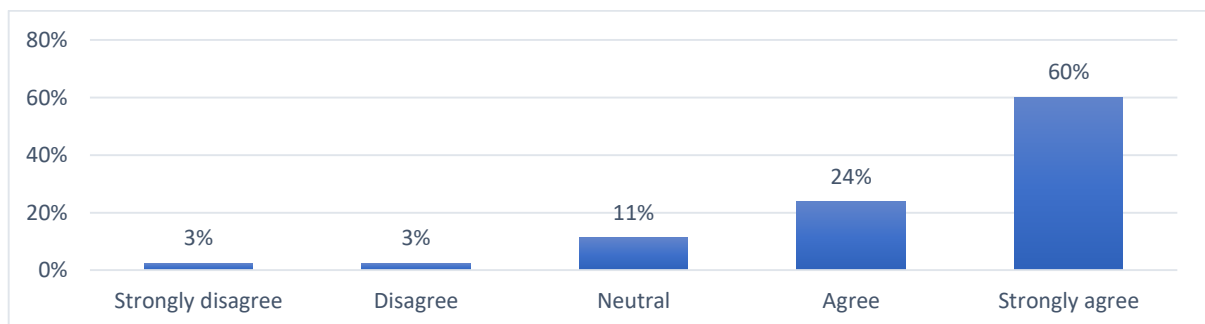


Figure 4.35 Stakeholder unwillingness to assume legal responsibility for POE.

The graph above shows the responses to the view respondents had on stakeholder unwillingness to assume legal responsibility for POE as a barrier that influences the implementation of POE in Mpumalanga Province. The majority of the participants (60%) strongly agreed that stakeholder unwillingness to assume legal responsibility is a barrier that influences the implementation of POE, while 24% of the respondents also agreed. However, 11% of the respondents remained neutral and thus could neither confirm nor deny the statement. 3% of each of the respondents agreed and strongly disagreed, respectively, to the question. The findings from Figure 4.35 show that the majority (65%) of the respondents strongly agreed that stakeholder unwillingness to assume legal responsibility for POE is a barrier that influences the implementation of POE in Mpumalanga Province.

4.5 Objective 3: Investigate the critical success factors for the effective implementation of POE

This section presents the findings that sought to investigate the critical success factors for effective implementation of post-occupancy evaluation.

4.5.1 Participation and Commitment

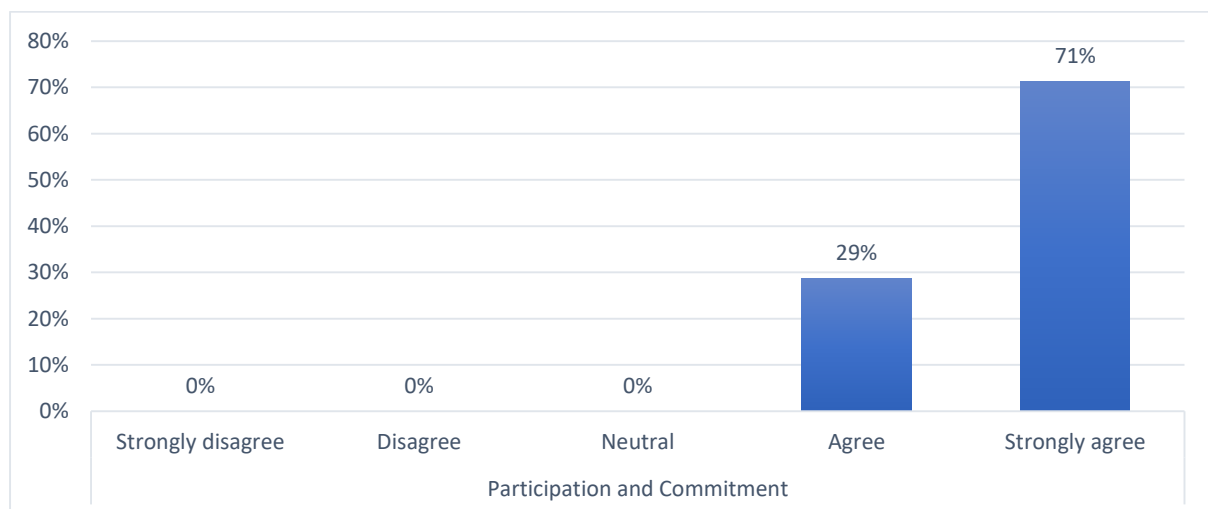


Figure 4.36 Participation and Commitment

Figure 4.36 shows the responses that were gathered from respondents when they were asked if participation and commitment are critical success factors for the effective implementation of POE in Mpumalanga Province. The majority of the respondents (71% and 29%) strongly agreed and agreed, respectively, that participation and commitment are critical success factors

for the effective implementation of POE. Figure 4.36 shows only these two responses; therefore, it can be concluded that participation and commitment are critical success factors for the effective implementation of POE in the Mpumalanga Province.

4.5.2 Leadership

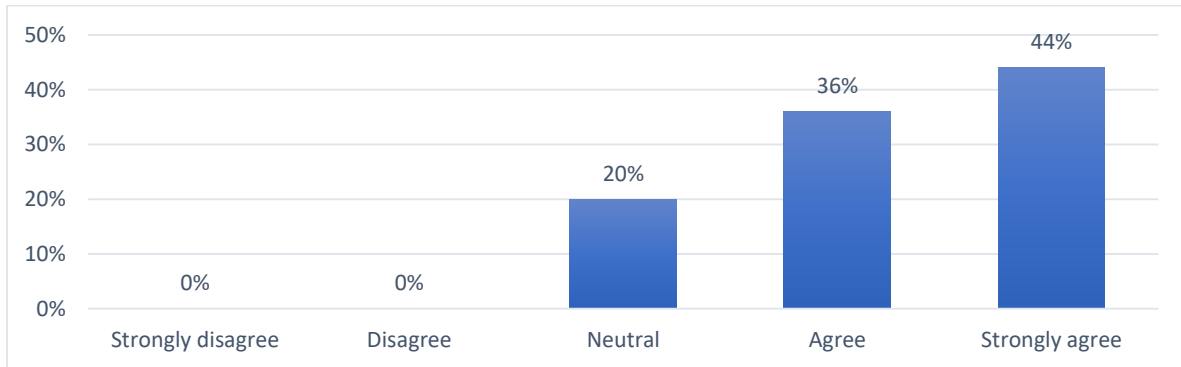
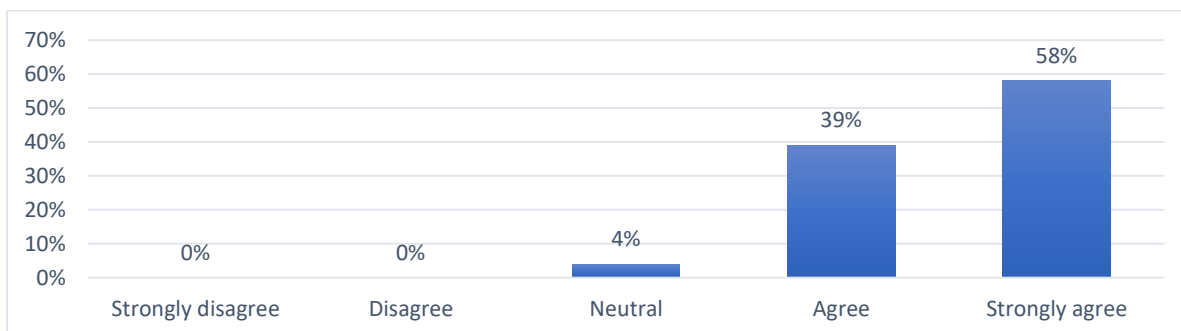


Figure 4.37 Leadership

The graph above (Figure 4.37) shows the responses to the view respondents had on leadership as a critical success factor in the implementation of POE in Mpumalanga Province. Most of the participants (44%) strongly agreed that effective leadership is a critical success factor in the implementation of POE, while 36% of the respondents also agreed. However, 20% of the respondents remained neutral and thus could neither confirm nor deny the statement. The findings from Figure 4.37 show that the majority of the respondents did see leadership as a critical success factor that leads to effective implementation of POE if those who strongly agreed and agreed are combined.

4.5.3 Education and Attitude



4.38 Education and Attitude

Figure 4.38 shows the responses participants gave when asked if education and attitude are critical success factors in the effective implementation of POE in Mpumalanga Province. The research findings show that the majority of the participants (58%) strongly agreed that it is a barrier, while 39% pointed out that they agree that education and attitude are critical success factors for the effective implementation of POE. Additionally, the graph above also shows that 4% had no comment on the question and therefore remained neutral. The findings for this question show that the majority of the respondents agreed that education and attitude are critical success factors for the effective implementation of POE in Mpumalanga Province.

4.5.4 Ownership

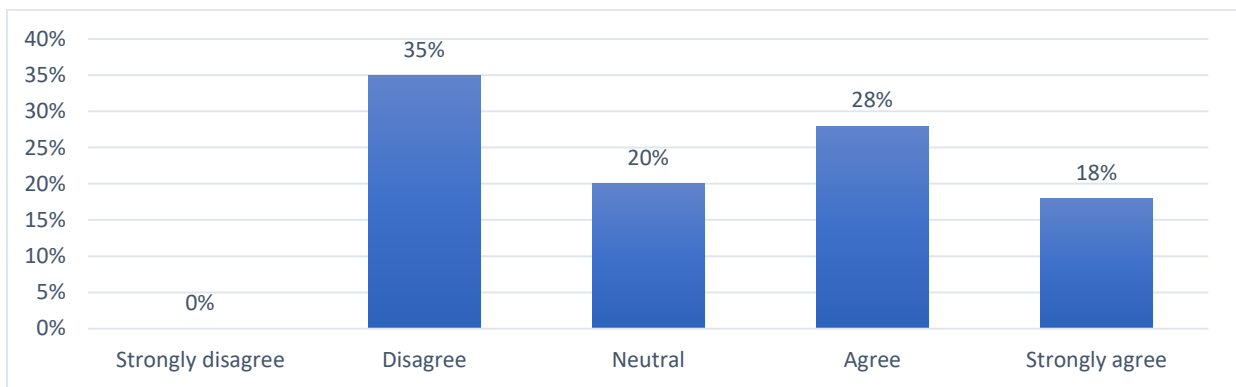


Figure 4.39 Ownership

Figure 4.39 presents the responses that respondents gave when asked if ownership is a critical success factor for the effective implementation of POE in Mpumalanga Province. 35% of the respondents disagreed that ownership is a critical success factor for the effective implementation of POE. 28% of the respondents agreed with the same question, while 20% remained neutral. Only 18% of the respondents strongly agreed that ownership is a critical success factor for the effective implementation of POE.

4.5.5 Indicators and Benchmarks

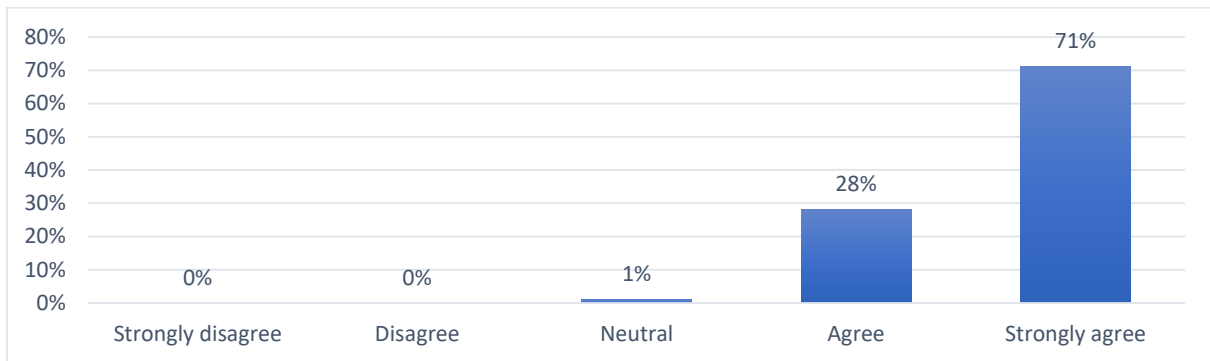


Figure 4.40 Indicators and Benchmarks

Figure 4.40 presents the responses that respondents gave when asked if indicators and benchmarks are critical success factors for the effective implementation of POE in Mpumalanga Province. The majority of the respondents (71%) strongly agreed that indicators and benchmarks are critical success factors for the effective implementation of POE. The findings of this study also reveal that 28% of the respondents agreed with the same question, while 1% remained neutral when asked the question. The finding, therefore, shows that the majority of the respondents strongly agreed that indicators and benchmarks are critical success factors for the implementation of POE in Mpumalanga.

4.5.6 Top Management Support

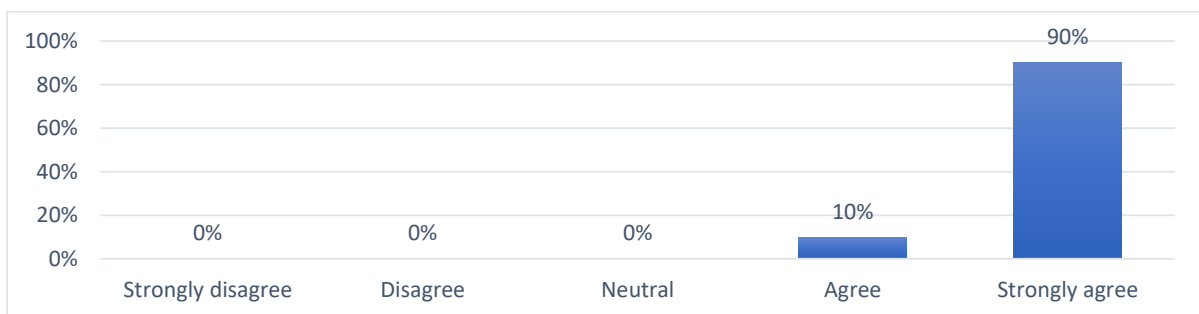


Figure 4.41 Top Management Support

Figure 4.41 presents the responses that respondents gave when asked whether top management support is a critical success factor in the effective implementation of POE in Mpumalanga Province. Participants responded either strongly agreed or agreed to this question. The majority

of the respondents (90%) strongly agreed and only 10% of the respondents agreed that top management support is a critical success factor for effective implementation of POE. The findings, therefore, show that the majority of the respondents strongly agreed that top management support is a critical success factor for the effective implementation of POE.

4.5.7 Availability of Resources

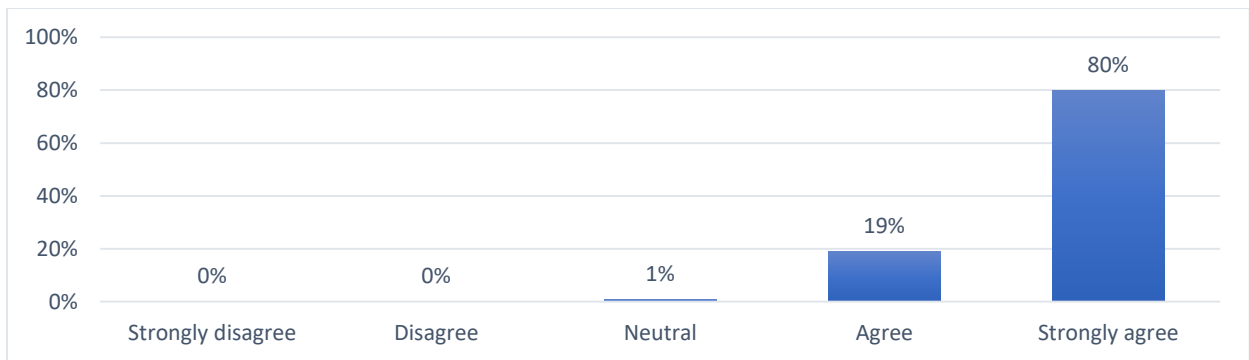


Figure 4.42 Availability of Resources

Figure 4.42 presents the responses given by respondents when asked whether the availability of resources is a critical success factor for the effective implementation of POE. The findings show that 80% strongly agreed that it is a critical success factor, while 19% agreed and 1% remained neutral. The findings, therefore, show that the majority of the respondents (80%) strongly agreed that the availability of resources is a critical success factor that leads to the effective implementation of POE in Mpumalanga Province.

