

**Integrating sustainability dimensions into construction labour
productivity determinants in Zimbabwe**

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DECLARATION

In accordance with Rule G5.6.3, I hereby declare that the above-mentioned treatise/ dissertation/ thesis is my work and that it has not previously been submitted for assessment to another University or for another qualification.

6 December 2019



Tirivavi Moyo

DEDICATION

I dedicate this work to my wife Cynthia and daughter Kunashe, my mother Kumbirai and my siblings and their families.

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I acknowledge the Almighty Jehovah for the strength to undertake this difficult but rewarding task. He deserves all the glory and honour.

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ABSTRACT

Low construction labour productivity and inadequate welfare of construction workers is a compound challenge in Zimbabwe. This challenge is due to shortcomings situated in the Decent Work Agenda. Whilst a plethora of contributory factors exists, those that affect the Zimbabwean construction industry were identified for interrogation. Therefore, the study aimed to improve and sustain construction labour productivity in Zimbabwe through fulfilling significant decent work substantive elements, in consideration of demographic variables of stakeholders. A cross-sectional survey research strategy was utilised with quantitative data being collected from selected respondents through the use of questionnaires. The population for the study consisted of randomly selected construction companies registered with the Construction Industry Federation of Zimbabwe and based in Harare, Bulawayo and Shurugwi where site managers'/project managers' participated. Construction skilled and semi-skilled workers on thirteen (13) construction sites, situated within the same study area, participated in the study. Educators from technical and vocational training institutions and respondents from relevant regulatory bodies were also selected to participate in the study. Quantitative data analysis methods which included Pearson chi-squared tests, Mann-Whitney U tests; Kruskal-Wallis tests, Pearson bivariate correlation method and Regression analysis were utilised.

Demographic variables (age, gender, designation, educational levels and experience) were utilised to determine the existence of statistically significant differences in respondents' perceptions. Construction companies are encouraged to implement corporate social responsibility strategies through equipping workers of different educational levels with knowledge and skills that can be transferred to and benefit themselves and their communities. Adequately trained construction workers best serve their communities through improving their livelihoods, improved safety and health consciousness and quality workmanship. People-centred management aspects were found to be fundamental within construction sites as they promote the welfare of workers and should precede any productivity improvement drives. Technical and vocational training institutions need to inculcate sustainability learning objectives within their curricula if any meaning strides in enhancing welfare and productivity of workers is to be achieved. Also, establishing structured on-the-job training that incorporates sustainability learning objectives to achieve workers' safety on sites is essential. There was a consensus that working conditions must ensure the welfare of workers first before any productivity gains can be realised. Provision of acceptable decent working conditions for different designations and educational levels was encouraged. A comprehensive model was developed for sustaining

construction labour productivity that included statistically significant regression models and derived statistically significant demographics from construction labour productivity determinants under study. Validation of the regression models was undertaken through cross-validation and comparison with existing theory. Tenable labour productivity performance measurement and reporting must be inclusive of decent work accomplishments. Short-term interventions that include awareness campaigns and provision of adequate working conditions are required for project-based resolutions whilst, long-term interventions are required where structural reforms within the training of skilled, semi-skilled workers and managers are required, for continuous improvement.

Keywords: Construction, Decent work, Labour, Productivity, Sustainability, Zimbabwe

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LIST OF ABBREVIATIONS

CIFOZ	Construction Industry Federation of Zimbabwe
CIOB	Chartered Institute of Building
CSSSW	Construction Skilled and Semi-Skilled Workers
DEAP	District Environmental Action Planning
DJSI	Dow Jones Sustainability index
ESE	Employment by Status in Employment
GDP	Gross Domestic Product
GRI	Global Reporting Initiative
ILO	International Labour Organisation
NSSA	National Social Security Association
NEC	National Employment Council
OECD	Organisation for Economic Cooperation and Development
SPM	Site and Project Managers
TBL	Triple Bottom Line
UN	United Nations
UNEP	United Nations Environmental Programme
UNESCO	United Nations Education Science and Cultural Organisation
UNICEF	United Nations
WCED	World Commission on Environment and Development
WX	Worker Exempted
ZBCA	Zimbabwe Building Contractors Association
ZIMASSET	Zimbabwe Agenda for Sustainable Socio-Economic Transformation
ZUNDAF	Zimbabwe United Nations Development Assistance Framework

THE DEFINITION OF KEY TERMS

Determinants

Factors contributing to an intended outcome (Decker, Thompson & Wohar, 2009: 2).

Labour productivity

Labour productivity is particularly important in the economic and statistical analysis of a country as it measures the ratio of output versus a measure of the input use of labour (Organisation for Economic Cooperation and Development, 2008:5).

Productivity

Productivity was formally defined as the ratio of a volume measure of output to a volume measure input use (Organisation for Economic Cooperation and Development, 2001:11).

Sustainability

Sustainability is meeting society's present needs without compromising the ability of future generations to meet their own (World Commission on Environment and Development, 1987: 43).

Sustainable Construction

Sustainable construction is how the construction industry can contribute to the sustainability of the earth including its human inhabitants (Halliday, 2008: 1).

Sustainability dimensions

Sustainability dimensions are the interdependencies between the economy, the environment and the society through economic, environmental and social scopes (Cutter, 2015: 4).

CHAPTER 1: THE SETTING OF THE STUDY

1.1 INTRODUCTION

In Zimbabwe, delivery of both private and public-sector construction projects has been erratic, and insufficient labour productivity has been one of the major contributors to this anomaly (Moyo, Mangore & Chigara, 2014: 42). The performance of the construction industry is dependent on the performance of construction labour productivity since labour plays a significant role in project success (Nasirzadeh & Nojedehe, 2013: 903). The construction industry is overwhelmed with challenges of which most are associated with the performance of labour (Soekiman, Pribadi, Soemardi & Wirahadikusumah, 2011: 865). Despite the efficiency of labour productivity being pertinent to a sustainable economic future (Mahlberg, Freund, Cuaresma & Prskawetz, 2013: 5), construction industry labour productivity has continued to decline worldwide (Chartered Institute of Building (CIOB), 2016: 5). Zimbabwe has suffered from suppressed economic growth emanating from low productivity (Zimbabwe National Employment Policy Framework, 2009: 17). Contrary to developed countries, which have invested much in technology advancement and increased levels of mechanisation, countries like Zimbabwe can only address improvements considering the need to reduce high levels of unemployment and poverty and this compounds the challenge (Zimbabwe National Employment Policy Framework, 2009: 7).

The study of labour productivity models has been continuous since the 1940s and improvements are still being sought (Jang, Kim, Kim & Kim, 2011: 94). There are huge opportunities for improvements on the efficiency of the construction industry (Fazli, Enferdi, Fazli & Fathi, 2014: 1116), though the realisation of gains emanating from these opportunities continue to elude most construction industries. A considerable number of researchers have extended different productivity models (Thomas & Sakarcan, 1994; Fayek & Oduba, 2005; Graham & Smith, 2004; Zayed & Halpin, 2005; Jang *et al.*, 2011; Mawdesley & Al-Jibouri, 2009; Muqueem, Idrus, Khamidi & Zakaria, 2011; Nasirzadeh & Nojedehe, 2013) and the common characteristic of these has been the focus on the determinants of productivity. However, globalisation has necessitated the demand for economic, social and environmentally sustainable approaches for productivity improvement (Burgess & Heap, 2012: 336). In the same context, the International Labour Organisation (ILO) (2006:1) relays the importance of achieving the decent work paradigm objectives of advancing rights to work, social security, remunerative employment and social dialogue.

The sustainability concern and the decent work objectives are thus congruent as they both seek to preserve the future of resources, in this context the human resource. The models have therefore lacked in meeting the decent work objectives through a sustainability-oriented holistic approach, which specifically considers the impact of industrial, educational and labour policies, amongst others. Hence, the paramount determinants of productivity entail rigorous planning and intensive regulation before and during the inception of any model. This apparent gap motivates the achievement of efficiency within the construction industry. This can be realised by providing a platform on which to improve construction labour productivity by integrating sustainability dimensions within its determinants.

1.1.1 Sustainability dimensions' perspective

The importance of the construction industry in the sustainability matrix led to the international community promulgating the Agenda on Sustainable Construction (Du Plessis, 2002: 1). Further to that, the vast differences between the specifics for developed and developing countries then contributed to the promulgation of the special Agenda 21 for Sustainable Construction in Developing Countries. Though the World Commission on Environment and Development report argued that boosting the economies, protecting natural resources, and ensuring social justice were complementary goals, the concept is vulnerable to distortion (Victor, 2006: 91). There is a necessity to drop the environmental bias that has commandeered the entire sustainable development effort (Victor, 2006: 95) since sustainable development should not exclusively focus on environmental concerns (Mohammad, 2011: 92). Adebayo (2001: 10) proclaims that the construction sector in Africa must begin to address sustainable development beyond suitable construction materials and waste management methods. Further emphasis is on the need to undertake sufficient research to address the consequences of the built environment on such development. Kibert (2002: 383) adds to the challenge by remarking that sustainable construction considers construction resources to only be materials, land, energy and water. Equally, Sfakianaki (2015: 235) recognises the significance of resource efficiency in sustainable construction but fails to specifically acknowledge human resources within the consideration. This is contradictory to the Rio Declaration principle that states that "Human beings are at the centre of concern for sustainable development and are entitled to a healthy and productive life in harmony with nature" (Mohammad, 2011: 91).