4.5.8 Skills

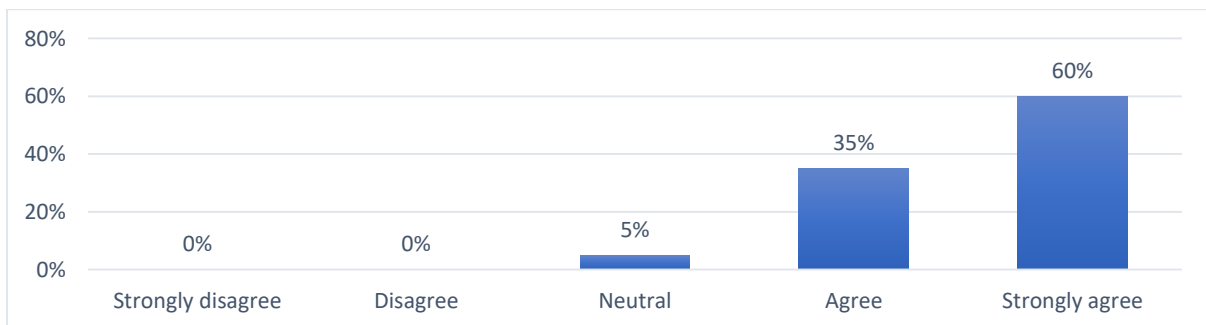


Figure 4.43 Skills

Figure 4.43 presents the from participants that highlight the significance of skills as a critical success factor for the effective implementation of POE in Mpumalanga Province. The majority of the respondents (60% and 35%) strongly agreed and agreed that skills are required for the effective implementation of POE respectively. Moreover, 5% of the respondents remained neutral when asked the question. The findings as presented in Figure 4.43 also show that the majority of the respondents (60%) see skills as a critical success factor for the effective implementation of POE in Mpumalanga Province.

4.5.9 Managing POE Information

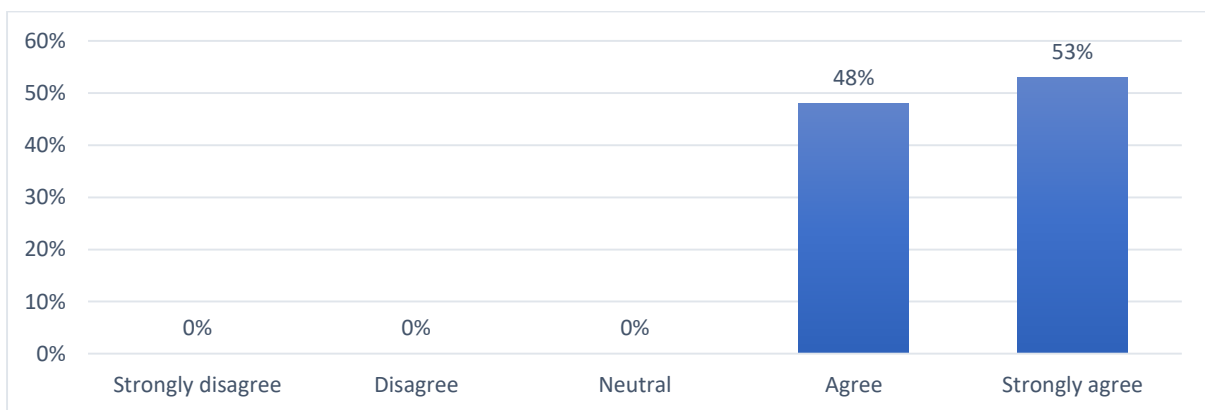


Figure 4.43 Managing POE Information

Figure 4.43 shows the responses that were gathered from respondents when they were asked if managing POE information is a critical success factor for the effective implementation of POE in Mpumalanga Province. The majority of the respondents (53%) strongly agreed, while 48% agreed that managing POE information is a critical success factor for the effective implementation of POE in the province. The findings, therefore, show that the majority of the respondents strongly agreed that managing POE information is a critical success factor for the implementation of POE in Mpumalanga Province.

4.5.10 Knowledge

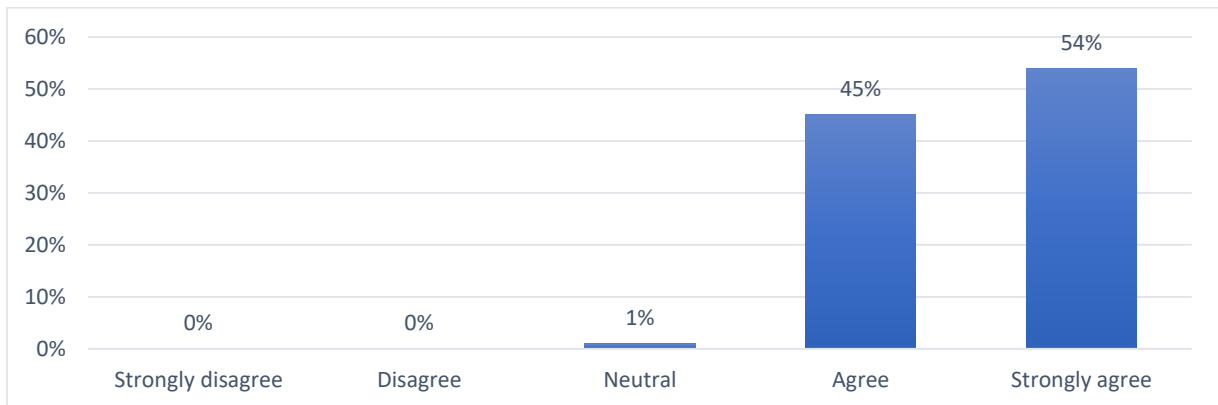


Figure 4.44 Knowledge

Figure 4.44 shows a graph that presents responses participants gave concerning knowledge as a critical success factor in the effective implementation of POE in Mpumalanga Province. The research found that 54% of the respondents strongly agreed that it is a critical success factor, while 45% of the respondents agreed that it is a critical success factor. Only 1% of the respondents remained neutral when asked the same question. The study findings for this question show that the majority of the respondents strongly agreed that knowledge is a critical success factor for the effective implementation of POE in Mpumalanga Province.

4.5.11 Access to Knowledge

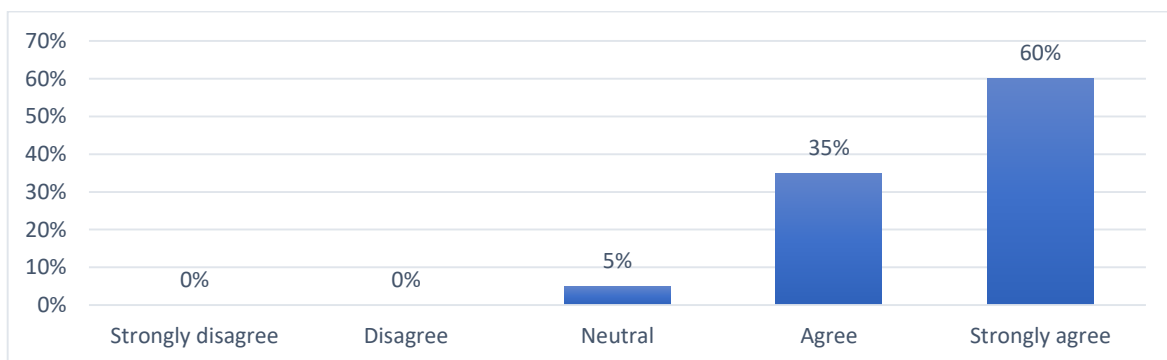


Figure 4.45 Access to Knowledge

Figure 4.45 above illustrates the participants' responses when asked about the significance of access to knowledge as a critical success factor in the effective implementation of POE in Mpumalanga Province. 60% of the respondents strongly agreed that access to knowledge is a

key factor. 35% of the respondents agreed to the same question, while 5% remained neutral on the question. The study findings on this question show that the majority of the participants see access to knowledge as a critical success factor for the effective implementation of POE in Mpumalanga Province.

4.5.12 Effective flow of feedback

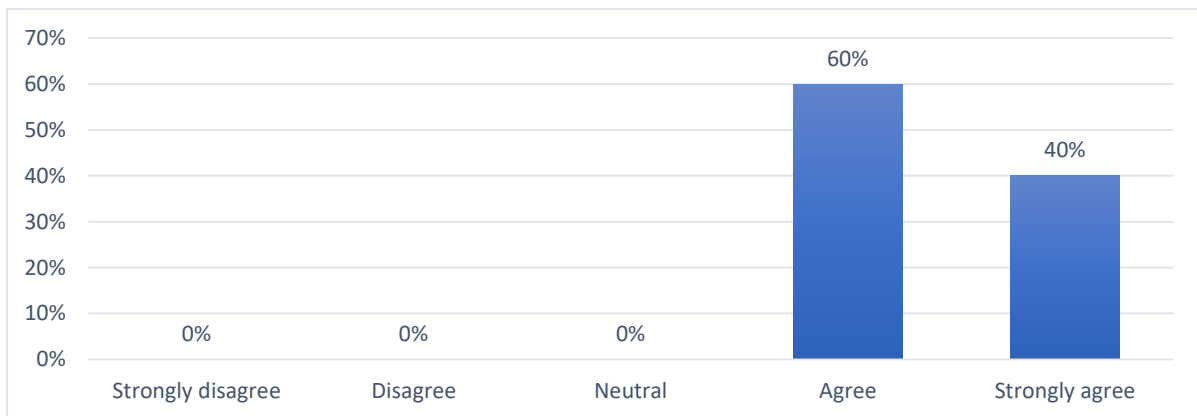


Figure 4.46 Effective flow of feedback

Figure 4.46 presents the responses provided by participants when asked if the effective flow of feedback is a critical success factor for the effective implementation of POE in Mpumalanga Province. The majority of the respondents (60%) agreed that the effective flow of feedback is a critical success factor for the effective implementation of POE. Further analysis indicates that 40% of the respondents strongly agreed with the same question and no other responses were gathered. The results conclude that the majority of the respondents agreed that the effective flow of feedback is a critical success factor for the effective implementation of POE in Mpumalanga Province.

4.6 Objective 4: Benefits of implementing post-occupancy evaluation practices

This section presents responses given by respondents when asked about the benefits of implementing post-occupancy evaluation practices. The response measures the extent to which they agree or disagree using the 5-point Likert scale rating; 1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; 5 = strongly agree.

4.6.1 Used in determining building defects

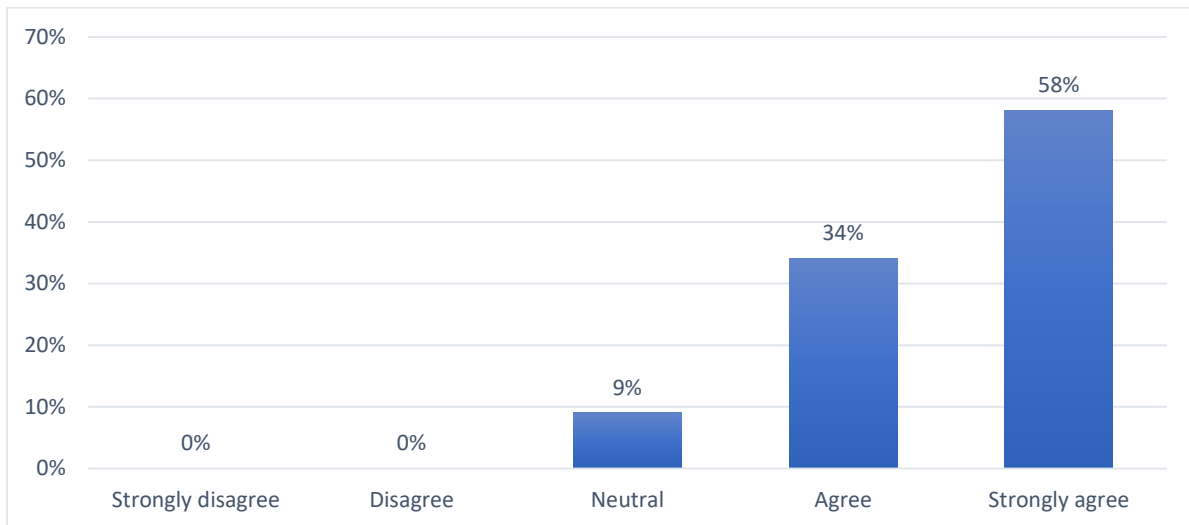


Figure 4.48 Used in determining building defects.

Figure 4.48 presents the responses that respondents gave when asked if determining building defects was a benefit of implementing post-occupancy evaluation practices in Mpumalanga Province. Fifty-eight percent (58%) of the respondents strongly agreed it was a benefit, while 34% of the respondents agreed to the same question. Only 9% remained neutral and thus could neither agree nor disagree. A careful look at the results shows that the majority of the respondents strongly agreed that a benefit of POE practices is determining building defects in Mpumalanga Province.

4.6.2 Formulating design and construction criteria

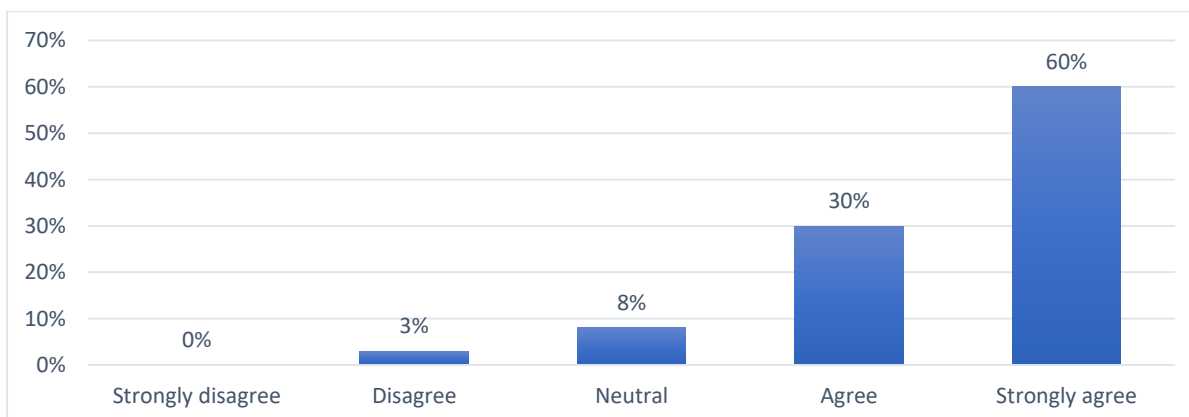


Figure 4.49 Formulating design and construction criteria

Figure 4.49 above shows the percentage of respondents who responded to the question of whether a benefit of POE practices is formulating design and construction criteria. 60% of the respondents strongly agreed that formulating design and construction criteria is a benefit derived from POE practices. Thirty percent (30%) simply agreed, 8% remained neutral and 3% disagreed when asked the same question. The findings, therefore, show that the majority of the respondents (60%) strongly agreed a benefit of POE practices is that they help in formulating design and construction criteria in Mpumalanga Province.

4.6.3 Supporting performance measures for assets and facility management.

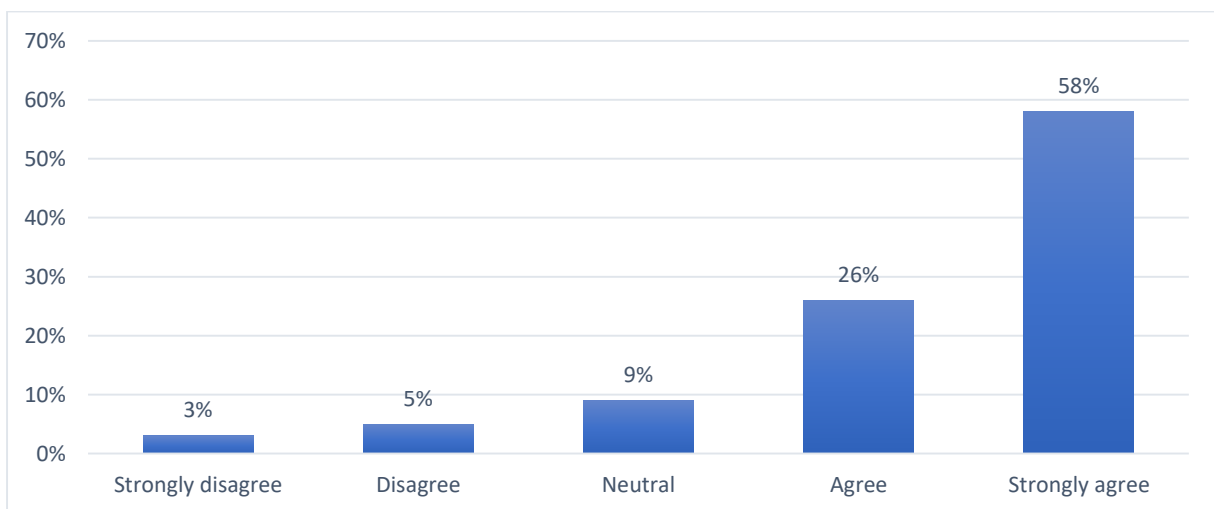


Figure 4.50 Supporting performance measures for assets and facility management.

The graph above (Figure 4.50) shows the view respondents had on supporting performance measures for assets and facility management as a benefit derived from POE practices in Mpumalanga Province. The majority of the participants (58%) strongly agreed that POE practices have the benefit of supporting performance measures for assets and facility management. Twenty-six percent of the respondents agreed, while 9% remained neutral and thus could neither confirm nor deny the statement. However, 5% and 3% of the respondents disagreed and strongly disagreed, respectively, on the benefits of POE practices. The findings from Figure 4.50 indicate that the majority of the respondents see POE practices as having the benefit of supporting performance measures for assets and facility management.

4.6.4 Lowering facility life cycle costs by identifying design errors.

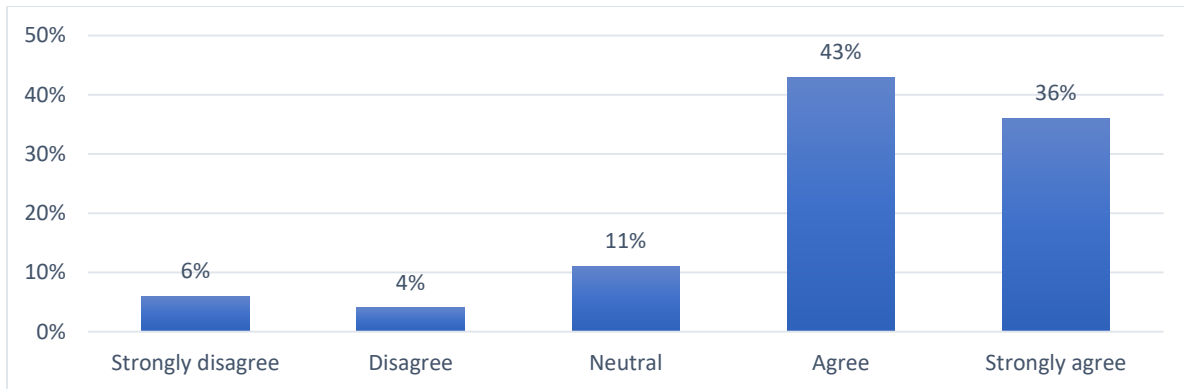


Figure 4.51 Lowering facility life cycle costs by identifying design errors.

Figure 4.51 illustrates participants' responses when asked if lowering facility life cycle costs and identifying design errors was a benefit realised from POE practices in Mpumalanga Province. The research findings show that 43% of the respondents agreed that it was a benefit, while 36% strongly agreed. However, 11% of the respondents remained neutral, while 6% strongly disagreed and 4% disagreed that it was not a benefit of POE practices. The study found that most of the participants (43%) agreed and (36 %) strongly agreed that lowering facility life cycle costs by identifying design errors was a benefit derived from having POE practices in Mpumalanga Province.

4.6.5 Reduce the cost of maintenance and operating costs.

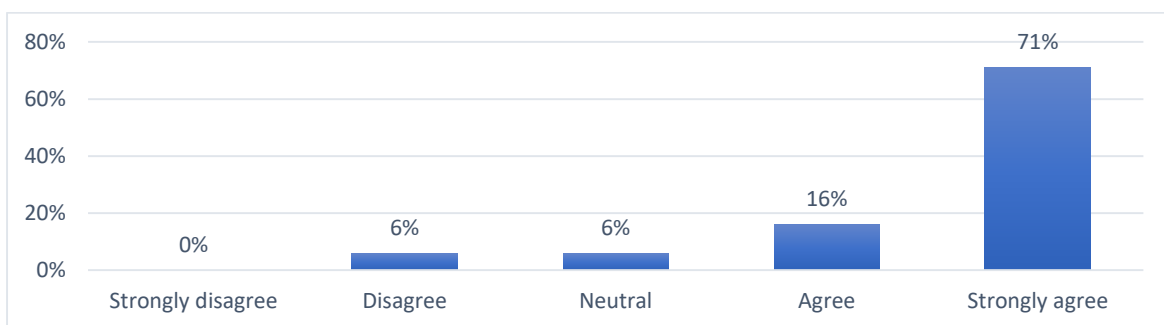


Figure 4.52 Reduce the cost of maintenance and operating costs.

Figure 4.52 above presents the responses that were gathered from respondents when asked if POE practices have the benefit of reducing the cost of maintenance and operating costs in Mpumalanga Province. The study found that 71% of the respondents strongly agreed that it was a benefit, while 16% of the respondents agreed to the same question. However, 6% had no comment and remained neutral 6% equally indicated that they disagreed that it was a benefit derived from POE practices. From the findings above we can see that the majority of the respondents (71%) strongly agreed that the reduction of cost of maintenance and operating costs can be realised when POE practices are present in Mpumalanga Province.

4.6.6 Provides a mechanism for understanding the mutual interaction between buildings and users’ aspirations.

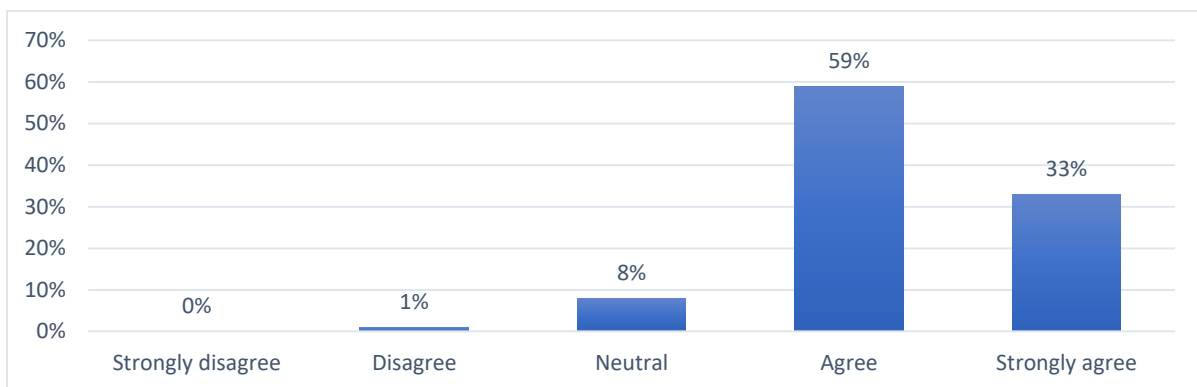


Figure 4.53 Provides a mechanism for understanding the mutual interaction between buildings and users’ aspirations.

The graph above (Figure 4.53) illustrates respondents’ perceptions of POE practice of providing a mechanism for understanding the mutual interaction between buildings and the aspirations of the users in Mpumalanga Province. The majority of the participants (59%) agreed that POE practices have the benefit of providing a mechanism for understanding the mutual interaction between buildings and users’ aspirations. 33% of the respondents strongly agreed, while 8% of the respondents remained neutral and thus could neither confirm nor deny the statement. However, 1% of the respondents disagreed with this possible benefit of POE practices. The findings from Figure 4.53 highlight that the majority of the respondents did see POE practices as having the benefit of providing a mechanism for understanding the mutual interaction between buildings and users’ aspirations.

4.6.7 Proposes ways of improving the environment.

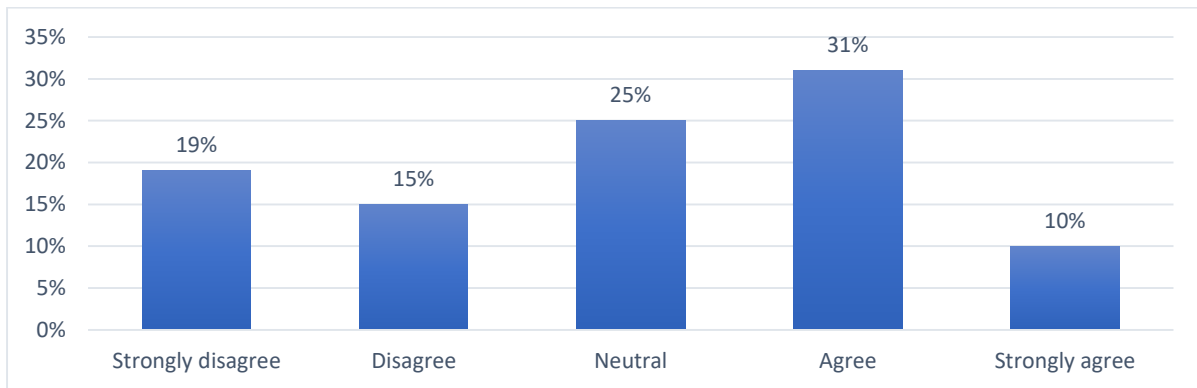


Figure 4.54 Proposes ways of improving the environment.

Figure 4.54 above shows the percentage of respondents who responded to the question of whether POE practices have the benefit of proposing ways of improving the environment. 31% of the respondents agreed with this benefit, 25% remained neutral, 19% strongly disagreed, 15% disagreed and 10% strongly agreed when asked the same question. The findings, therefore, show that most of the respondents (31%) agreed that POE practices have the benefit of proposing ways to improve the environment.

4.6.8 Enhance continuous improvement processes.

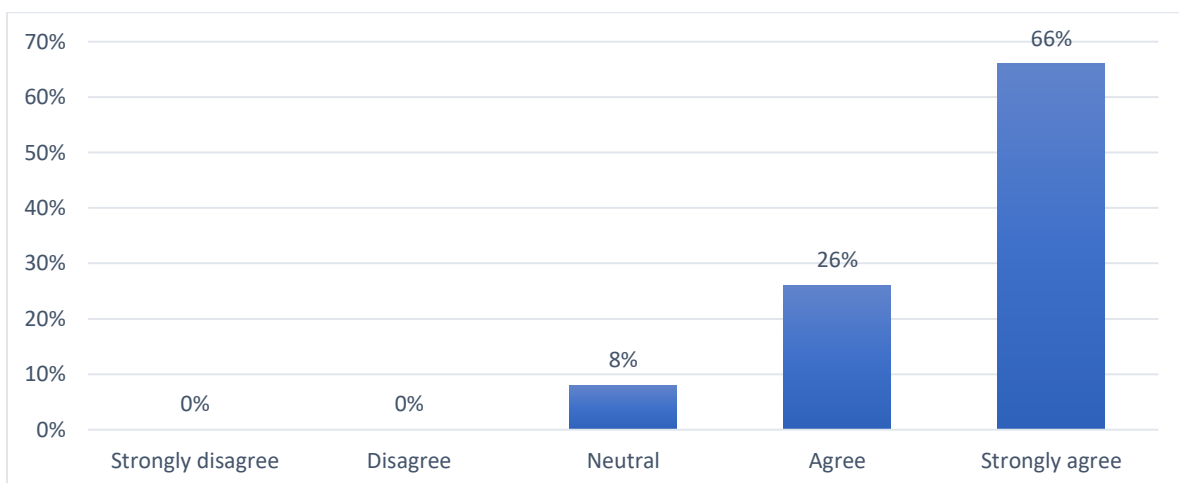


Figure 4.55 Enhance continuous improvement processes.

Figure 4.55 above shows the percentage of respondents who responded to the question of whether POE practices have the benefit of enhancing continuous improvement processes in

Mpumalanga Province. The majority of the respondents (66%) strongly agreed that POE practices enhance the continuous improvement process in the province. 26% of the respondents agreed while, 8% remained neutral when asked the same question. The findings, therefore, show that the majority of the respondents (66%) believe that POE practices enhance continuous improvement processes in Mpumalanga Province.

4.6.9 Improved fit between occupants and their buildings

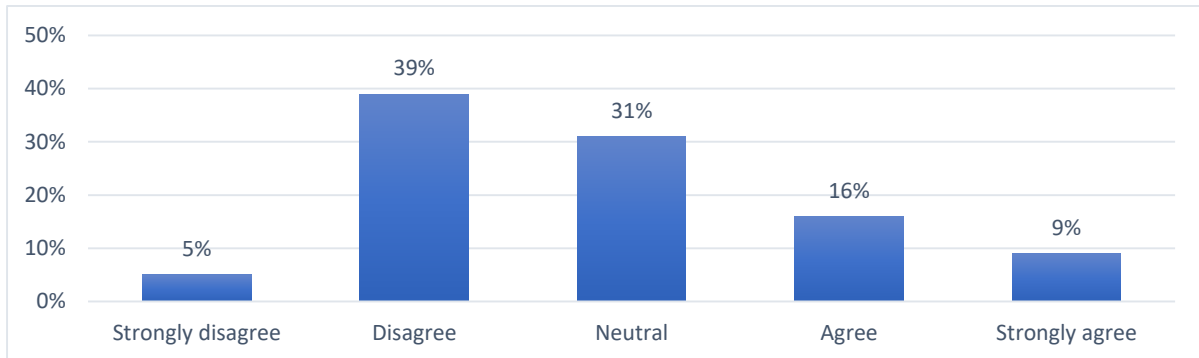


Figure 4.56 Improved fit between occupants and their buildings

Figure 4.56 above shows the percentage of respondents who responded to the question of whether improved fit between occupants and their buildings is a benefit derived from POE practices. The study found that 39% of the respondents disagreed that it has this benefit, 31% remained neutral, 16% agreed, 9% strongly agreed and 5% strongly disagreed when asked the same question. The findings, therefore, show that most of the respondents (39%) disagreed that POE practices have the benefit of improving the fit between occupants and their buildings in Mpumalanga Province.