While the absence of human resources inclusion is notable, strides have been taken, though insufficient, to rectify this anomaly. Lill (2008: 864) relays that “sustainable development of the construction industry has to concentrate not only on sustainable building technologies and construction materials but also on respectful and considerate labour management strategies”. There is a further intimation that the workforce must be treated as the most valuable un-reproducible resource with susceptible and hardly foreseeable demeanour. Similarly, Presley and Meade (2010: 440) refer to the respect of employees as being important to ensure sustainable construction. Suliman and Abdelnaser (2009: 81) also contribute by reporting that improvement of working environment quality, safety and health as well as opportunities for employee development and employment equity has become critical.

The human resources context is considered with due regard to economic, environmental and social dimensions thus broadening the ultimate sustainability developmental goal. Though sustainable construction seeks to deliver built assets through profitable and competitive processes (Suliman & Abdelnaser, 2009: 78), the aspects of sustainability with regards to human resources must not be undermined. They further intimate that maximisation of use of resources and enhancement of quality of life is key in this endeavour. This culminates in the assessment of sustainable needs for construction workers being: the economic perspective (how they produce goods and services); the environment perspective (how they can contribute to the conservation of natural resources); and the social perspective (how their quality of life can be enhanced) (Government of Zimbabwe, 2012: 12). Again, all these requirements are synonymous with the fundamentals of the decent work agenda which is spearheaded by the International Labour Organisation (ILO, 2009: 2,3) and thus human resources inclusion in the sustainable construction agenda equally translates to achieving decent work.

1.1.2 Construction labour productivity determinants for the integration of sustainability dimensions

The construction industry is requiring the delivery of improved working conditions with changes in productivity (CIOB, 2016: 13). While the Zimbabwean construction industry faces a magnitude of challenges, solutions should, therefore, be consequently borne within the increasing concept of sustainability (Presley & Meade, 2010: 435). This is due to

sustainability having mutated into a strategic authority for the future of construction (Galpin, Whittington & Bell, 2015: 1). Hence greater focus on maximising on construction labour productivity performance and simultaneously addressing labour sustainability concerns is envisaged. Fragmented sustainability development strategies have and continue to be implemented with no consequent construction labour productivity improvements. This is evidenced by the need for perpetuating equality in terms and conditions of employment and the requirement for a stable workload, satisfactory and safe working conditions (Lill, 2008: 865).

The evaluation of the magnitude of the effect of different determinants on productivity is pertinent in improving labour productivity. Constant changes of these determinants and their impact and the resultant implications need a continuous approach in labour productivity modelling and re-modelling. Hence, despite the generation of several productivity models and application by practitioners (Bures & Stropkova, 2014: 1088), the solution must incorporate sustainability concerns within specific determinants of construction labour productivity.

Zimbabwe seeks to address issues of governance and management structures, curriculum development and assessment, institutional skills development, and marginalisation and labour market (Zimbabwe National Employment Policy Framework, 2009: 21). In pursuance of this, Piercy and Rich (2015: 282) further support that sustainability should not be limited to environmental concerns but driven by other dimensions of the workforce, supply chain, community, governance and quality issues. Chigara and Moyo (2014a: 62) further defines the aspects of this study by alluding to significant broad determinants affecting construction labour productivity in Zimbabwe as those related to corporate social responsibility, management, training, motivational and technical issues. These are significant determinants which need comprehensive redress to achieve sustainability within the Zimbabwean context.

As consideration of all the singular determinants that affect productivity is structurally impossible, addressing these key broad determinants of construction labour productivity by the integration of sustainability dimensions is vital. Sustainability issues impact construction companies and demand that they work towards a universal and non-discriminatory approach to human welfare (Ahern, 2015: 497). Construction projects should attempt to balance financial, environmental and operational aspects of every organisational decision

(Suliman & Abdelnaser, 2009: 83) whilst the on-site productivity management context has been inadequate in addressing the productivity challenge (Chan & Kaka, 2007: 564). Lack of workforce skills is one of the top five factors that were affecting labour productivity in the Zimbabwean construction industry (Chigara & Moyo, 2014: 57) and its changing demands should include incorporation of sufficient knowledge and skills for sustaining labour productivity development (Murray & Cotgrave, 2007: 13). Inclusion of decent work conditions aspects in productivity measurement is essential due to differences in varying environments and characteristics (Park, 2006: 315). ILO (2018d: 3) concurs by highlighting the key issues that should be addressed by governments, employers and employees as the changing organisation of production and work and the accompanying changes in employment relationships; the need for skills development; the impact of globalisation and new technologies on working conditions and occupational safety and health; and how companies can contribute to sustainable development. Thus, the following broad determinants can be deduced, relate to the construction industry, from the country-specific goals as:

- corporate social responsibility strategies;
- people-centred labour productivity management aspects;
- sustainability literacy through technical and vocational training for skilled construction workers;
- sustainability literacy through on-the-job training schemes for semi-skilled construction workers, and
- provision of decent working conditions.

Corporate sustainability entails the transfer of the sustainable development vision from the society to the business level (Will, 2008: 234) with the result of creating opportunities (Spitzeck, Sergio & Leao, 2013: 613). Piercy and Rich (2015: 288) state that maintaining a positive reputation is important in strategy setting for an organisation through improving working conditions and lessening production defects. Exploration for successful sustainable delivery of construction projects through effective project management principles and processes is continuous (Agyekum-Mensah, Knight & Coffey, 2012: 426) and this entails establishing sound productivity regulatory institutions.

Integration of sustainability dimensions is imperative and benefits are bound to reverberate across the construction industry and beyond and more-so on effective and efficient labour management. Creating sustainable workplaces through sustainable on-site labour

productivity management is crucial as it promotes respect and fair treatment of workers, enhancing and better protection of the natural environment and increasing profitability and competitiveness (Smith & Pitt, 2011: 146). Training and skills development is crucial in promoting attitudinal change (Cotgrave & Kokkarinen, 2010: 269) in environmental awareness, social progression and economic development.

Failure to address these concerns will inadvertently further stall labour growth in tandem with globalisation needs. The Zimbabwe National Employment Policy Framework (2010: 25, 26) policy that “creates an enabling and conducive environment for sustainable employment creation; produce an appropriately skilled and employable labour force”, would be difficult to achieve. Profitability and growth of companies would be compromised because of high labour costs associated with; accidents due to unsafe work environments and inadequate skill; importation of labour due to failure of uplifting local communities; lack innovations that reduce costs; unmotivated workers; low worker retention; rework; increase in labour wastage and failure to maximise on material usage leading to material wastage.

Labour productivity performance measurement must aim to condense economic, environmental and social dimensions through encompassing its comprehensiveness, applicability, transparency and practicability (Akadiri & Olomolaiye, 2012: 672,673). Smith and Pitt (2011: 146) relay that there is a need for performance measures that are people-oriented and encourage management of perceptions leading to productivity gains. Thus, indicators for the sustaining labour productivity must be established, monitored and controlled according to their varying significance within the Zimbabwean construction industry.

This study, therefore, focuses on integrating sustainability dimensions, which are situated within the decent work agenda, into construction labour productivity established determinants, which suits the Zimbabwean construction industry. Development of a model that will be used to initiate, monitor and control the performance of construction labour productivity is envisaged.

1.2 THE PROBLEM STATEMENT

Low construction labour productivity is prevalent and the immediate national drive towards achieving sustainability presents a need for a new perspective within its context. The prerogative is “to promote and secure sustainable, full, productive and freely chosen decent

employment for all the conditions of freedom, equity, security and human dignity” (Government of Zimbabwe, 2014: 25). There has been an accumulation of costs associated with poor productivity, which has resulted in production costs skyrocketing (Zimbabwe National Chamber of Commerce, 2015: online). Such cost overruns within the Zimbabwean building industry have been attributed to shortages of appropriately skilled personnel and organisational related challenges amongst other factors (Forbes & Ahmed, 2011: 28; Chigara, Moyo & Mudzengerere, 2013: 42; Chigara & Moyo, 2014a: 57;). This has been aggravated by lack of workforce skills and lack of labour experience, which are amongst the top factors affecting labour productivity within the Zimbabwean construction industry (Chigara & Moyo, 2014a: 57; Mhlanga, 2018: 12). The whole situation is compounded by the absence of an enabling policy framework and active labour market policies that deal with decent work deficits that include vulnerable employment, low productivity, declining capacities of skills development and mismatch of skills (ZUNDAF, 2010:19).

Achieving decent work is fundamental. This endeavour warrants examination of how sustainable development dimensions’ incorporation can augment the shortcomings. However, there are various debates as to how to translate this into practice and develop indicators to assess whether it is being achieved (Mohammad, 2011:91). Burgess and Heap (2012: 336) expound that there has been no consensus on how social, economic and environmental productivity can be holistically measured and assessed as this has been widely recognised as pertinent for long term sustainability. Developing countries are having difficulties in their social systems such as inequity, health problems and poverty (Almahmoud & Doloi, 2015:153) rendering this momentous task almost unachievable. Kocer (2014:356) substantiates by reporting that any measures and concerns should be country-specific. Cumulatively, productivity improvement that incorporates sustainability dimensions, that are situated in the decent work agenda, is non-existent in Zimbabwe.

The problem statement states that “Low construction labour productivity and failure to provide decent work for construction workers has led to project time and cost overruns, gender inequalities, vulnerable employment, declining skills development, health problems, accidents and discrimination on construction sites”.