4.6.10 Optimisation of service to suit occupants.

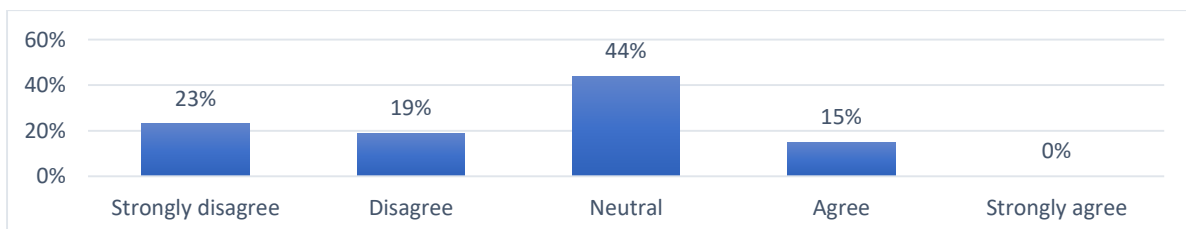


Figure 4.57 Optimisation of service to suit occupants.

Figure 4.57 above shows the percentage of respondents who responded to the question of whether POE practices have the benefit of optimising services to suit occupants in Mpumalanga Province. Most of the respondents (44%) remained neutral stating that POE practices optimise service to suit occupants. The study found that 23% of the respondents strongly disagreed, while 19% disagreed when asked this question. Only 15% of the respondents indicated that POE practices have the benefit of optimising service to suit occupants. The findings, therefore, show that most of the respondents (44%) remained neutral on this question, and mixed feelings exist on the optimisation of service to fit occupants as a benefit derived from POE practices.

4.6.11 Reduction of waste of space and energy

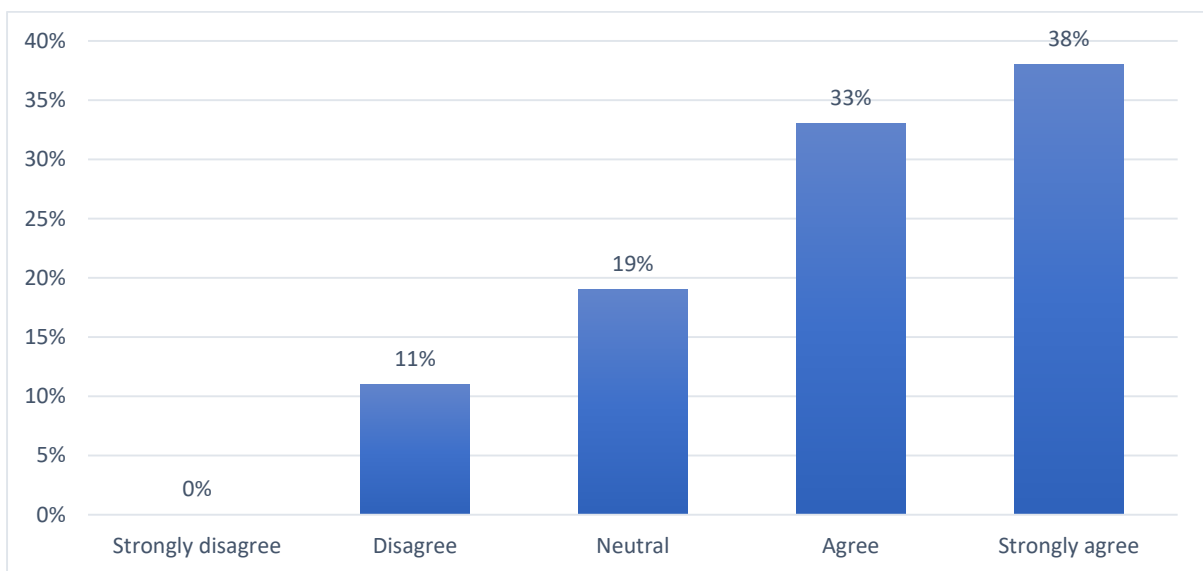


Figure 4.58 Reduction of waste of space and energy

The graph above (Figure 4.58) shows the responses to the view respondents had on POE practices having the benefit of reducing waste of space and energy in Mpumalanga Province. Most of the participants (38%) strongly agreed that POE practices have the benefit of reducing waste of space and energy. 33% of the respondents agreed, while 19% of the respondents remained neutral and thus could neither confirm nor deny the statement. However, 11% of the respondents disagreed with this statement on POE practices. The findings from Figure 4.58 highlight that most of the respondents did see POE practices as having the benefit of reducing waste of space and energy.

4.6.12 Validation of occupants' real needs

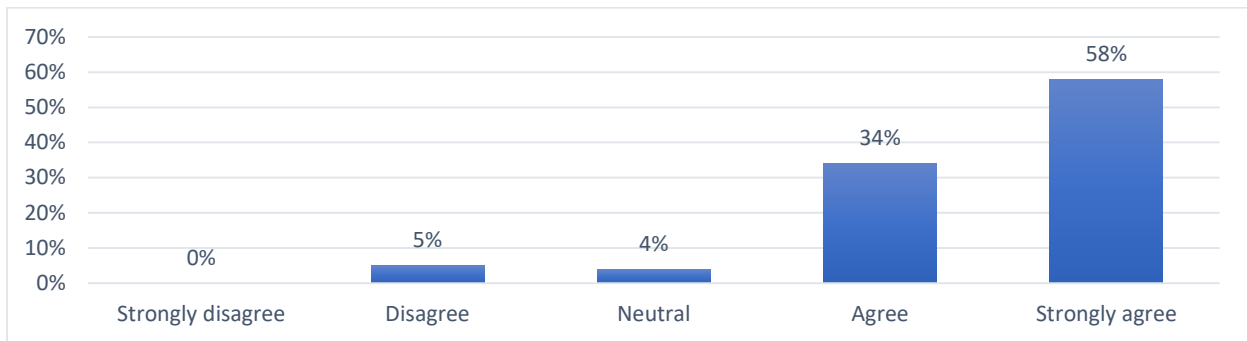


Figure 4.59 Validation of occupants' real needs

Figure 4.59 above shows the responses that were gathered from respondents when asked if POE practices have the benefit of validating occupants' real needs in Mpumalanga Province. The study found that 58% of the respondents strongly agreed that it was a benefit while 34% of the respondents agreed to the same question. However, 4% of the respondents had no comment and remained neutral while 5% of the respondents indicated that they disagreed that it was a benefit derived from POE practices. From the findings above we can see that the majority of the respondents (58%) strongly agreed that the validation of occupants' real needs can be realised when POE practices are present in Mpumalanga Province.

4.6.13 Reduced ownership/ operational expenses

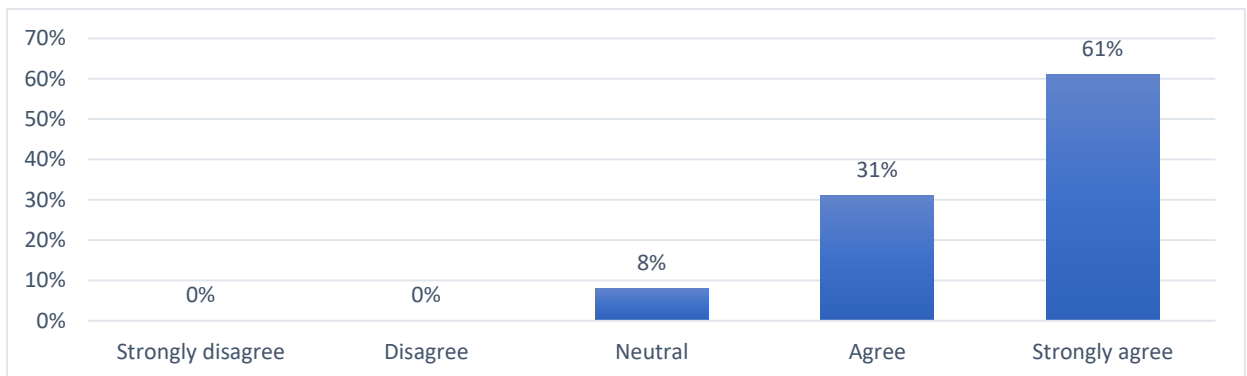


Figure 4.60 Reduced ownership/operational expenses

Figure 4.60 above shows the percentage of respondents who responded to the question of whether POE practices have the benefit of reducing ownership/operational expenses in Mpumalanga Province. The majority of the respondents (61%) strongly agreed that POE

practices reduce ownership/operational expenses in the province. The study also found that 31% of the respondents agreed, while 8% remained neutral when asked the same question. The findings, therefore, show that the majority of the respondents (61%) believe that POE practices reduce ownership or operational expenses in Mpumalanga Province.

4.6.14 Improved competitive advantage in the marketplace

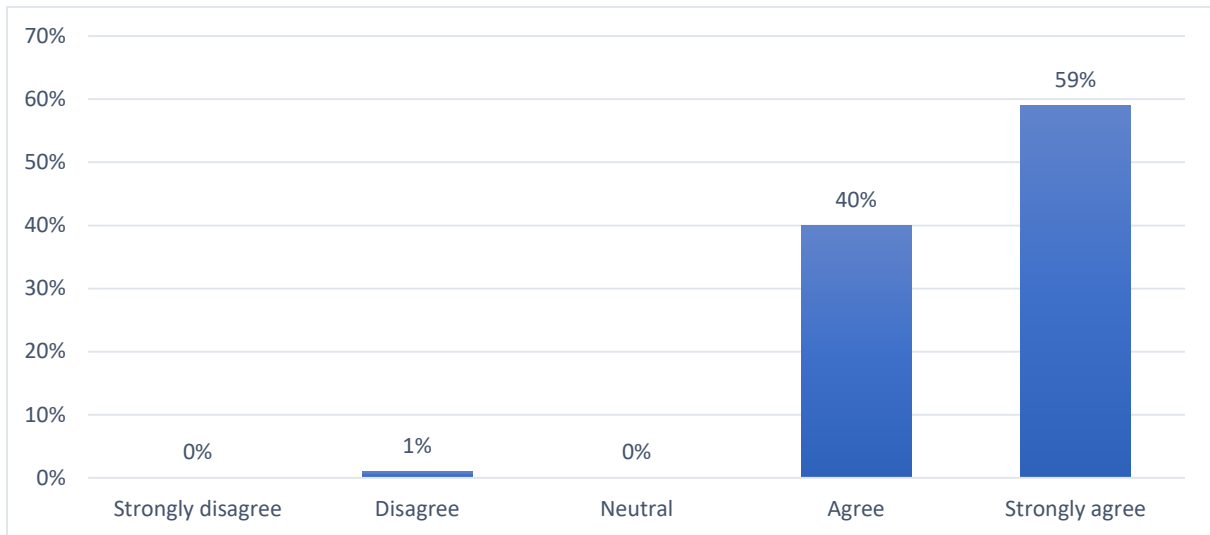


Figure 4.61 Improved competitive advantage in the marketplace

Figure 4.61 above shows the responses gathered from respondents when asked if POE practices have the benefit of improving competitive advantage in the marketplace in Mpumalanga Province. The study found that 59% of the respondents strongly agreed that it was a benefit, while 40% of the respondents agreed to the same question. However, 1% of the respondents indicated that they disagreed that it was a benefit derived from POE practice. From the findings above, we can see that the majority of the respondents (59%) strongly agreed that POE practices have the benefit of improving competitive advantage in the marketplace in Mpumalanga Province.

4.6.15 Provision of detailed information about the building

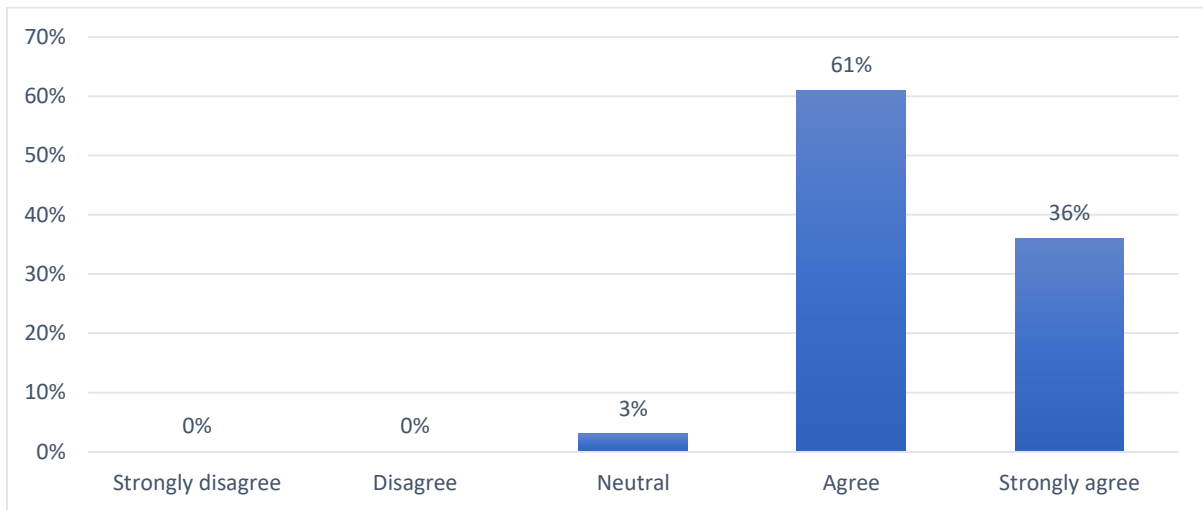


Figure 4.62 Provision of detailed information about the building

Figure 4.62 above presents the responses gathered from respondents when asked if the provision of detailed information about the buildings is a benefit of POE practice in Mpumalanga Province. The study found that 61% of the respondents agreed that it was a benefit, while 36% of the respondents strongly agreed with the same question. However, 3% had no comment and remained neutral. The findings above reveal that the majority of the respondents (61%) agreed that the provision of detailed information about the buildings can be realised when POE practices are present in Mpumalanga Province.

4.6.16 Basis for decision making and policy-making.

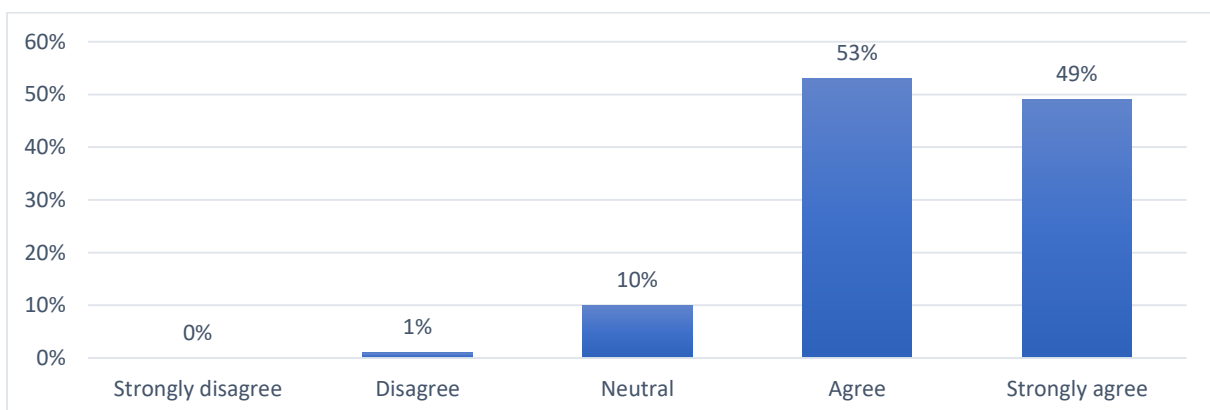


Figure 4.63 Basis for decision making and policy-making.