In pursuit of the provision of a holistic solution to construction labour productivity concerns, sustainability dimensions and concepts must be incorporated together with more traditional measures within their analysis (Presley & Meade, 2010: 435). Major strides in this

endeavour can include achievement of construction innovation through corporate sustainability (Spitzeck, Sergio & Leao, 2013: 614); comprehension of social, economic and environmental friendly embedded labour productivity (Kocer, 2014: 354); realisation of how sustainability can be incorporated into skills development or entrepreneurship curricula (Wyness, Jones & Klapper, 2015: 834) and development of evaluation criteria for sustainability in construction labour productivity (Akadiri & Olomolaiye, 2012: 666). Therefore, interrogation of Decent work substantive elements and indicators, which are measurable on projects, will have constructive implications for the well-being of construction workers, the profitability of contractors, and labour productivity in the industry.

1.3 MAIN RESEARCH QUESTION

How can improved construction labour productivity in Zimbabwe be achieved and sustained through fulfilling the decent work agenda?

1.3.1 Research sub-questions

i. Corporate social responsibility strategies

RSQ 1.1 What significant corporate social responsibility strategies lead to an improved construction of skilled and semi-skilled workers' social security in Zimbabwe the most?

RSQ 1.2 What is the difference of perceptions, due to demographic variables, of construction site managers'/ project managers' and construction skilled trade workers on corporate social responsibility strategies that lead the most to improved construction skilled and semi-skilled workers' social security?

ii. People-centred management aspects

RSQ 2.1 What are the significant people-centred management aspects that influence adequate employment treatment for Zimbabwean construction skilled and semi-skilled workers the most?

RSQ 2.2 What is the difference of perceptions, due to demographic variables, of construction site managers'/ project managers' and construction skilled trade workers on people-centred management aspects that influence adequate employment treatment for construction skilled and semi-skilled workers the most?

iii. Sustainability literacy objectives through technical and vocational training for construction skilled workers

RSQ 3.1 What significant sustainability literacy aspects contribute the most to adequate productive work for technical and vocational trained Zimbabwean construction skilled workers?

RSQ 3.2 What is the difference of perceptions, due to demographic variables, of construction site managers'/ project managers, vocational lecturers and construction skilled trade workers on sustainability literacy aspects that contribute the most to adequate productive work for construction skilled workers?

iv. Sustainability literacy objectives through on-the-job training schemes for construction semi-skilled workers

RSQ 4.1 What significant sustainability literacy objectives contribute the most to a safe working environment for on-the-job trained Zimbabwean construction semi-skilled workers?

RSQ 4.2 What is the difference of perceptions, due to demographic variables, of construction site managers'/ project managers, training managers, construction semi-skilled workers and training managers on sustainability literacy objectives that contribute the most to a safe working environment for construction skilled workers?

v. Provision of decent working conditions

RSQ 5.1 What are the significant decent working conditions that influence improved productive work for Zimbabwean construction skilled and semi-skilled workers the most?

RSQ 5.2 What is the difference of perceptions, due to demographic variables, of construction site managers'/ project managers' construction skilled trade workers on decent working conditions that lead the most to improved productive work for construction skilled and semi-skilled workers?

vi. Indicators for sustaining construction labour productivity performance

RSQ 6 How can the indicators be utilised for sustaining construction labour productivity performance in Zimbabwe?

1.4 THE HYPOTHESES

i. Corporate social responsibility strategies

H 1.1 The implementation of policies to ensure the well-being of all employees leads to improved construction skilled and semi-skilled workers' social security in Zimbabwe the most

H 1.2 Age, gender, designation, educational levels and experience of construction site managers'/ project managers and construction skilled trade workers do not lead to significant differences of perceptions on corporate social responsibility strategies that lead the most to improved construction skilled and semi-skilled workers' social security

ii. People-centred labour aspects

H 2.1 A functioning reward culture is the most significant people-centred management aspects that leads to adequate employment treatment for Zimbabwean construction skilled and semi-skilled workers

H 2.2 Age, gender, designation, educational levels and experience of construction site managers'/ project managers and construction skilled trade workers do not lead to significant differences of perceptions on people-centred management aspect that influence adequate employment treatment for construction skilled and semi-skilled workers the most

iii. Sustainability literacy objectives through technical and vocational training for construction skilled workers

H 3.1 Positive physical and mental health well-being learning objectives contribute the most to adequate productive work for technical and vocational trained Zimbabwean construction skilled workers

H 3.2 Age, gender, designation, educational levels and experience of construction site managers'/ project managers, vocational lecturers and construction skilled trade workers do not lead to significant differences of perceptions on perceptions of sustainability literacy objectives that contribute the most to adequate productive work for construction skilled workers

iv. Sustainability literacy objectives through on-the-job training schemes for construction semi-skilled workers

H 4.1 Training in socio-economic dimensions of well-being contribute the most to a safe working environment for on-the-job trained Zimbabwean construction semi-skilled workers

H 4.2 Age, gender, designation, educational levels and experience of construction site managers'/ project managers, training managers, construction skilled trade workers do not lead to significant differences of perceptions on sustainability literacy objectives that contribute the most to a safe working environment for on-the-job trained construction semi-skilled workers

v. Provision of decent working conditions

H 5.1 Adequate occupational safety and health conditions influence improved productive work of Zimbabwean construction skilled and semi-skilled workers the most

H 5.2 Age, gender, designation, educational levels and experience of construction site managers'/ project managers' construction skilled trade workers do not lead to significant differences of perceptions on decent working conditions that lead the most to improved productive work for construction skilled and semi-skilled workers

vi. Indicators for sustaining construction labour productivity performance

H 6 Comprehensive indicators for sustaining construction labour productivity performance can be developed through consultations with, and demographic considerations of, construction stakeholders.

1.5 AIM

To improve and sustain construction labour productivity in Zimbabwe through fulfilling significant decent work substantive elements in consideration of demographic variables of stakeholders.

1.6 OBJECTIVES

The aim of this study will be achieved through an in-depth analysis of the specific objectives as outlined below:

i. Corporate social responsibility strategies

OBJ 1.1 To determine significant corporate social responsibility strategies that contribute to improved construction skilled and semi-skilled workers' social security in Zimbabwe the most.

OBJ 1.2 To establish the difference of perceptions, due to demographic variables, of construction site managers'/ project managers and construction skilled trade workers on corporate social responsibility strategies that lead the most to improved construction skilled and semi-skilled workers' social security.

ii. People-centred management aspects

OBJ 2.1 To determine significant people-centred labour aspects that influence adequate employment treatment for Zimbabwean construction skilled and semi-skilled workers the most.

OBJ 2.2 To establish the difference of perceptions, due to demographic variables, of construction site managers'/ project managers and construction skilled trade workers on people-centred management aspects that influence adequate employment treatment for construction skilled and semi-skilled workers the most.

Sustainability literacy objectives through technical and vocational training for construction skilled workers

OBJ 3.1 To determine significant sustainability literacy objectives that contribute the most to adequate productive work for technical and vocational trained Zimbabwean construction skilled workers

OBJ 3.2 To establish the difference of perceptions, due to demographic variables, of construction site managers'/ project managers, vocational lecturers and construction skilled trade workers on sustainability literacy objectives that contribute the most to adequate productive work for construction skilled workers

Sustainability literacy objectives through on-the-job training schemes for construction semi-skilled workers

OBJ 4.1 To determine significant sustainability literacy objectives that contribute the most to a safe working environment for on-the-job trained Zimbabwean construction semi-skilled workers

OBJ 4.2 To establish the difference of perceptions, due to demographic variables, of construction site managers'/ project managers, training managers, construction skilled trade workers and training managers on sustainability literacy objective that contributes the most to a safe working environment for construction semi-skilled workers

v. Decent working conditions for improved construction labour productivity

OBJ 5.1 To determine significant decent working conditions that influence improved productive work for Zimbabwean construction skilled and semi-skilled workers the most

OBJ 5.2 To establish the difference of perceptions, due to demographic variables, of construction site managers'/ project managers' construction skilled and semi-skilled workers on decent working conditions that lead the most to improved productive work for construction skilled workers

Indicators for sustaining construction labour productivity performance

OBJ 6 To develop a model on sustaining construction labour productivity performance through consultations with, and demographic considerations of, construction stakeholders, the Zimbabwean construction industry aligns to

1.7 DELIMITATIONS OF THE STUDY

The study will be delimited in terms of the theoretical framework, geographical coverage, participants and data analysis as follows:

- The model for measuring the performance of sustaining construction labour productivity will mainly consider productivity determinants and sustainability theories. The confluence of these theories will only be interrogated through determinants of corporate social responsibility strategies, people-centred management aspects, sustainability learning objectives in training curricula for skilled workers, sustainability learning objectives in the training of semi-skilled workers, provision of decent working conditions and sustaining construction labour productivity performance.
- Sustaining construction labour productivity performance is a monumental undertaking and would require an overhaul from government policy formulation to implementation of modifications by construction companies. The expectation would be that a nationwide survey is undertaken but the task would be insurmountable. The study will thus be restricted to the major cities of Harare and Bulawayo, and some mining towns, which include Shurugwi and Ngezi. These major cities are resident to 90%, of the contractors in the Construction Industry Federation of Zimbabwe (CIFOZ) membership list and are experiencing considerable infrastructural growth compared to other towns. They are also resident to tertiary and vocational training institutions as well as relevant regulatory institutions. The mining towns are experiencing massive growth, in housing and mining administration infrastructure, on the back of investments in the platinum and diamond mining industries (Kazunga, 2013: online, Muyambo, 2019: online).
- Due to the inclusion of all trades within the study being impossible. Participants were limited to construction skilled and semi-skilled workers within the trades of brick and block laying, carpentry and joinery and painting. These are key trades that define critical paths of construction projects.
- Site / Project managers, Educators and Regulators were the only designations that contributed to the selection of indicators for sustaining construction labour productivity performance. These were deemed to be the most suitable since they work with, train or

inspect construction workers as they undertake their tasks. Accordingly, they relate best to the shortcomings with regards to the welfare and productivity of workers.

- The testing of a developed conceptual model would be envisaged under adequate conditions. Validating of the model was only undertaken through cross-validation and the use of secondary data.

1.8 THE ASSUMPTIONS

- It is assumed that statutory legal instruments on the construction industry will remain the same, during the period of the study. This enables the validity of responses as it reflects the existing literacy levels within the construction industry. Any curricula revisions in technical and vocational training institutions and training adjustments during the period of study will distort literacy levels of construction workers concerning existing challenges.
- Respondents are deemed to have valid perceptions with regards to sustainability or decent work aspects that affect them. This enables generalisable conclusions to be made from their responses.
- Construction skilled and semi-skilled workers are deemed to be the main drivers of labour productivity while unskilled workers are subject to their control. On the other hand, perceptions management are considered vital in validating the workers' perceptions. Therefore, perceptions collected from these workers are key to effecting any labour productivity improvements.
- The data collection period is also envisaged not to considerably affect the validity of the results. The data collection period of three months is deemed to have given respondents' ample opportunity to participate in the study.

1.9 RESEARCH DESIGN AND METHODOLOGY SUMMARY

1.9.1 Design

Positivism was selected as the philosophical foundation for this study. This was necessitated by the need to produce law-like generalisations through natural scientific application to societal issues, as are the sustainability aspects within the study. This philosophy culminated in the use of the deductive approach. This supported a quantitative research strategy with data being collected from selected respondents through the use of questionnaires. A cross-sectional survey research strategy was extended due to the

snapshot nature of the study and the need to collect a large quantity of data from various respondent groups.

1.9.2 Data collection

The population for the study consisted of construction companies registered with the Construction Industry Federation of Zimbabwe and based in Harare, Bulawayo and Shurugwi. Random sampling was utilised to select construction companies and from these project managers'/site managers' were targeted to participate through self-administered and emailed questionnaires. Also included were construction skilled and semi-skilled workers on thirteen (13) construction sites situated within the same study area. Construction sites were selected through the National Social Security Authority database. All construction skilled and semi-skilled workers, from the different classes, on these sites, were invited to participate and data was collected through interviewer-administered questionnaires. Tradespeople such as bricklayers, carpenters and painters were selected based on the premise that these are trades related to the critical path of construction projects and that they are benchmarked by the National Employment Council of the construction industry. Educators from technical and vocational training institutions and regulators from the National Employment Council of the construction industry, National Social Security Authority, Environmental Management Agency and National Manpower Advisory Committee also participated in the study. All the educators and regulators in the study area participated in the study and data was collected through self-administered and emailed questionnaires.

1.9.3 Data analysis

Quantitative data analysis was predominantly utilised in the study and undertaken through various methods within the Statistical Package for Social Science version 24. These methods included: Cronbach alpha reliability tests; normality tests; Pearson chi-squared tests; correspondence analysis and ranking; Mann-Whitney U tests; Kruskal-Wallis tests; Pearson bivariate correlation method and Regression analysis.

1.10 THE IMPORTANCE OF THE STUDY

The conditions of sustainability should be decomposed by sectors to successfully implement solutions to the challenges (Despotovic, Cvetanovic, Nedic & Despotovic, 2015: 5). Addressing sustainability at the national level could be a monumental task, however

dealing with the construction industry and specifically, labour productivity could be an important anecdote to remedying the challenge. The importance of developing a sustainable attitude towards construction labour cannot be overemphasised as the welfare of craftsmen must be in the best interests of the client and the contractor (Lill, 2008: 865). The production process of buildings creates a challenge, opportunity, and responsibility for creating a sustainable construction business and this includes the working conditions of the people that make it, the resources that go into production and the wastes that are generated (Des Jardin, 2005: 50).

Companies undoubtedly influence inequities in societies, economic recessions and degrading natural environments (Svensson, Hogevoold, Petzer, Padin, Ferro, Kloppe, Varela & Wagner, 2016: 287). Further complications emanate from countries focussing on growth-based models rather than development-based models, which would threaten corporate social responsibility on achieving sustainable communities (Des Jardin, 2005: 36). Development of sustainable communities indeed emanates from how construction business construes the communities in which they operate. The symbiotic correlation between the societal stakeholders or communities and companies, with regards to sustaining labour, is, however, difficult to ascertain. Also, accomplishing it is debatable as different narratives seek to inform a global model as averse to a localised model.

Choudhry (2015: 5) asserts productivity improves if site operations are safe therefore site managers need to promote safe work habits. Management is always a question of sustaining contradictions of interests of different parties (Lill, 2008: 865). The way construction work is managed has a direct bearing on workers' motivation and satisfaction. Warnock (2007: 432) supports this by reporting that the integration of policy and instruments between normative, strategic and operational levels of management is fundamental to achieving sustainability. Des Jardin (2005: 44) avows that sustainable companies acquire competitive advantages by improving morale, increased employee loyalty, healthier and more attractive working conditions. However, countries contrast in history, culture, language, and economic, environmental and social condition that varies management practices regarding sustainability (Zahid & Ghazali, 2015: 105). This contrast motivates for a critical analysis of how the management of labour productivity on sites' sustainability can be enhanced. The constructs of history and culture are essential to enable sufficient insight into how skilled and semi-skilled workers can be sustainably managed on construction sites.

Several academics including Murray and Cotgrave (2007: 7); El-Zein, Airey, Bowden and Clarkeburn (2008: 170), and Blewit (2010: 477) agree that education is essential to making changes to the industry to improve sustainability. Kagawa (2007: 319) implies that academics have agreed that there is no single framework, conceptualisation, and understanding of sustainability hence need for alignment to country-specific challenges. This appears a prerequisite to focusing on the root of the problem, which starts from re-evaluating the inherent culture and even how training and skills development is undertaken in the developing countries. Curriculum development should endeavour to embed the interconnectedness of the three dimensions of sustainability (Kagawa, 2007: 319).

Though methods of measuring construction labour productivity are considerable, including questionnaires, time studies and work sampling, (Gong, Borcharding & Caldas, 2011: 737) it is the consideration of the working conditions within which they are undertaken that is not sufficiently addressed. In Zimbabwe, for example, health and safety requirements and climate change aspects have inevitably considerably affected productivity, but productivity measures have remained constant. Relationships of labour productivity to different aspects (Gong, Borcharding & Caldas, 2011: 737, Chigara & Moyo, 2014a: 57)) have been undertaken but how it is affected by sustainability dimensions has been scarcely studied. Consideration of the decency of the working conditions will culminate in realistic standards that are beneficial in safeguarding construction labour and provide for a foundation for innovation in terms of construction methods utilised. This has the potential to revolutionise the measurement of productivity concerning assurance of decent working conditions.

Measurement of sustainability performance is dependent on the impacts of dynamic economic, social and environmental factors (Shen, Wu, Chan & Hao, 2004: 340). The variables within these broad factors are not easily recognisable and their differential impact is even more-so difficult to ascertain. Lack of a consensus on how the performance of social, economic and environmental sustainability productivities is measured and assessed (Burgess & Heap, 2012: 335) will spur the drive to credibly, timeously and steadily deal with their combined effect. The choice of variables for social, economic and environmental is contentious (Burgess & Heap, 2012: 334). Although studies have concentrated on the measurement of construction projects sustainability performance (Presley & Meade, 2010: 435; Akadiri & Olomolaiye, 2012: 666), the sustainability of labour is not specifically and emphatically dealt with. Not only are these detached from construction labour productivity sustainability, but they also do not reflect the reality of the fundamentals of developing

countries in terms of indicators and the level of impact of these indicators in measuring performance.

Abidin and Pasquire (2005:171) reveal that generally, sustainability is viewed as a cost enhancer limiting its acceptance. However, Despotovic *et al.*, (2015: 4) affirm that productivity enhancement and competitiveness can be achieved by improving environmental protection, increasing social security and growth of social justice. Despotovic *et al.*, (2015: 21) also assert that economic competitiveness should be amply assimilated with environmental and social sustainability, however, clarity lacks in explaining the complex phenomenon of these mechanisms. Wan and Ng (2016: 4,8) emphasise that construction sustainability approaches by developed and developing countries are not mutually adaptable hence a country-specific model is envisaged, with a significant social and economic sustainability focus. The significance of this study is paramount towards enhancing the welfare of workers and enhancing construction labour productivity. The highlighted benefits are fundamental to all construction industry stakeholders and achieving sustainable construction is envisaged.