Figure 4.63 above shows the percentage of respondents who responded to the question of whether POE practices have the benefit of providing a basis for decision-making and policy making in Mpumalanga Province. The majority of the respondents (53%) agreed that POE practices provide a basis for decision-making and policy-making. The study also found that 49% of the respondents strongly agreed, while 10% remained neutral when asked the same question. Only 1% of the respondents disagreed that POE practices provide a basis for decision-making and policy-making. The findings, therefore, show that the majority of the respondents (53%) believe that POE practices provide a basis for decision-making and policy-making in Mpumalanga Province.

4.6.17 Support for the Development of Design and Planning Guides

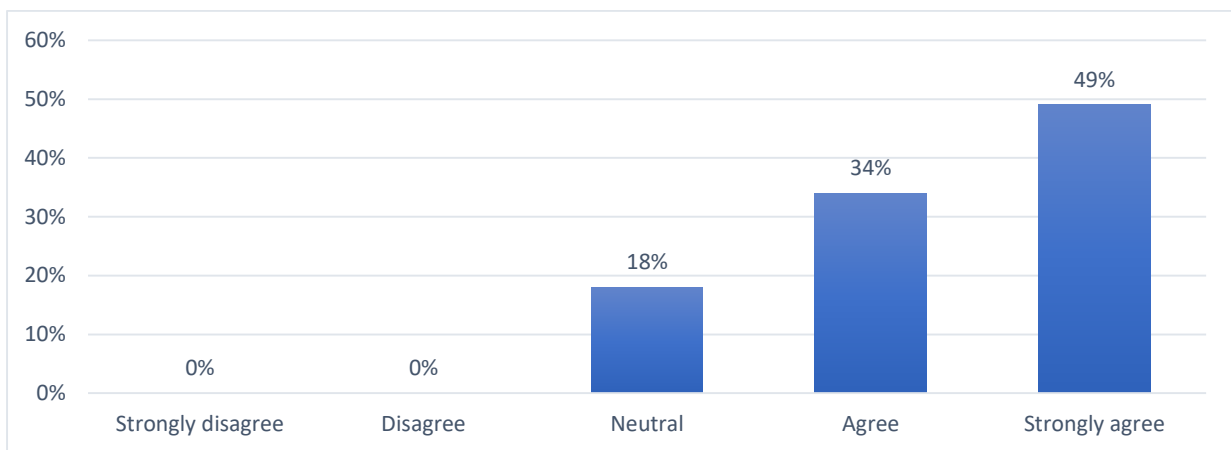


Figure 4.64 Support for the development of design and planning guides

Figure 4.64 above shows the percentage of respondents who responded to the question of whether POE practices have the benefit of supporting the development of design and planning guides. The study found that 49% of the respondents strongly agreed it has this benefit, 34% agreed, and 18% of the respondents remained neutral when asked this question. The findings, therefore, show that most of the respondents (49%) strongly agreed that POE practices have the benefit of supporting the development of design and planning guides.

4.6.18 Better communication among designers, clients, facility managers and end-users

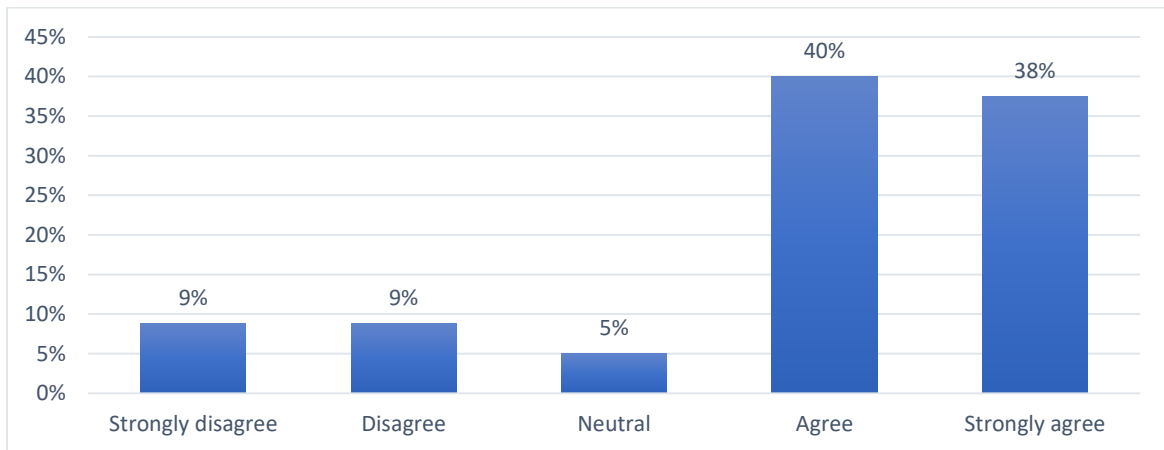


Figure 4.65 Better communication among designers, clients, facility managers and end-users

Figure 4.65 above shows the percentage of respondents who responded to the question of whether POE practices have the benefit of enhancing better communication among designers, clients, facility managers and end-users. The study found that 40% of the respondents agreed it has this benefit, 38% of the respondents strongly agreed, and 5% of the respondents remained neutral when asked this question. However, 9% of the respondents equally disagreed and strongly disagreed when asked about this benefit. The findings, therefore, show that most of the respondents (40%) agreed that POE practices have the benefit of enhancing better communication among designers, clients, facility managers and end-users in Mpumalanga Province.

4.6.19 Identify new requirements.

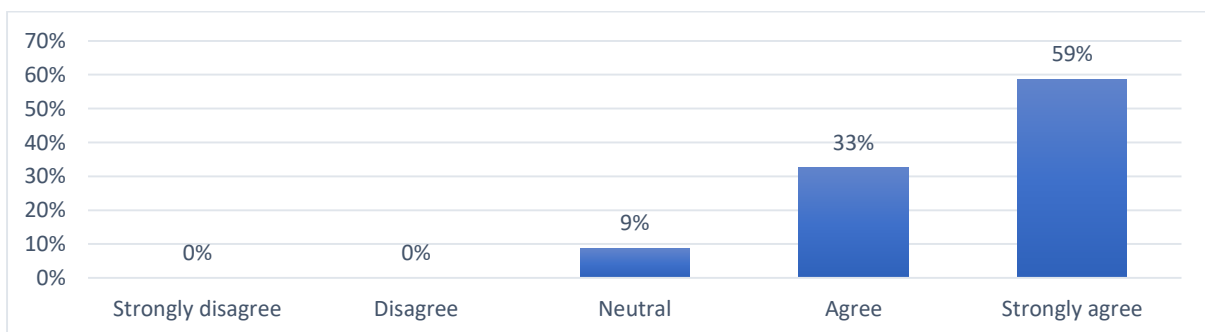


Figure 4.66 Identify new requirements.

Figure 4.66 above shows the responses that were gathered from respondents when asked if POE practices have the benefit of identifying new requirements in Mpumalanga Province. The study found that 59% of the respondents strongly agreed that it was a benefit, while 33% of the respondents agreed to the same question. However, only 9% of the respondents chose to remain neutral when given the chance to respond to this question. From the findings above, we can see that the majority of the respondents (59%) strongly agreed that POE practices have the benefit of identifying new requirements in Mpumalanga Province.

4.6.20 Function and provide the basis for the necessary changes

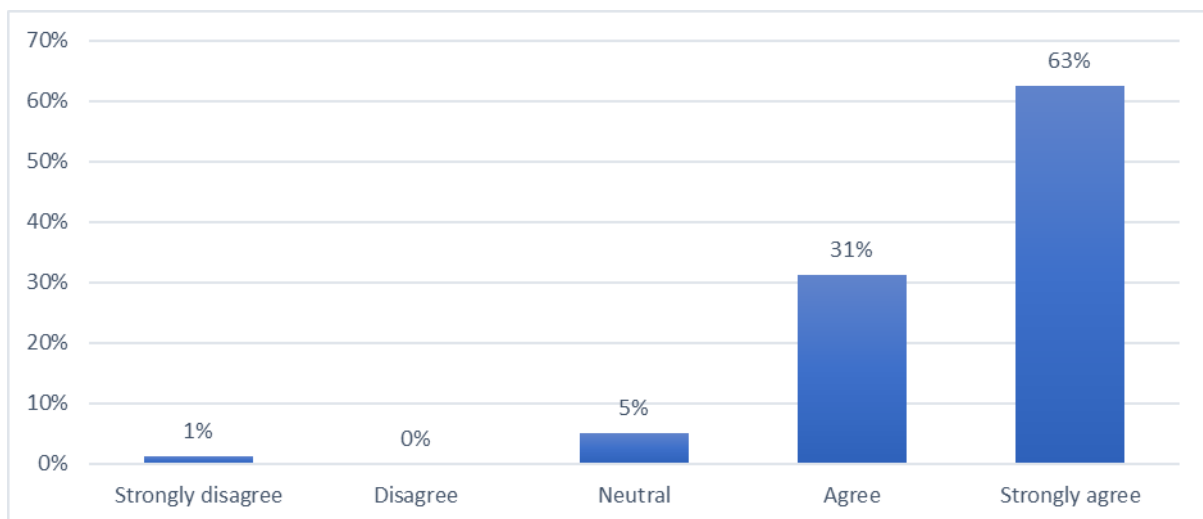


Figure 4.67 Function and provide the basis for the necessary changes

Figure 4.67 above shows the percentage of respondents who responded to the question of whether POE practices have the benefit of providing the basis for the necessary changes. The study found that 63% of the respondents strongly agreed it has this benefit, 31% agreed and 5% of the respondents remained neutral when asked this question. However, only 1% of the respondents strongly opposed the idea that providing the basis for the necessary changes was a benefit of POE. The findings, therefore, show that the majority of the respondents (63%) strongly agreed that POE practices have the benefit of functioning and providing the basis for the necessary changes in Mpumalanga Province.

4.6.21 Increase design know-how

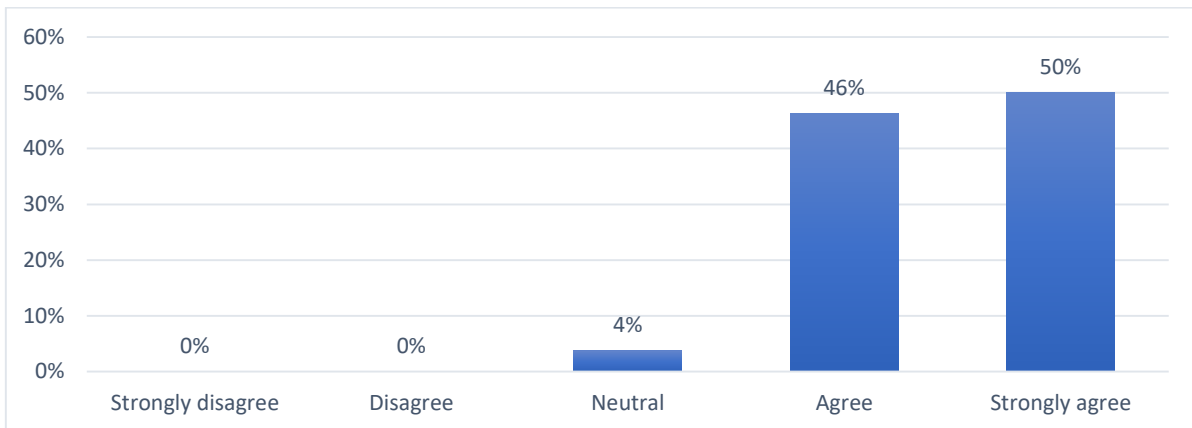


Figure 4.68 Increase design know-how

The graph above (Figure 4.68) shows the responses to the view respondents had on POE practices having the benefit of increasing design know-how in Mpumalanga Province. Most of the participants (50%) strongly agreed that POE practices have the benefit of increasing design know-how. Additionally, the study found that 46% of the respondents agreed, while 4% remained neutral and thus could neither confirm nor deny the statement. The findings from Figure 4.68 highlight that most of the respondents did see POE practices as having the benefit of increasing design know-how.

4.6.22 Reduce whole-life environment impact.

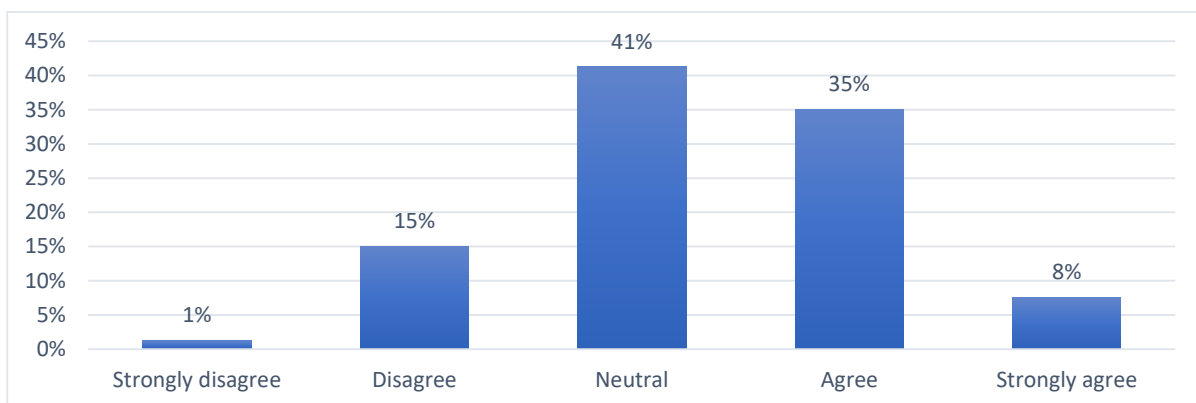


Figure 4.69 Reduce whole-life environment impact.

Figure 4.69 above shows the responses gathered from respondents when asked if POE practices have the benefit of reducing whole-life environmental impacts in Mpumalanga Province. The study found that 41% of the respondents remained neutral, with 35% of the respondents agreeing that it was a benefit, while 8% of the respondents strongly agreed. However, 15% of the respondents disagreed with the same question while 1% of the respondents indicated that they strongly disagreed that it was a benefit derived from POE practice. From the findings above, we can see that mixed reactions exist; moreover, most of the respondents remained neutral.

4.6.23 Ensures the Sustainability of building performance.

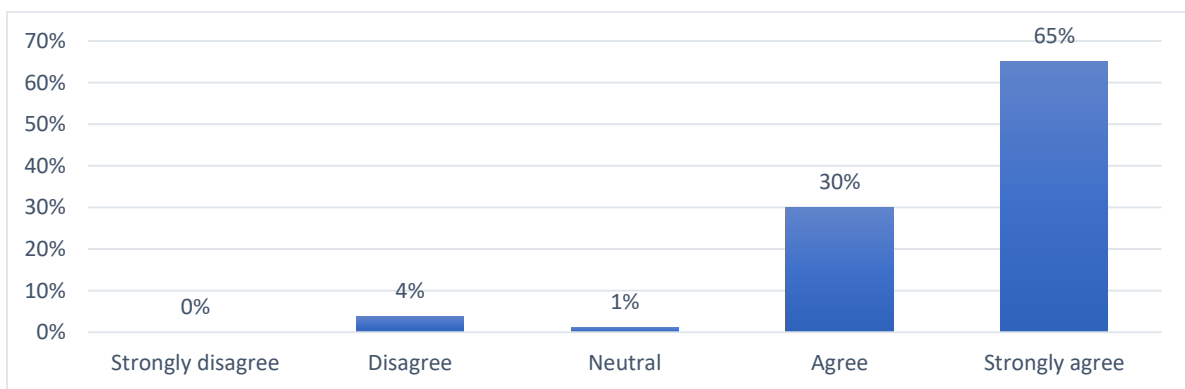


Figure 4.70 Ensures the sustainability of building performance.