1.11 THE OUTLINE OF THE STUDY

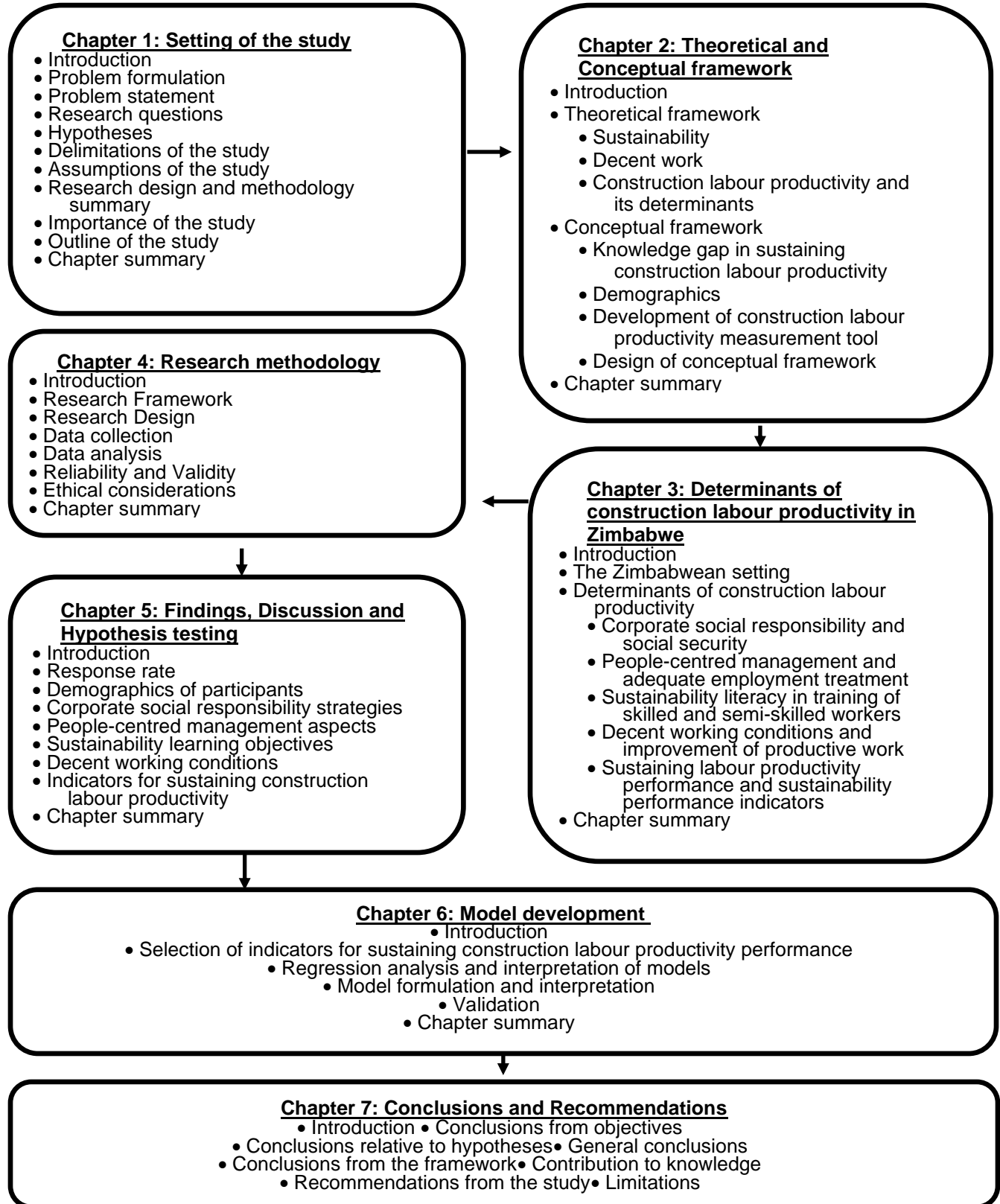


Figure 1.1: Outline of the study

1.13 CHAPTER SUMMARY

This chapter considered the setting of the study concerning the research issues that were interrogated. The problem of low construction productivity and lack of decent work for construction was ascertained through the various challenges affecting the Zimbabwean construction industry. The consequent research questions, objectives and hypotheses were then expounded. The delimitation of the study and assumptions of the study was further outlined to provide boundaries for the study. A summary of the research methodology utilised was also narrated. Justification of the study was made considering various studies with expected benefits being revealed. Finally, the outline of the research was illustrated diagrammatically showing the aspects that were considered in each chapter.

CHAPTER 2: THEORETICAL AND CONCEPTUAL FRAMEWORK

2.1 INTRODUCTION

The literature will be reviewed in two distinct approaches. Firstly, the theoretical framework which considers sustainability, decent work and construction productivity determinants inform the study was reviewed. Secondly, the conceptual framework which culminates in sustaining construction labour productivity performance was then outlined.

2.2 THEORETICAL FRAMEWORK

The theoretical framework is a result of engaging in the review of the literature with considerable focus, refining and integration of formal theory (Ravitch & Riggan, 2017: 11). Further to that, the combination or aggregation of formal theories is undertaken to inform aspects of the conceptual framework. Thus, in this study, the theories and concepts that inform sustainability and labour productivity are interrogated to expose the gap to sustaining labour productivity performance.

The narrative will first catechise the theories and concepts that inform sustainability and construction labour productivity. The dimension in which these two concepts are defined will then be uncovered to erect the boundaries of the study. It is imperative that the meaning of these dimensions within the scope of the study be divulged. The two concepts will be set in conditions that are defined by the determinants of the concepts within the Zimbabwean construction industry context. This then is interpreted to close the gap of achieving construction labour productivity improvement, by accomplishing decent work through integrating sustainable development dimensions within its construct. The development of a framework for the performance measurement of sustainability of construction labour productivity is thus undertaken through the adoption of indicators that are monitored and controlled within the industry. The details of the constituents of this theoretical framework are discussed hereafter and presented in Figure 2.2.

2.2.1 Theories of Sustainability

Kuhlman and Farrington (2010: 3437) depict sustainability as a concept that has shifted in meaning over the years. This presents different philosophical views on the subject and culminates in the adoption of vast theoretical and conceptual frameworks for sustainability. Loukola and Kyllonen (2005: 1) expose that sustainability is not a unified and coherent whole and that it affects the individual living, presents new challenges on science and

affects societal policymaking. They further state that it consists of distinct and conflicting canons whose emphasis has shifted from predominantly natural entities to the sustainability of human societies, cultural traditions and social institutions. Pappas (2012: online) reiterates that declining environmental, economic and social conditions require a response from the academic community. In considering the vastness of the theories, those that potentially align with the study of sustaining labour productivity have been briefly explained in Table 2.1 and include the capital theory approach, natural capitalism, complexity, systems approach and integrated and dynamic approach.

Table 2.1: Overview of sustainability theories

Sustainability Theories	Overview
Capital theory approach: Stern (1997)	Suggests simple rules to ensure sustainability and relatively simple indicators of sustainability.
Natural Capitalism: Hawken, Lovins and Lovins (1999)	Encourages proper valuation of the natural ecosystem by incorporating the following four factors in business <ul style="list-style-type: none"> • Resource productivity • Ecological redesign • Service and flow economy • Investing in natural capital
A new systems approach: Pappas (2012)	Focuses on a contextual approach to sustainability ranging, but not limited to, social/cultural, economic, environmental, technical and individual. Through these, realistic and careful assessment is undertaken to solve sustainability problems
Complexity Theory: Walby (2003)	Offers tools to help explain diversity and classic dilemmas in social science through explanation and analysis of causation.
Integrated and dynamic approach: De Wit and Blignaut (2000)	Suggests that sustainability is complex in the sense of the number and intensity of interrelationships between components, and dynamic in the sense of the real world-changing realities and transformation. It recognises complexities at lower scales of analysis

Source: Adapted from various authors

The capital theory approach emanated from the need to sustain economic growth through the advent of exhaustible resources (Stern, 1997: 148). Maack and Davidsdottir (2015: 1342) assert that the capital theory approach seeks to enhance human well-being through service flows from capital categories (human, manufactured, financial, social and natural), however, whilst the capital categories are complementary and substitutable, human capital is considered replaceable. Hence capital approach theory is argued not to adequately account for all the different elements of sustainable development. Added to this, it is suited to developed countries where capital categories are advanced (De Wit & Blignaut, 2000: 111).

Natural capitalism has been extended as a system that emanates from exploitation resources through massive production and consumption cycles (Sanchez, 2013: 184). It is enshrined like industrialised countries' need to move towards an industrial revolution that is self-sustaining. However, Birkin (2001: 55) argues that its emphasis is on capitalist' need to further their returns and improve their wealth and this presents a conundrum with the focus of this study on enhancing construction labour productivity through improving the welfare of workers. Further to this, Sanchez (2013: 178) exposes the seemingly impossible conflation of environmental issues and capital.

Brockmann and Girmscheid (2007: 220, 221) define complexity as the degree of manifoldness, interrelatedness, and consequential impact of a decision field. Manifoldness refers to the differentiation of functions and these could be client, designer, contractor, subcontractors, suppliers, banks, authorities, and the public or it could be the internal differentiation of the contractor's organization. The interrelatedness describes the dependencies between supersystem and the different subsystems or among the latter ones. However, the challenge with this theory, within the context of the study, is its emphasis on the number of elements as opposed to the relationship of elements (Girmscheid & Brockmann 2008: 22), and this is opposed to assertions by Pappas (2012: online).

In consideration that a holistic approach is envisaged, this study will derive the desired outcome through both the systems approach and the integrated and dynamic approach. The congruence of these two approaches through integration, dynamism and contextualisation is pertinent. Thus, according to Chan and Huang (2004: 135), achieving a healthy, sustainable community requires an integrated, dynamic and systems approach to addressing economic, environmental, and societal issues.

2.2.1.1 Integrated and dynamic approach

Integrating social, economic and environmental concerns is paramount to achieve sustainability and ecological integrity (Jabareen, 2006: 185). As such, this study intends to undo the piecemeal approach that focuses on one concern beyond the others to holistically sustain construction labour productivity. Jabareen (2006: 186) assures that the integrative approach brings together all stakeholders to build an overall framework from the specific situations in which different countries find themselves. De Wit and Blignaut (2000: 116)

compound the matrix by asserting that the integrative approach must take account of the dynamism of a sustainability system. To depart from a static approach, De Wit and Blignaut (2000: 117) describe the nature of the envisaged system as follows:

- An open system – matter and energy flow between the economic and ecological subsystems, and information and knowledge between the socio-cultural, economic and ecological subsystems
- A living system – human beings are ultimately responsible for the organisation and use of non-living components such as natural resources and ecosystem services
- A soft system – reliance on scientific truth only is not sufficient to address the sustainability crisis holistically
- It utilises the linkages between economics, environment and human activity to reveal the tensions between the economic and environmental systems
- It is a process of change thus exposing the dynamic and novel character of sustainability
- The degree and type of interconnectedness of the systems is an important variable of understanding the dynamics of sustainability

In support, Pero, Moretto, Bottani and Bigliardi (2017: 1) report on the importance of collaboration of various stakeholders in ensuring sustainability in the construction industry. However, their focus on supply chain and environmental aspects provide a different perspective. Thus, utilisation of the integrated and dynamic approach will enable comprehensive analysis and offer a responsive construction labour productivity narrative.

2.2.1.2 Systems approach

Fiksel (2006: 15) defines the systems approach as a framework for shifting industrial systems from a linear model to a closed-loop model thus providing a foundation for rethinking conventional process technologies. A systems view can thus inform as a decision-support tool, in collaborative decision making, which will enable more effective movement towards sustainability (Fiksel, 2006: 15). Pappas (2012: online) reports that the determination of the sustainability of a system depends on the evaluation of how the different factors influence each other and that a change in one factor is likely to result in an unpredictable change in other factors. The author further allays that solving the sustainability challenges requires perspectives and skills from individuals across disciplines through an examination of individual and corporate values. Chan and Huang (2004: 135)

support this view by stating that the systems approach emphasises identifying and describing the interactions between system components with the hope of connecting the broken linkages among the sectors of the community.

Cimren, Bassi and Fiksel (2010: 2814) allude to a new systems dynamics tool, T21-Ohio, which was developed to integrate comprehensive developmental planning through modelling the broader social, economic and environmental impacts. Fiksel (2006: 20) declares that sustainability is a systems problem which can only be solved by a coordinated effort from all stakeholders to achieve systematic change and such recommendations for its adoption were made as follows:

- Improve communications to educators, government, the media, and the general public to convey the urgency of sustainability challenges.
- Develop policy-formulation tools that recognise the complex, interconnected nature of ecological and socio-economic systems, including visualisation methods and appropriate metrics.
- Explore ways to introduce an awareness of ecological systems into commerce, as in the emergence of integrated management services and sustainable practices.
- Develop mechanisms for integrated dialogue among industry, government, and academia, shifting from an adversarial to a cooperative approach.

Sustainability within the construction is strongly modelled through the systems approach due to various attributes and their interconnectedness (Zabihi, Habib & Mirsaedie, 2012: 577). In support, Yilmaz and Bakis (2015: 2257) conceptualise sustainability within the construction sector through, though not similarly defined, various systems that contribute to an ideal environment. The similarity of the systems approach and integrated and dynamic approach adds to the suitability of their utilisation as they seek a holistic and responsive model for sustaining construction labour productivity.

2.2.1 Sustainability dimensions

Sustainability is concerned with issues of continuity and endurance and sets an approach to remedy social, economic and environmental challenges that face mankind (Murray & Cotgrave, 2007: 8). The sustainability concept seeks to integrate stakeholders' concerns to ensure basic needs, ecology, eco-efficiency and community empowerment are achieved (Virakul, 2015: 435). Williams and Millington (2004: 99) stress that sustainable development is obscure and disreputably difficult to define. Furthermore, the implementation of

sustainable development is inundated with complexities and conflicts the world over (Shrivastava & Berger, 2010: 247). Ratiu and Anderson (2015: 194) decry that clear understanding of sustainability continues to elude academics though there is an increase in interest and use of this concept. Yet, the growing effect of various global challenges has increased the need for the adoption of the sustainability concept (Virakul, 2015: 435).

Dimensions of sustainability have also been difficult to generalise as different countries have defined the sustainability concept differently. In Zimbabwe, Manjengwa (2007: 316) highlights the failure of sustainable development initiatives, such as District Environmental Action Planning (DEAP) modelled on Agenda 21, which was an environmental action planning process that sought to integrate environmental concerns with developmental planning. The author further reports that, contrary to it being a community based participatory approach, it was not grounded at the local level and was socially unsustainable as the people did not buy into it. Although it was internationally inspired, it was not adaptable to the Zimbabwean context and thus its demise. Du Plessis (2007: 71) also intimates that sustainability solutions for developing countries require holistic approaches defined by locally identified needs and value systems. For sustainability to be relevant within the African context, its definition, principles and criteria need to align to the continental values and worldviews. The African experience highlights a path to sustainability that draws on local initiatives (Du Plessis, 2005: 17).

Ratiu and Anderson (2015: 195) emphasise that the survival of the human system should be prioritised in conceptualisation and application of sustainability. Galla (2012: 112) acknowledges community cultural diversity as significant in tackling sustainable development and proffers culture as a dimension of sustainability. How culture is reflected in economic, social and environmental values is fundamental as a foundation for sustainable development going forward (Galla, 2012: 113). John and Narayanamurthy (2015: 215) reflect sustainability as having economic, environmental, ethical and social aspects to it. Piercy and Rich (2015: 287) expand on six dimensions as being relevant to achieve sustainability. These are environmental; workforce; supply chain; community; governance and quality issues. Koranda, Chong, Kim, Chou and Kim (2012: 699) refer to six key principles of sustainable construction, however, these fail to sufficiently recognise and expand specifically on labour. These components are interrelated and need to be inclusively addressed. Hill and Bowen (1997: 227) introduce four dimensions of sustainability as being: social; economic; biophysical and technical. However, they also

highlight that the choice of emphasis on dimensions for projects is informed by consensus among stakeholders. Greene, Crumbleholme and Myerson (2015: 444) present a model of four sustainability cultures: libertarian; campaigner; pragmatist and housekeeper, which are exuded by companies and employees in workplaces with the view of understanding why certain conflicts exist. Their inclination was on whose responsibility it was to enhance sustainability concerns.

Therefore, it is paramount that the boundaries within which sustainability is considered are defined. However, any interrogation within this study will be confined to Murray and Cotgrave's (2007: 8), as shown in Figure 2.1, confines of sustainability: economic, environmental and social. Shrivastava and Berger (2010: 250) relays that sustainability principles act as guides to the formation of frameworks, and the adopters of these frameworks are the different communities having different goals. These principles have regard for both local and global consequences and take a holistic perspective on assessing progress towards sustainable development.

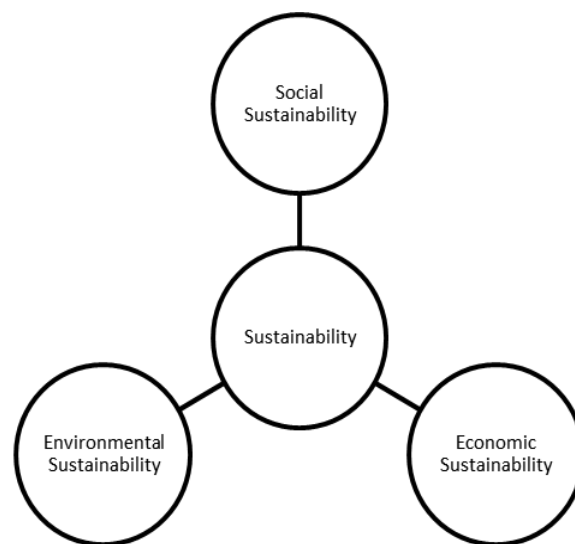


Figure 2.1: Sustainability dimensions

Adapted from Murray & Cotgrave (2007: 8)

2.2.2 Decent work

Stamerra (2016: 516) recognises the International Labour Organisation as a United Nations agency with the mandate of promoting the Decent Work Agenda. Further to this, the

principles of ILO include asserting that all human beings, without distinction of race, religion or sex, have the right to pursue their material well-being and their spiritual development in conditions of freedom and dignity, economic security and equal opportunities. ILO (2006: 2) reports that the decent work concept was initiated in 1999, as a primary goal to promote opportunities for both men and women to obtain productive work in conditions that encourage freedom, equality, security and human rights. The report further states that, though considerable work has been undertaken, several questions remain unanswered. One of these key questions is how the decent work approaches can be promoted within different countries with varied economic, socio-political and environmental structures. The ILO (2016: online) suggests that decent work substantive elements and indicators are not only borne out of the specific Sustainable Development Goal (SDG) number eight (8) on decent work and growth, but they should also be found within the other relevant development goals. These goals include goal number three (3) on good health and well-being, goal number four (4) on quality education and goal number five (5) on gender equality, amongst others. Hence, the relationship between decent work and sustainability development drive cannot be overemphasised and the need to amalgamate the two within the construction productivity discourse is inevitable. Further to that, Ghai (2006: 96) categorically states that increasing productivity is at the centre of the decent work agenda. Furthermore, the ILO (2019: online) reveals that decent work shortcomings lead to labour productivity losses and occupational illnesses.