The diagram above (Figure 4.70) shows participants' responses to POE practices, which have the benefit of ensuring the sustainability of building performance in Mpumalanga Province. The majority of the participants (65%) strongly agreed that POE practices have the benefit of ensuring the sustainability of building performance. The research also found that 30% of the respondents agreed, while 1% remained neutral and thus could neither confirm nor deny the statement. However, only 4% of the respondents disagreed with this statement on the benefits of POE practices. The findings from Figure 4.70 highlight that the majority of the respondents (65%) did see POE practices as having the benefit of ensuring the sustainability of building performance.

4.6.24 Lowers Facility life cycle costs

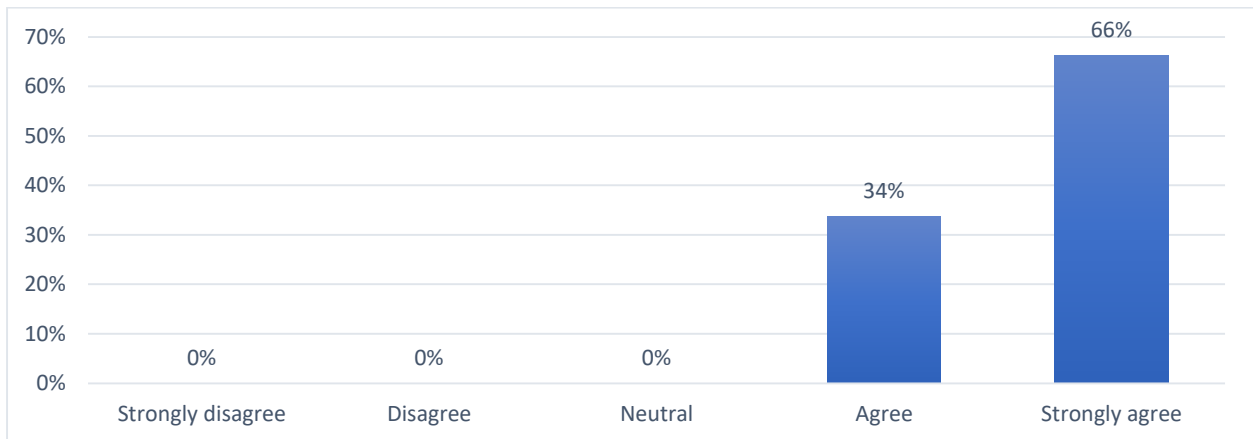


Figure 4.71 Lowers facility life cycle costs

Figure 4.71 above shows the percentage of respondents who responded to the question of whether POE practices have the benefit of lowering facility life cycle costs. The study found that the majority of the respondents (66%) strongly agreed that it has this benefit, and 34% agreed when asked this question. The findings, therefore, show that the majority of the respondents (66%) strongly agreed that POE practices have the benefit of lowering facility life cycle costs in Mpumalanga Province.

4.6.25 Increase in Occupant Satisfaction

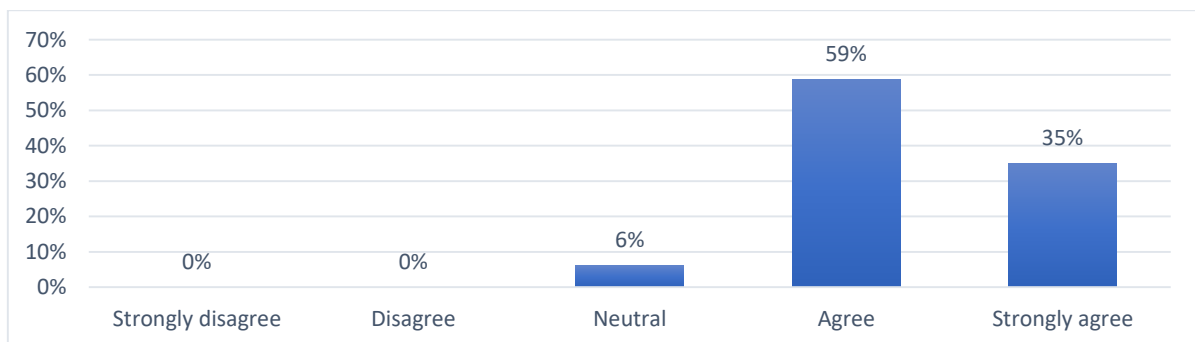


Figure 4.72 Increase Occupant Satisfaction

The graph above (Figure 4.72) shows the responses to the view respondents had on POE practices having the benefit of increasing occupants' satisfaction in Mpumalanga Province. The majority of the participants (59%) agreed that POE practices have the benefit of increasing

occupants' satisfaction. Additionally, the study also found that 35% of the respondents strongly agreed, while 6% remained neutral and thus could neither confirm nor deny the statement. The findings from Figure 4.72 reveal that the majority of the respondents did see POE practices as having the benefit of increasing occupants' satisfaction.

4.6.26 Continuous improvement of quality and performance of facilities

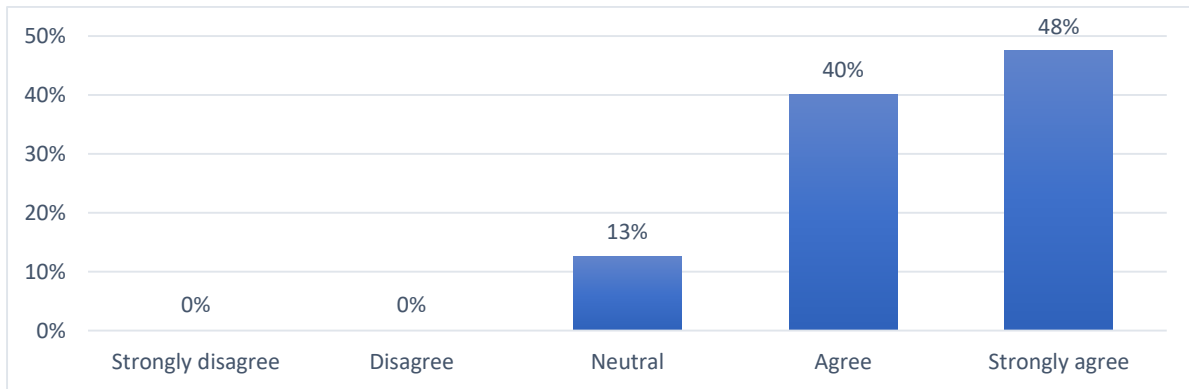


Figure 4.73 Continuous improvement of quality and performance of facilities

Figure 4.73 shows the percentages of respondents' perceptions that POE practices have the benefit of continuously improving the quality and performance of facilities in Mpumalanga Province. Most of the participants (48%) strongly agreed that POE practices have this benefit. The findings also reveal that 40% of the respondents agreed, while 13% remained neutral and thus could neither confirm nor deny the statement. The findings from Figure 4.73 highlight that most of the respondents did see POE practices as having the benefit of continuously improving the quality and performance of facilities in Mpumalanga Province.

4.6.27 Improves building performance.

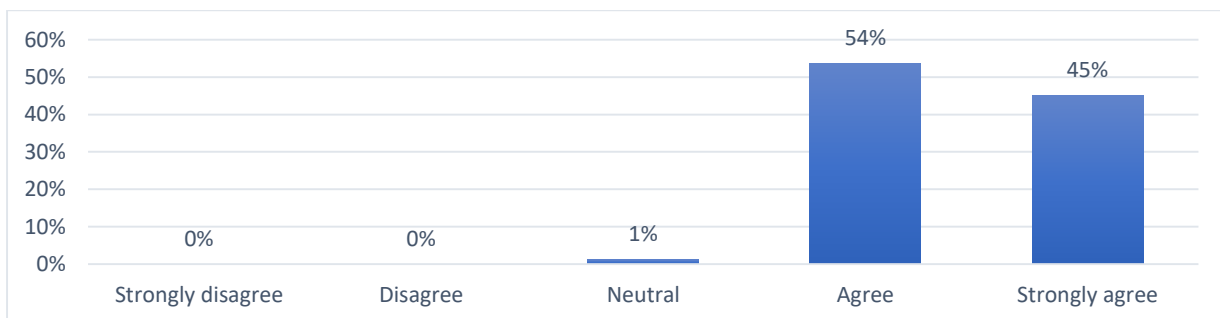


Figure 4.74 Improves building performance.

Figure 4.74 above shows the percentage of respondents who responded to the question of whether POE practices have the benefit of improving building performance in Mpumalanga Province. The study found that 54% of the respondents agreed it has this benefit, while 45% strongly agreed. However, only 1% of the respondents remained neutral when asked this question. The findings, therefore, show that the majority of the respondents agreed that POE practices have the benefit of improving building performance in Mpumalanga Province.

4.7 Conclusion

Chapter Four presented the data for this study and interpreted the findings. The findings were organised into background data and objectives 1 to 4. The responses that were given show the barriers to POE implementation, the critical success factors for effective POE implementation, and the benefits of having POE practices. The next chapter provides an analysis and discussion of the above findings.

CHAPTER 5

Discussion of Findings

5.1 Introduction

The previous chapter presented and interpreted the data that was collected for this study. Chapter 5 provides an analysis of the data and also draws on information from the literature review, making way for conclusions to be drawn. Similarities and differences in the data collected against the literature are carefully analysed. Different sets of questions are merged, having identified the commonalities between them. Additionally, the data analysis follows the discussion of findings in the previous chapter. The data is thematically analysed after coding and creating themes for the data. The objectives of this study were to:

- i. Investigate the current state of post occupancy evaluation practice in Mpumalanga.
- ii. Investigate the barriers influencing the implementation of post-occupancy evaluation practices.
- iii. Investigate the critical success factors for effective implementation of post occupancy evaluation.
- iv. Determine the benefits of post-occupancy evaluation practices in Mpumalanga Province.

The chapter now moves to analyse funding as a critical success factor for the effective implementation of POE in Mpumalanga Province.

5.2 Objective 1

This section discusses the findings for objective one.

Current state of post-occupancy evaluation in housing in Mpumalanga

The provision of housing has been a problem worldwide, and South Africa is no exception. Although the South African government has been delivering housing, the issue of low standards of housing has been raised. study found that the government has noted this and has tried to shift from its focus on quantity to quality. The government has tried to use the post-occupancy evaluation tool to remedy the situation, but questions about whether it is being fully

utilised have been raised. There was no doubt among the respondents to this study that they were aware of post-occupancy evaluation's existence in Mpumalanga Province. This was shown by all the respondents agreeing to this.

However, there was a slight drop in awareness of this evaluation being conducted on RDP buildings. There was a 10% drop in the number of those who indicated that they were aware of POE practices in Mpumalanga Province. The close-ended nature of the questionnaire could not probe further why this was the case. It could mean the participants did not understand the question or that POE is not taken seriously in the province. More research is required to ascertain this.

5.3 Objective 2

This section discusses the findings for objective two.

Investigate the barriers influencing the implementation of post-occupancy evaluation practices

The study established that if there is a lack of support from top management and other senior managers, POE cannot be effective. This assertion was shown in Figure 4.27, with a majority of the respondents strongly agreeing. Figure 4.41 also shows that top management support is a critical success factor for the effective implementation of POE, with all respondents agreeing to this. This argument was further reinforced by respondents who indicated that inadequate coordination and organisation of POE activities have a detrimental impact on the overall process. If managerial support is lacking and various departments involved in the process fail to collaborate, the execution of POE is compromised. Figure 4.28 shows that 50% strongly agreed and 34% agreed that lack of coordination and organisation for POE is a barrier to the effective implementation of the process. The study corroborates Woon, et al. (2015), who contend that one of the key success factors for POE is that management has to support the process in all phases. Once that is done, all the departments and officials that conduct POE need to work together and also be involved in the planning and process for the success of POE. Any disagreements have to be managed properly for the programme to go on, as it is key to improving future designs and performance (Choi and Moon, 2017).

The findings of this study also show that another area of concern as far as management is concerned is their preference to increase income at the expense of POE. This is a sabotaging process, as it would clearly show that they are not taking POE seriously. Figure 4.26 shows that when management increases income at the expense of POE activities, it is a barrier that affects the effective implementation of POE. To show support for the programme, incentives should be given to conduct POE, as this enables the frequency of conducting this activity. This was also shown by this study, as the lack of these incentives was indicated to be a barrier influencing the effective implementation of the programme (see Figure 4.21). A look at Figure 4.37 further reinforces that leadership or top management is key in POE. This is because the majority of the respondents indicated that leadership is a critical factor that leads to the effective implementation of POE.

The barriers that were noted in the study are a lack of performance indicators and information feedback. POE practices, like any project, require objectives to be set, and from there, performance indicators are developed. As was noted earlier, Ozoh, et al. (2022) argue that there are about nine indicators that can be focused on in POE; however, these can be classified into three: functional performance, technical and environmental, and economic performance. If these are not analysed or set from the start, POE is not effectively implemented. However, the findings of the study show a different picture when looking at the barriers to POE. This is because the respondents in Figure 4.10 show that most of the respondents (36%) strongly agreed and 34% agreed that the lack of agreed and reliable indicators does not influence the implementation of POE in Mpumalanga Province. Additionally, the respondents move in the same direction as far as information feedback is concerned. Figure 4.22 shows that most of the participants also highlighted that information feedback does not affect POE implementation. This diverges from Queensland's (2007) study, as the author contends that information feedback is a key area that is required in POE as it informs and supports future evaluation.

Taking a look at the findings in Figure 4.24, it is evident that the majority of the participants agreed that a lack of knowledge of POE procedures and processes is one of the barriers that negatively affects the implementation of post-occupancy evaluations. This was shown by 55% of the respondents who strongly agreed and 33% of the respondents who simply agreed. The Housing Act of 1997 gives a clear emphasis that standards need to be followed in building houses, and divergence from such standards is prohibited. Similarly, the National Home Builders Registration Council (NHBRC) and the Construction Industry Development Board

(CIDB) take this position as well. The NHBRC, which was established in 1997, seeks to protect homeowners from contractors who construct poor houses with shoddy workmanship. The argument the researcher seeks to make here and is also drawn from these regulatory bodies is that if one is tasked with conducting the POE, they have to have a clear understanding of the regulation and legislation to conduct the task effectively. It thus follows that POE procedures are derived from such, and a clear understanding of this is key (Mazibuko, Simpeh and Smallwood 2021). According to Mazibuko, et al. (2021), building contractors have significantly contributed to the violation of the set standards, and this means POE should be taken seriously. The material used and labour should be of excellent quality, as required by the NHBRC. Intricately linked to the above is the lack of trained practitioners in POE. Results in Figure 4.13 show that close attention should be paid to the lack of trained practitioners when conducting the POE. The results show that most of the participants (35%) strongly agree, and 30% of respondents agree that when those tasked with conducting POE lack training, the process is also futile. Thus, it follows that trained personnel for the POE have to be adequately trained to know the aforementioned regulations and procedures set out for the POE. Failure to do this, as the results show, negatively affects the whole POE. Additionally, the results in Figure 4.20 were also consistent with what was found in the training of practitioners of POE. The result in this figure shows that the majority of respondents (68%) strongly agreed that POE exclusion from the professional curriculum affects POE implementation. All three results from Figures 4.13, 4.20 and 4.24 show that municipalities and officials tasked with POE need to understand the guidelines and procedures and also need to be trained well.

It should be noted that incentives are key in any operation as the literature has shown. These enable motivation to conduct a task in any organisation and POE is not excluded from requiring this. The results of the study show that the majority of the respondents (63%) remained neutral when the question of incentives was asked; however, 34% agreed that split incentives can be a barrier that influences the implementation of POE in Mpumalanga Province (see Figure 4.17). On the issue of split incentives, more probing is required to ensure a better understanding of this aspect in POE.