ILO (2013: 12) advances the four pillars that embrace decent work as:

- International labour standards and fundamental principles and rights at work;
- Employment creation;
- Social protection, and
- Social dialogue and tri-partyism.

Ghai (2002: 2) asserts that whilst the first two pillars refer to opportunities, remuneration, security and conditions of work, the last two emphasise on the social relations of workers. However, all the pillars should not be treated in isolation and separation. ILO (2006: 4) reports that these pillars expose and invite analysis into trade-offs, complementarities and provoke questions on the universality and particularity to the world of work.

The robustness of the decent work pillars is dependent on the holistic, dynamic and integrative relationships with the links being self-evident (Hughes & Haworth, 2011: 43).

The key links that initiate this study are the effect of the employment pillar on social security that should benefit labour flexibility, innovation and productivity; the effect of rights at work on employment that influences a full spectrum of employment levels, patterns and policies; and the effect of social dialogue on employment that enhances innovation and policy changes for employment promotion. However, due to the dynamism and integrativeness of the pillars, all the other links are crucial. Ghai (2002: 4) reports that the differences in the integrity of the interdependencies of the decent work pillars have led classification of different countries within three different models varying the institutional and policy frameworks as shown in Table 2.2.

Table 2.2: Decent work models

Decent work model	Description
The classical model of decent work	<ul style="list-style-type: none"> • Considers high per capita income countries • 70-90% are in wage employment • Government expenditure varies from 25 to 50% of GDP • Social security expenditure is 15-33% in proportion to the GDP • Poverty is defined as the percentage of people with incomes below 50% of the median income • 25% to 50% of the workers are trade unions members • Collective bargaining coverage varies between 25 and 90%
The transition model	<ul style="list-style-type: none"> • Former Soviet bloc countries with middle-income economies • 80 % of the labour force is in wage employment • Government expenditure varies from 25 to 50% of GDP • Social security expenditure is 10-25% in proportion to the GDP • Low trade union membership • Low collective bargaining coverage
The development model	<ul style="list-style-type: none"> • Considers the majority of low-income countries and some middle-income countries • Labour force wage employment varies from 15-70% • A higher percentage of government expenditure of GDP • Lower social security expenditure varying from 10-13% • Trade union membership of 10-15% for the majority of countries • Low collective bargaining coverage

Source: Adapted from Ghai (2002: 4-8) and Ghai (2006: 5-6)

The classical model of decent work is best suited to developed countries, the transition model to countries transforming from communism to free-market economies and the developmental model to developing countries (Ghai, 2006: 3). Due to these classifications, the decent work concept should be characterised based on consensus within these three groups. However, the universal approach fails to recognise cultural and national influences towards its achievement (Ferraro, Dos Santos, Pais & Monico, 2016: 87). Zimbabwe is a low-income economy characterised by high levels of unemployment and poverty which has led to rising levels of human exclusion (United Nations Economic Commission for Africa, 2017: 2). Insufficient formal employment has contributed to a desperate workforce which relies on informality (Zimbabwe Labor Market assessment, 2014: 1). Bhebhe and Mahapa (2014: 67) also bemoan the decline of trade union density due to various factors, that

include unemployment, and this has left workers exposed to exploitation and abuse by employers. From this analysis, Zimbabwe is contextualised, for the attainment of decent work objectives, within the development model and this sets the magnitude of aspects that need introspection and adjustments within the study. The continuous evolution of the decent work context is however important, especially for countries as Zimbabwe, as an increase in the integrability of disadvantaged workers is existent (Ferraro, Dos Santos, Pais & Monico, 2016: 92).

Adhikari and Pandey (2011: 64) reiterate that these pillars represent people's aspirations for opportunities and sufficient incomes; a voice at the workplace; stable families and personal development; and fairness and gender equality. They further intimate that the government, workers and employers must play a significant role to achieve these objectives. To achieve this three-way solution, it is paramount that all players' requirements are captured. Related to this, Balliester and Elshaikhi (2018: 1) also suggest five dimensions within which the future of work should be considered as the future of jobs; their quality; wage and income inequality; social protection systems; and social dialogue and industrial relations. Thus, the focus of this study on workers is well-founded and fundamental to finding lasting solutions to the existing problems. ILO (2008: 4, 35-38) recognises that measurable decent work substantive elements and indicators should capture the four pillars of decent work, mentioned above, and these substantive elements include:

- Employment opportunities
- Work that should be abolished
- Adequate earnings and productive work
- Decent working hours
- Stability and security of work
- Combining work and family life
- Equal opportunity and treatment in employment
- Safe work environment
- Social security
- Social dialogue and workers' representation
- Social and economic context of decent work
- Environmental context of labour administration

Ferraro, Dos Santos, Pais and Monico, (2016: 90) reiterates that the selection indicators must be accurate within situational contexts. Further to this, the selected measures, within

the indicators, must be relevant to issues of construction labour productivity and its sustainable development. Therefore, selection of indicators, as expanded in Section 3.4.5.1, within the specified decent work substantive elements was undertaken.

- Employment opportunities: Labour force participation rate; Employment by status in employment; Labour underutilisation
- Work that should be abolished: Forced labour rate
- Adequate earnings and productive work: Employees with recent job training
- Decent working hours: Employment with excess working time (44 hours per week); Time-related underemployment rate; Paid annual leave
- Stability and security of work: Precarious employment rate; Subsistence worker rate
- Combining work and family life: Unusual hours; Maternity protection
- Equal opportunity and treatment in employment: Occupational segregation by sex; Measure of discrimination (by ethnicity, of indigenous people)
- Safe work environment: Occupational injury frequency rate (fatal and non-fatal); Time lost due to occupational injuries
- Social security: Share of population above pensionable age benefiting from pension; Public social security expenditure (proportion of Gross Domestic Product); Share of economically active population contributing to a pension scheme, Social dialogue and workers' representation: Trade union density rate; Collective bargaining coverage rate; Days missed due to strikes and lockout
- Social and economic context of decent work, Labour productivity (Gross Domestic Product per employed person, level, and growth rate); Income inequality; Sustainable literacy levels
- Environmental context of labour administration: Environmental impact of labour administration

ILO (2009: 1) testifies that the most challenging and threatening aspect of globalisation is the rise of precarious employment which has undoubtedly diminished productivity. Cumulatively, ILO (2013: 1) recognises that decent work is a means of achieving equitable, inclusive and sustainable development. Further to this, decent work is integral not only to poverty reduction especially in developing countries but also to construction labour productivity growth and workers' welfare. Consequently, these substantive elements form the basis of the study within which performance indicators for sustaining construction labour productivity are identified.

2.2.3 Construction labour productivity and its determinants

Labour is still considered the most costly and difficult to ascertain component of a construction project (Jang *et al.*, 2011: 94), and remains a key construction planning concept with a direct relationship to the triple constraints of time, cost and quality (Ulubelyi, Kazaz & Er, 2014: 12). Equally, suppression of the construction industry, on the back of lack of investment, is still existent (Garwe, 2012: online) hence, efficient utilisation of resources is paramount.

Productivity has been topical across political, social and economic structures the world over but with very little understanding of its meaning (Stainer, 1997: 224) and it, particularly in the construction industry, has always been very problematic to measure and regulate (Motwani, Kumar & Novakoski, 1995: 18). Productivity is often narrowly interpreted with partial measures like the ratio of the total input to one input, labour productivity being the most common input (Stainer, 1997: 224) but this can give a misleading picture of the whole productivity concept (Djebani & Eltigani, 1996: 41). Mohanty (1995: 16) alludes to productivity being a measure of how well we convert resources into profit and emphasises the need for it to be cultivated and encouraged. The author further reported that despite it having a prominent place in organisations globally, confusion and ambiguity characterised its application. Productivity is simply the effective enhancement of an organisation's productive capability and capacity (Suito, 1998: 117). Mawdesley and Al-Jibouri (2009: 18) infer that construction holds the key to the prosperity of emerging and industrialised countries. A "culture" of productivity improvement will need to be "nurtured" across the business and supply chain if productivity is to be improved (Loosemore, 2014: 257).

The construction industry is labour intensive, hence the workforce should be an important asset (Jang *et al.*, 2011: 93). Therefore, it is important for construction organisations through their office and site management to effectively measure and improve the conditions that affect labour productivity on their job sites. Gouett, Haas, Goodrum and Caldas (2011: 1117) also report that, in the construction industry, on-site labour is one of the most variable and costly factors that affect project profits. Because of the variable nature of construction labour and its correlation with profits, construction managers require a comprehensive understanding of the activities of workers on-site. Piercy and Rich (2015: 288) refer to workforce issues being critical to sufficiently addressing sustainability concerns. They propagate four sub-dimensions: workplace operational issues, compensation, diversity issues and union relations as essential.