The study, however, could not establish this, as shown above. Moreover, looking at fragmented incentives and benefits (Figure 4.14), most of the respondents show that having fragmented incentives and benefits does not influence the implementation of POE in Mpumalanga Province. Thirty-six percent of the respondents strongly disagreed and 30% simply disagreed

that fragmented incentives and benefits within the procurement and operation processes are a barrier influencing the implementation of POE.

The number of players involved in the POE process can affect the entire POE process. If a project has many players working on the same issue, it has the effect of delaying the process and working against each other, as the results in Figure 4.16 show. Most of the respondents highlighted that an issue that influences the implementation of POE is the number of entities or players involved. Thirty-four percent of the respondents strongly agreed that the sheer number of players involved is a barrier influencing the implementation of POE, while 28% simply agreed that the sheer number of players involved has a direct influence on the implementation of POE. The results suggest that if many players are involved, the process does not go as scheduled, as different teams might have different values and ways of doing things.

5.4 Objective 3

The following are the top critical success factors for the effective implementation of POE: top management support, availability of resources, participation and commitment, effective information feedback, proper management of POE information and access to knowledge. The three least critical success factor that were also identified are leadership, education, and ownership. The availability of resources is key to any project, whether in the private or public sector. The findings of the study, as given earlier in Figure 4.42, highlight that the participant sees the availability of resources as a key success factor for the effective implementation of POE in Mpumalanga. The responses that were gathered on the issue of resources were in the majority, with 80% of the respondents supporting this idea. A look at Figure 4.23 shows that one of the barriers that respondents noted is the lack of adequate resources, which contribute to the poor implementation of POE practices. Additionally, Figure 4.30 further reinforces the argument that resources are key in the implementation of programmes such as POE. This was shown by the fact that the majority of the participants in this study (65%) noted that a lack of municipal or government support in the implementation of POE practices can be a challenge. It is common knowledge that when such institutions do not support a programme, the allocation of resources is also limited.

As was noted in the literature, the main problem affecting RDP housing is mainly the issue of funding. Dlamini and Reddy (2018) commenting on integrated development plans, highlight

that funding by the provincial government should always be in place if the programmes or initiatives they wish to achieve to be realised. This then corroborates Nkabane and Nzimakwe's (2017) argument that there is a need to prioritise and allocate enough resources if government projects are to be successful. This then matches the data that was gathered for this study as noted above.

The government needs to allocate enough resources and ensure that proper budgets are allocated, especially for the implementation of projects. POE is one such project that needs enough resources for the departments and officials working on to effectively do their job. The study concludes that funding is key, highlighting that a deficiency in financial support leads to the inefficacy of the POE. It can thus be concluded that government funding is a key issue that needs to be taken into account when discussing POE, as such evaluations need to be financially oiled to drive them well. The resources also need to be available for the evaluation process from start to finish for the programme to be effective. Without feedback, areas that require improvements are not communicated, and each set in POE requires this (Morris et al. 2020). Similarly, Hadjril and Crozier (2009) posit that feedback is key in POE as it informs the construction companies and officials involved on the areas that require improvement. Preiser, et al. (2015) cited in Ratnasari and Sudradjat, (2023) also take the same position by arguing that the process ensures that there is constant development in the design and construction to meet the needs of the occupants. Figure 4.46 is in line with this, as all participants agreed that an effective flow of feedback is a critical success factor for the effective implementation of POE in Mpumalanga Province. Similarly, Figure 4.40 shows that the majority of the respondents (71%) strongly agreed that the indicators and benchmarks are critical success factors for the effective implementation of POE.

A common theme observed in the literature that was analysed in this study is community engagement or participation of occupants and those responsible for delivering the services. As noted in Chapter 4, in Figure 4.36, 71% of the respondents highlighted that this is a key critical success factor. The results indicate that when this factor is not taken into account POE in Mpumalanga Province does not achieve its intended goals. Similarly, access to knowledge was also noted to be a critical success factor for participation and engagement to take place because when knowledge flows well, everyone gets to know what is to be done, and it also contributes to ideas that benefit POE. This corroborates Allen's (2017) argument that bottom-up strategies should be developed before housing projects are started. According to Allen (2017), those who

develop these projects should ensure that community members are consulted and engaged, and this can be through outreach programmes or sending letters to inform possible occupants about the decisions and plans they have. Boiral (2017) notes that beneficiaries are usually informed at later stages; however, this is a problem because consultation during the process or at later stages of the building does not capture the needs and concerns of the beneficiaries well. This results in little room left for the clients and occupants to demand changes already made during the implementation of these projects. The Mail and Guardian (2016) reported that when beneficiaries are not informed or when a top-down approach is adopted, problems are likely to result later in the process. Protests that occur are a result of a passive involvement stance and this affects occupant satisfaction and design in the initial stages of the project. This shows that several issues are linked, and all these contribute to effective post-occupancy evaluations, which are community engagement, design and ownership. Failure in one of these elements can render the entire process futile.

Ownership as a critical success factor in the effective implementation of the POE is one of the key issues that emerged in this study. The results showed that most of the participants agreed or strongly agreed that ownership is one of the key areas we need to look at to implement the POE effectively. It is argued that participants or citizens in a given area are consulted, which leads to an increase in ownership. Similar to the section above, community engagement also increases ownership in development projects, as highlighted by Zonke and Matsiliza (2015). They argue that ownership is one of the key areas that emerge from effective participation in development projects to be conducted in a province. This is because the people who have been consulted can state their needs, concerns, or worries and, if these are captured, ownership of the project is enhanced. Greving, Bruckermann and Kimmerle (2020) contend that actively engaging citizens or potential beneficiaries increases ownership of the projects to follow. They further show that when a project is about to be launched, as long as it has a bearing on the public, they have to be consulted. When this is done, it ensures that they actively participate and are open to sharing their ideas that can positively assist the project. The findings in Figure 4.39 were inconclusive on this matter, although most of the respondents highlighted that they agreed or strongly agreed that ownership is a key success factor for the implementation of the POE. Further probing of the question was not possible through the questionnaire and further studies on this are required.

Proper documentation of all projects is key for effective planning and coming up with strategies for the next similar project. The findings in Figure 4.32 show that the inaccessibility of documents needed for conducting POE is a barrier to the effective implementation of POE. The results show that most of the respondents pointed out that when documents are inaccessible, the process of POE is affected. This shows that there is a need to carefully look at the barriers or things that can hinder the progress of the POE.

Similarly, Aliyu, Muhammad, Girgiri and Singhry (2016) argue that many researchers have pointed out that POE has over the years been used as a tool for documenting activities in building projects. When previous evaluations and documents are not made available, it negatively affects the entire process or slows it. Preiser (1995), cited in Chen, Bowring and Davis (2023), also points out the importance of availing documents to those conducting the POE. Previous and other documentation serves as a guide that informs those conducting the POE process. Indicators and benchmarks can also be derived from these documents thus making documents accessible, needs to be encouraged to ensure POE success. The results in Figure 4.42 on the availability of resources support this idea further. This is underscored by the majority of the respondents (80%) who strongly agreed that the availability of resources is a critical success factor that leads to the effective implementation of POE in Mpumalanga Province. Resources should not only be thought through in terms of money but also documents and other reports that may be available to assist in the POE process. Furthermore, Figure 4.45 cements this argument by indicating that the majority of the respondents (60%) emphasise that access to knowledge is a key success factor for the effective implementation of the POE. This argument posits that documentation contains this knowledge and rendering documentation inaccessible also means making knowledge of the POE inaccessible for the official task of conducting the POE.

5.5 Objective 4

The findings for objective 4 are given in this section.

In trying to establish the benefits of implementing POE practices, the study found that the majority of the participants (59%) agreed that POE practices have the benefit of increasing occupants' satisfaction. When POE practices are in place, they enable the departments working on them to understand areas they need to improve to increase the satisfaction of the

programmes or the housing they have developed. Examining Ibem's (2017) work reveals that establishing user/occupant satisfaction is key to enhancing and paying attention to a particular aspect. Having POE practices in place helps realise both tangible and intangible experiences users or occupants have in the buildings they have. Careful analysis of these can inform better decision-making and help those who design know where to focus more attention. Figure 4.68, therefore, supports the above, as respondents showed that POE practices have the benefit of increasing design know-how. Understanding the satisfaction of those who have had houses constructed and having noted areas recipients have liked and disliked before helps in designing the next project well. According to Charlton (2019), various challenges have been raised, such as poor sanitation, smaller houses and too many backyard dwellers. This has affected the level of satisfaction of those occupying the RDP houses. The author rightly points out that there is a need to have a post-occupancy evaluation of the work done by the contractors and also to see if the set objectives and targets from previous evaluations are effectively implemented. Although the Parliamentary Liaison Office (2017) notes that poverty eradication and access to housing have been stated in the RDP, the level of satisfaction with what has been constructed is key.

CSI-Network (2012), cited in Hassanain (2020), argues that POE has been avoided by many because it is seen as an expense that is beneficial to others and thus investment in it has been avoided. The findings in Chapter 4, Figure 4.52, also show that one of the key benefits of post-occupancy evaluation is that it reduces the cost of maintenance and operating costs. It was found that the majority of the respondents (71%) strongly agreed with this. A study by Hassanain, et al. (2020) shows that operating costs have been a major barrier that prevents conducting POE.

However, when records of previous POEs are kept it, enables understanding and planning of the next post-occupancy evaluation. Steveson (2009) also notes that POE implementation is usually affected by excessive costs. However, a look at Figure 4.60 also shows that regular POEs reduce operational expenses because budgets are done accordingly and adjusted well from the previous cycle. This was shown by 61% of the respondents, who indicated that the major benefit of POE is that it reduces ownership and operational costs. Hassanain, et al. (2020) posit that feedback on costs, building design and the overall POEs lead to a better understanding of costs to budget and run the evaluation process to completion.

The results in Chapter 4 show that careful evaluation of buildings and matching them with the set standards improve their value and competitive advantage. Figure 4.61 shows that the majority of the respondents (59%) strongly agreed that POE has the benefit of increasing or improving the competitive advantage in the marketplace. The responses to this question also revealed that 40% of the respondents agreed that it improves competitive advantage in the marketplace. What the results suggest is that municipalities and institutions working on POEs have to take the process seriously, as it can benefit the housing market and the beneficiaries of the housing projects in terms of the value and worthiness of the houses on the market if they are to be sold. The literature consulted could not be corroborated on this issue as data was not available to comparison. What the findings do is open up an area of discussion and more studies are required on the linkage between POE and competitive advantage in the marketplace.

One of the key themes that emerged in the analysis of the benefits of POE is the continuous improvement of processes. The improvements that were established ranged from those of the buildings themselves, design and planning, environmental impacts, satisfaction of occupants and improved fit between occupants and their buildings. The findings in Figure 4.54 acknowledged that most of the respondents (31%) agreeing and 10% strongly agreeing that POE has the benefit of proposing ways of improving the environment. Despite some mixed reactions, this observation was consistent with the responses to this question. Additionally, Figure 4.55 highlights that POE contributes to the continuous improvement of the processes. This was shown by 66% of the respondents strongly agreeing that POE improves the processes and issues to do with design in building. This is similar to what was noted earlier: conducting POE helps understand areas that need to be adjusted, redesigned, and worked on in terms of building (Kashyap et al. 2011). The findings are consistent with those of Hadjril and Crozier (2009), who argue that POE practices help gather feedback that is used to improve service delivery. This shows that municipalities need to conduct POE if they are to improve their processes and work on RDP housing. Moreover, Figure 4.74 shows that POE practices in housing projects such as the RDP are key to improving building performance. This was shown by the fact that most of the respondents strongly agreed that POE improves building performance. By examining the previous POEs, the construction companies can identify the requirements in terms of performance and also what is required of them. The POE thus becomes a guide for them, and they evaluate themselves against what has been done already.

Figure 4.73 is also consistent with the other results on the improvements realised through POE in Mpumalanga Province. The figure, as highlighted, also shows that POE also has the benefit of improving the quality and performance of the facilities. Most of the respondents (48% strongly agreed and 40% agreed) that in Mpumalanga Province, POE practices enable continuous improvement of the quality and performance of facilities. This, therefore, shows the importance of conducting POE on buildings, as it enables the teams to improve the design and facilities or buildings. This significance is underscored by existing literature.

Following the above analysis, POE is said to improve design knowledge and also provide detailed information about the buildings. Figure 4.62 shows findings on this theme. The figure shows that the majority of the respondents (61%) were of the view that by ensuring POE practices are present, detailed information about the buildings is generated. This means a detailed account of how the building was constructed is known. When this is the case, it makes it easy to rectify any problems and the available information serves as a guide for the next POE.

Handjril and Crozier (2009) argue that POE is key to giving feedback about the projects and also ensuring that the next evaluation rectifies the problems of the previous. Similarly, Boissonneault and Peters (2023) also note that POE is essential in gathering building information or how the construction was done. Our findings in the context of Mpumalanga Province thus corroborate this.

Additionally, this argument is taken further by looking at Figure 4.64. This again shows that POE is important in supporting the development of design and planning guides. This was shown by the fact that most of the respondents (49%) strongly agreed and 34% agreed that POE practices have the benefit of supporting the development of design and planning guides. Similarly, Figure 4.68 is in line with this point again. It shows that in Mpumalanga Province, POE has been assisting in increasing design know-how and thus assisting contractors who have been hired to develop of the RDP houses. This was shown by 50% of the participants, who strongly agreed that POE practices have the benefit of increasing design knowledge. Additionally, the study found that 46% of the respondents agreed, while 4% remained neutral and thus could neither confirm nor deny the statement. Aigbavboa (2012) cited in Aigbavboa and Thwala (2018) and Woon, et al. (2015) found similar results when they were looking at the overall benefits of POE in housing projects. None of the respondents to this study could deny the existence of this benefit in Mpumalanga Province housing projects.

Evaluations are said to increase awareness of the areas that need to be changed and of the requirements for those changes to take place. The findings on the benefits of POE practices in Mpumalanga Province conclude that they function and provide the basis for the necessary changes. The study found that the majority of the respondents (63%) strongly agreed that POE provides the basis for the necessary changes. This is because it highlights areas where performance has been good and also areas where adjustments need to be made. Revealing these positive and negative areas informs the contractors and municipalities on what needs to be done to reach the ideal level of performance in building RDP houses.

The above is consistent with the findings of Ratnasari and Sudradjat, 2023 as they argue that the positive and negative building performances signal the level of changes that are required. Similarly, Preiser, et al. (2015) cited in Ratnasari and Sudradjat, (2023) postulate that POE practices are essential in identifying weaknesses and thus enabling corrective measures to be administered. If the POE establishes that performance was done accordingly, measures to reinforce such practices are enabled by the contractors. In addition to the above, Figure 4.67 also shows the findings we gathered on the issue of change and the identification of new requirements in Mpumalanga Province. The study found that the majority of the respondents (63%) strongly agreed that POE practices have the benefit of functioning and providing the basis for the necessary changes in Mpumalanga Province. Thirty-one percent of the respondents also showed that they agreed with POE having this benefit. It shows that POE can be a fact-finding mission and, if done well, organisations are well prepared in advance to react to the changes that will take place, which makes it easier to rectify any problems. This is, therefore, consistent with the literature that was consulted earlier, and thus relevant authorities should be encouraged to conduct post-occupancy evaluations.

The findings in Chapter 4 also reveal that POE practices can increase occupants' satisfaction. Findings in Figure 4.72 reveal that the respondents were of the view that POE practices have the benefit of increasing occupants' satisfaction in Mpumalanga Province. The majority of the participants (959%) agreed that POE practices have the benefit of increasing occupants' satisfaction. A reading of the findings in Figure 4.71 supports this fact, as POE lowers facility life cycle costs. The majority of respondents (66%) strongly agreed that conducting POE helps lower building life cycle costs because precautionary measures will have been taken and the defect corrected in time, which has the effect of enhancing occupants' satisfaction. If the building or facility goes for a while without requiring heavy maintenance, it saves money for

the occupants and, by so doing, enhances their satisfaction with the building. Iben and Laryea (2017) note that performance evaluations conducted on buildings help increase satisfaction with the buildings occupied. Boiral (2017) observes the same issues and argues that when occupants participate in the POE, they can raise concerns, and if their demands for change are heard in the consultative meetings, the more satisfied they are with the end product, which are the houses they occupy. When this is not fostered within the POE, then occupant satisfaction is also reduced. The research findings as shown in Chapter 4, reveal the importance of POE in enhancing occupant satisfaction and also reducing the cost of building maintenance.

5.6 Conclusion

Chapter 5 discussed and analysed the findings of this study on post-occupancy evaluation. The findings revealed that POE has several benefits, which include increasing occupants' satisfaction, improving designs, providing detailed building information, and identifying new requirements. To be able to achieve these findings, critical success factors for the implementation of POE need to be present. The critical success factors that were discussed and analysed are participation, leadership, ownership, an effective flow of feedback, support from top management, and the availability of resources. The chapter also noted some of the following barriers to the effective implementation of POE in Mpumalanga Province: the inaccessibility of the documentation needed for conducting POE; and the lack of support from municipal authorities, coordination, adequate resources, and trained practitioners for POE activities. It is important to pay attention to these and ensure all information, resources, and personnel to conduct the POE are trained for the process to be a success. The next chapter provides the conclusion and recommendations of this study.

Chapter 6

Conclusion and Recommendations

6.1 Introduction

The previous chapter analysed and discussed the findings gathered for this study. The study was conducted to develop guidelines for sustainable buildings through an effective post-occupancy evaluation (POE) practice to improve POE practices in the study area. Chapter Six provides the conclusion and recommendations of the study. The conclusion and recommendations are presented in relation to the objectives of this study.

6.2 Objectives Revisited

To determine the benefits of implementing POE practices for the sustainability of buildings in Mpumalanga, South Africa.

1. To investigate the current status of POE practices in Mpumalanga, South Africa.
2. To investigate the barriers influencing the implementation of POE practices for building sustainability in Mpumalanga, South Africa.
3. To investigate the critical success factors for the effective implementation of POE in Mpumalanga, South Africa
4. To determine the benefits of implementing POE practices for the sustainability of buildings in Mpumalanga, South Africa.

6.3 Conclusion

The above section revisited the research objectives of this study. The conclusions drawn from the study are as follows:

6.3.1 Current status of POE Practices in Mpumalanga Province, South Africa.

All participants in the study confirmed their awareness of post-occupancy evaluations in Mpumalanga Province. However, there was a slight decrease in the number of respondents who were informed about the post-occupancy evaluation of RDP housing. Although this was the case, the majority of the respondents (90%) were aware of the POE being conducted on RDP

buildings. The results also further show that in Mpumalanga Province, POE is conducted regularly, but the precise time this is done could not be established. However, some noted inconclusively that it was conducted yearly or after two years. The existence of post-occupancy evaluation in Mpumalanga shows that the departments responsible are paying close attention to the quality of the buildings produced and also value feedback on the projects that they are conducting. This also further emphasises that they do not only seek to understand progress but also to inform the next projects that they will be conducting. Regular conduct of POEs is commended; however, establishing how often and the precise times are important to further enhance the POE process.

The findings of this study corroborate those of Aigbavboa and Thwala (2018), who argue that governments have shifted from only looking at the quantity to focusing on quality. This explains the regular conduct of post-occupancy evaluations in Mpumalanga Province.

6.3.2 Barriers influencing the implementation of POE practices.

One of the areas that needs to be carefully looked at is the barriers that can hinder the progress of the POE. The identification of these issues and devising preventive measures should be the subject of discussion and consultative meetings. The study revealed that there are several barriers to the effective implementation of POEs, such as a lack of understanding of POE procedures, training, feedback from previous POEs, funding, and management support, to mention just a few. The study concludes that those tasked with implementing POEs should be assessed on building standards and legislation to ensure that they know what is required. If this knowledge is lacking, training on CIBD and NHBRC guidelines and frameworks should be recommended. Individuals sent out to implement POEs should know these, and divergence from these guidelines should be reported. According to Mazibuko, et al. (2021), building contractors have significantly contributed to the violation of the set standards, which means POEs should be taken seriously. The material used and labour should be of excellent quality, as required by the NHBRC. Preiser (1995), cited in Chen, Bowring and Davis (2023), also points out the importance of availing documents to those conducting the POEs. Previous and other documentation serves as a guide that informs those conducting the POE processes. Indicators and benchmarks can also be derived from these documents; making them inaccessible needs to be encouraged to ensure POE success.

6.3.3 Critical success factors for the effective implementation of POE in Mpumalanga

From the findings in Chapter 4, it can be concluded that to ensure the effective implementation of post-occupancy evaluation in RDP buildings, their participation and commitment should be encouraged, and occupants should be made part of these. It is also important to ensure that the programme is supported by top management and that resources are made available. Ensuring participation and feedback, as noted in the discussion above, creates a sense of ownership of the project and enables ideas and concerns to be expressed freely. The findings as shown in chapters 4 and 5, on the critical success factors revealed support by the majority of the respondents agreeing with them. The results on these are also similar to previous studies, and they also address a few key issues. In conducting POE, municipal authorities have to ensure that these success factors are discussed in the meetings and find ways to enhance them. Once there is a success factor that is lacking, discussions and ways to enhance it through training should be encouraged to ensure sustainable buildings.

6.3.4 Benefits of implementing POE Practices for the sustainability of buildings

The study also found several benefits to conducting POE in RDP buildings. The findings show that POE can provide the basis for necessary changes, help increase design knowledge, building performance, and occupants' satisfaction, and reduce maintenance costs. The findings are consistent with those of Hadjril and Crozier (2009), who argue that POE practices help gather feedback that is used to improve service delivery. This shows that municipalities need to conduct POEs if they are to improve their processes and work on RDP housing. Similarly, Boissonneault and Peters (2023) also note that POE is essential in gathering building information or how the construction was done. Ratnasari and Sudradjat, (2023) postulate that POE practices are essential in identifying weaknesses and thus enabling corrective measures to be administered. If the POE establishes that performance was done accordingly, measures to reinforce such practices will be enabled by the contractors. This shows that POEs should be taken seriously and that enough resources are available to realise these benefits.

6.4 Recommendations

1. The study recommends that government officials need to ensure active participation and discussion with occupants of RDP buildings. This will enable them to gather the needs and issues occupants have with the buildings.

2. The study also recommends that critical training of officials sent to evaluate the RDP buildings be done. This has to be in the housing legislation, guidelines, and frameworks to ensure quality buildings are developed. Strong enforcement of these regulations and policing of them should be done as well.
3. All stakeholders and government officials must also be conscientised of the need for post-occupancy evaluation. Creating awareness of POE and ensuring that it is given due respect should be fostered in municipalities.
4. The study also recommends creating an environment that encourages effective POE implementation. Paying attention to the environment and reporting challenges will assist in improving the POEs. Waiting to report the challenges at the end should be avoided, so constant feedback should be encouraged when conducting POEs.

6.5 Areas of Further Study

The study provided insights into the barriers and critical success factors that those tasked with conducting POEs have to pay attention to. This was drawn from public officials and more needs to be done to understand this from the occupants themselves. Understanding these matters from the perspectives of the RDP housing occupants can unveil overlooked issues, providing insights into their perceptions and concerns about the buildings they occupy. More studies on POE can be done in other provinces and comparative studies can be done to understand how others are doing and producing POE best practices in South Africa. Lastly, more studies have to be undertaken on the process of POE, detailing how it is conducted to enhance the quality of these evaluations.

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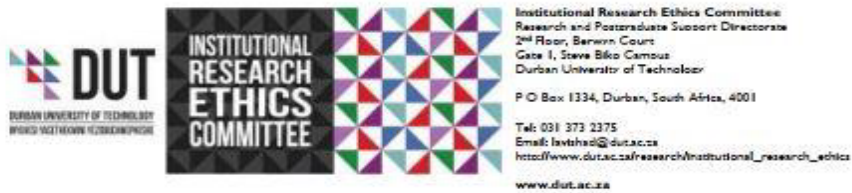
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Appendices

Appendix A



29 November 2022

Mr N J J Simelane
P.O BOX 3020
White River
1240

Dear Mr Simelane

Sustainable Construction through the Implementation of Post Occupancy Evaluation (POE) Practices: A Case Study of Reconstruction and Development Programme (RDP) buildings in Mpumalanga
Ethics Clearance Number: IREC 002/22

The Institutional Research Ethics Committee acknowledges receipt of your notification regarding the piloting of your data collection tool.

Kindly ensure that participants used for the pilot study are not part of the main study.

In addition, the IREC acknowledges receipt of your gatekeeper permission letter.

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 IREC according to the IREC SOP's.

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

Yours Sincerely,

Professor J K Adam
Chairperson: IREC

Appendix B



CONSENT

Full Title of the Study: Sustainable Construction through the Implementation of Post Occupancy Evaluation (POE) Practices: A Case Study of Reconstruction and Development Programme (RDP) buildings in Mpumalanga in full)

Names of Researcher/s: Nkuthalo John-Junior Simelane

Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher, _____ (name of researcher), 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 computerized 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.

Full Name of Participant **Date** **Time** **Signature** / **Right**
Thumbprint

I, _____ (name of researcher) herewith confirm that the above participant has been fully informed about the nature, conduct and risks of the above study.

Full Name of Researcher **Date** **Signature**

Full Name of Witness (If applicable) **Date** **Signature**

29 APRIL 2022

Appendix C



Department of Construction Management
and Quantity Surveying
Faculty of Engineering and the Built Environment
Durban University of Technology
S3 Level 2, Room 853 404 Steve Biko Campus,
Durban, 4001

P O Box 1334, Durban, South Africa, 4000

Tel: (031) 373 2143
Fax: (031) 373 2610

www.dut.ac.za

To: Mr Uno Okon
Chief Director: Programme and Project Management
Department of Human Settlement
3rd Floor, Rhino Building
Riverside Government Complex
Nelspruit

Dear Sir

LETTER OF REQUEST TO CONDUCT RESEARCH

I am Mr Nkuthalo John Junior Simelane (student number 21437673) a Master student in the Department of Construction Management and Quantity Surveying, Durban University of Technology, Durban, South Africa. I am currently conducting a research titled '*Sustainable Construction through the Implementation of Post Occupancy Evaluation (POE) Practices: A Case Study of Reconstruction and Development Programme (RDP) buildings in Mpumalanga*' under Dr M Mewomo's principal supervision as well as Dr C. Okorafor's co-supervision. The research requires that I should conduct a questionnaire survey with professionals within the Department of Human Settlements Mpumalanga that are involved in the construction and quality assurance of Reconstruction and Development Programme (RDP) housing in Mpumalanga, South Africa.

I have therefore identified the Department of Human Settlements Mpumalanga as a potential source of information for my study. The Department is selected because of their involvement in the construction of RDP's in the Province of Mpumalanga. I would like to kindly request your permission to provide me with a gatekeeper's approval letter for ethical purposes.

The letter should indicate that I, Mr. Nkuthalo John Junior Simelane is a registered student, currently studying for his Master degree in Construction Management and Quantity Surveying, and has been granted permission by the Department of Human Settlements Mpumalanga to conduct research among the professionals involved in the construction and quality assurance of RDP's. Participants are anonymous. There are no known risks, current or anticipated, to any participant in this research and all information received will be treated with utmost confidentiality.

With regards to any queries, please do not hesitate to contact nkuthalosingelane@gmail.com, AvodejiA@dut.ac.za and ModupeM@dut.ac.za

Thank you in anticipation of your favorable consideration of this request

Mr Nkuthalo John Junior Simelane
Department of Construction Management & Quantity Surveying
Durban University of Technology, Durban, South Africa
Cell: 071 353 1888

Chief Director: Programme and Project Management
Department of Human Settlement

Appendix D

Pilot testing letter Request

Dear Sir,

Good day. I trust this email finds you well.

Kindly permit me to introduce myself. I am Mr Nkuthalo John Junior Simelane, a Master Student at the Durban University of Technology. I am currently conducting research on "***Sustainable Construction through the Implementation of Post Occupancy Evaluation (POE) Practices: A Case Study of Reconstruction and Development Programme (RDP) buildings in Mpumalanga***". The aim of the study is to investigate sustainable construction through the implementation of post occupancy evaluation (POE) practices in the Ehlanzeni District Municipality in Mpumalanga Province. The study intends to develop a framework for sustainable construction through an effective POE practice with a view to improve the practice of POE in the study area.

My research study has just received a provisional ethical clearance from my University and I am required to conduct a pilot test on the research instrument (questionnaire) to determine its ability to collect the required information in order to achieve the objectives of the research.

As one of the employees in the Department of Human Settlements Mpumalanga, working in programme and project management, you are recognised as one of the knowledgeable individuals in this specific topic with experience of the Reconstruction and Development Programme (RDP).

I request your kind assistance to take a few minutes of your time and go through the attached survey questionnaire that I wish to use as a tool to gather information for the research study. Kindly advise on the questionnaire's rationality, appropriateness, and ability to do the job which it is designed to perform.

Your comments on the following will be highly appreciated:

- The covering letter
- Rationality and appropriateness of the questions
- Overall appearance of the questionnaire (Please click on the link to view the appearance)
- Time taken to complete
- The layout of the questions
- Any additional comments

Your assistance will be highly appreciated.

Kind regards,
Nkuthalo John Junior Simelane.

Appendix E



LETTER OF INFORMATION

Title of the Research Study: Sustainable Construction through the Implementation of Post Occupancy Evaluation (POE) Practices: A Case Study of Reconstruction and Development Programme (RDP) buildings in Mpumalanga in full)

Principal Investigator/s/researcher: Nkuthalo John-Junior Simelane

Co-Investigator/s/supervisor/s: Dr M Mewomo, PHD
Dr C. Okorafor, PHD

Brief Introduction and Purpose of the Study:

Good Day, I hope you are well.

I am a student at Durban University of Technology doing Master in Built Environment.

Research is the systematic search or enquiry for generalized new knowledge. Throughout the research, you are encouraged to ask as many questions as you may have. This is important as your full understanding of the study will be beneficial to the research. You are not prohibited from discussing the study with friends and family and you are not obligated to commit at this stage. Thus a copy of the Letter of Information document is provided to you to take home.

The aim of this research is to develop a framework for sustainable construction through an effective Post Occupancy Evaluation practice with a view to improve Post Occupancy Evaluation practices in the study area. To achieve this aim, the objectives are set to:

- i. Investigate the current state of Post Occupancy Evaluation practice in Mpumalanga
- ii. Investigate the barriers influencing the implementation of Post Occupancy Evaluation practices.
- iii. Investigate the critical success factors for effective implementation of Post Occupancy Evaluation

Determine the benefits of Post Occupancy Evaluation practices. The completed questionnaires will be collected by 30/07/2021. The information gathered will be treated in strict confidence and a summary of the results will be available on request. The questionnaire is anonymous as you are not required to fill in your name. Additionally, I assure you that any information you will provide shall be used for academic purposes only. Your participation in this project is voluntary. You may refuse to participate or withdraw from the project at any time with no negative consequence. It should take you about 20 minutes to complete the questionnaire. 80 participants will be involved in the study.

Your participation is anonymous. There are no known risks, current or anticipated, to your participation in this research and all information received will be treated with utmost confidentiality.