Identification and evaluating determinants that affect construction labour productivity have been done and continue to be carried out the world over (Soekiman *et al.*, 2011: 865). The variability of the construction industry and the construction projects themselves require constant adjustments and improvements concerning determinants that affect productivity. This is supported by the vast differences in determinants or indicators affecting labour productivity as studied in Canada (Jergeas, 2009: online), UK (Chan & Kaka, 2004: 3), New Zealand (Durdyev & Mbachu, 2011: 18) and developing countries such as Nigeria (Ameh & Osegbo, 2011: 56; Adamu, Dzasu, Haruna & Balla, 2011: 9), Indonesia (Kaming, Olomolaiye, Holt & Harris, 1997: 33; Alwi, 2003: online), Malaysia (Kadir, Lee, Jaafer, Sapuan & Ali, 2005: 42), Palestine (Enshassi, Mahomed, Mayer & Abed, 2007: 358), Kuwait (Jarkas & Bitar, 2012: 1070); Thailand (Makulsawatudom & Emsley, 2001: 281), Uganda (Alinaitwe, Mwakali & Hansson, 2007: 169) and Zimbabwe (Chigara & Moyo, 2014: 57). The shortcomings of these studies are the generalisation across national construction industries yet focus on the project level and more-so on work processes would unearth more accurate results. The extent to which these determinants impact and how previously ignored determinants may tend to increase in severity is paramount and has not been adequately dealt with by most researchers. This is compounded by particular attention on the significant factors and disregard of all other seemingly insignificant factors. Emphasis should be on improving labour productivity and related factors that capture aspects of labour management (Georgios, Vasiliki, Labros & Nikolaos 2014: 516) and its estimation and these should effectively include sustainability concerns.

However, a deeper appreciation of these is required to enhance labour productivity. As the nature of the determinants differs, even between different projects and tasks, a different approach is envisaged. Chigara and Moyo (2014a: 59) highlighted that labour productivity is affected broadly by external and internal factors. The importance of this categorisation was expanded by Durdyev and Mbachu (2011: 18) as they prioritised the determinants concerning their impacts. The variability of determinants and their impacts however sets all these determinants at the same weighting and this tends to affect the real impact of these factors. For example, the significant determinants affecting productivity in Zimbabwe were unavailability of material, late payment of salaries and wages, suitability/adequacy of plant, supervisory incompetence, and lack of manpower skills (Chigara & Moyo, 2014a: 57). On comparing unavailability of material and lack of manpower skills, though both were significant, the greater task in the implementation of corrective measures is fundamentally

different. While unavailability of material can be solved in the short term, lack of manpower skills can have far-reaching long term implications. Grouping of determinants that drive productivity in Turkey (Kazaz & Ulubelyi, 2007: 2132) and Zimbabwe (Chigara & Moyo, 2014a: 57) also tends to complicate the analysis of the impact of the individual determinants.

Such are the determinants affecting the developing countries where, in Zimbabwe, lack of skills, labour experience and incompetent supervisory (Chigara & Moyo, 2014a: 57), in Tanzania, poor workmanship is depicted on most construction projects (Kikwasi, 2011: 127) and in Zambia, poor quality and shortage of crafts skills (Muya, Price & Edum-Fotwe, 2006: 223). Similar to this in developed countries like Canada, according to Jeargas (2009: online), faced challenges of increased competition for labour, need for supervisory training and increases in several inexperienced workers. In New Zealand, amongst other determinants, included low levels of skill and experience and inadequate supervision (Durdyev & Mbachu, 2011: 18). Issues of management of productivity and skills inadequacies are prevalent within both developed and developing countries. These determinants should be considered as essential components, from policy perspectives, especially in addressing the need for feasibility. A holistic approach must be established by addressing the inadequacies of these determinants for the achievement of practicable construction labour productivity.

The nature of these determinants points to a need to expand the focus in modelling construction labour productivity to include, amongst others, issues of the labour productivity management, training and skills development. Relatively low productivity is a major determinant of the low levels of economic performance and increasing skills levels can significantly raise productivity levels. In the UK, there was a need to link skill development to wider productivity, competitiveness and business performance and securing employers' commitment to the skills productivity agenda (Giles & Campbell, 2003: 103). Total productivity management has been described as a particular approach to productivity improvement that aims to foster an organisational culture that ensures harmony from product design to process design through a range of tools and techniques (Suito, 1998: 117). Training has had a positive effect on craftsmen productivity with a 10% higher difference compared to untrained workers (Colombo & Stanca, 2014: 1151). The issue of training and skills development is mirrored in our constantly changing environment and the growing recognition that the quality of the learning process, allied to knowledge and skills

base, is a major capital asset of an individual, organisation or society (O'Donnell & Garavan, 1997: 136).

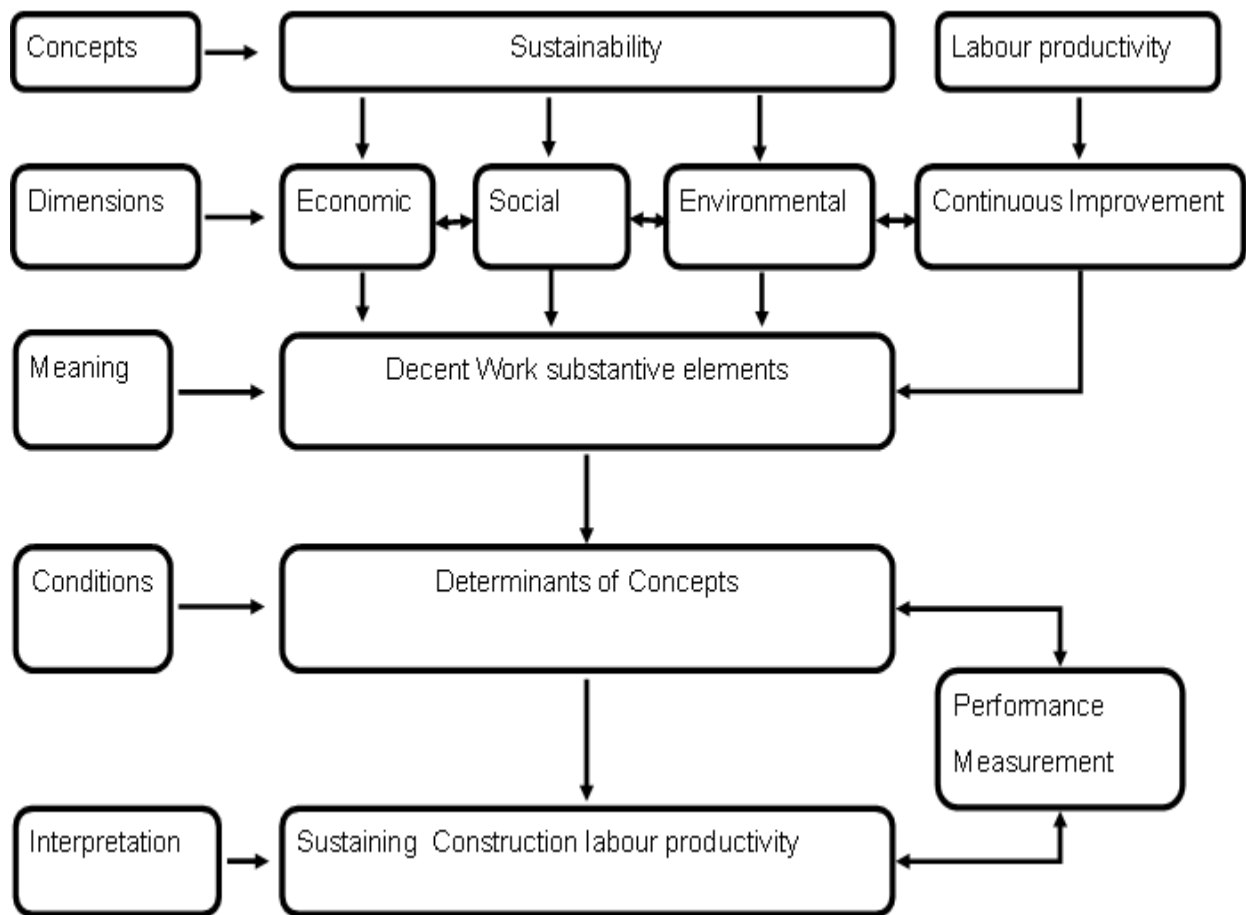


Figure 2.2: Theoretical Framework

2.3 CONCEPTUAL FRAMEWORK

Whilst a theoretical framework refers to the theory that a researcher chooses to guide their study, a conceptual framework is a synthesis of various theories or concepts to predict an event or process (Imenda, 2014: 189). Ravitch and Riggan (2017: 5) define a conceptual framework as a series of sequenced, logical propositions which are appropriately, rigorously and convincingly argued to ground the study and support its significance. Also, Leshman and Trafford (2007: 99) infer that the conceptual framework fulfils an integrating function between theories and provides for the determination of the research design strategies. The conceptual framework for this study was thus explicated from the theoretical framework and concepts within the area of study.

2.3.1 Knowledge gap in sustaining construction labour productivity

Sustainable construction concerns construction projects that promote environmental, social and economic gains today and tomorrow (Suliman & Abdelnaser 2009: 79). Since the construction industry has a large impact on the environment and community, hence it faces scrutiny from various stakeholders (Siew, Balatbat & Carmichael, 2013: 9). Innovative sustainability solutions are dependent on firms fostering 'sustainability cultures' to produce evident outcomes for the environment and society (Galpin, Whittington & Bell, 2015: 11). The built environment is constituted by projects initiated by human beings for social, economic and environmental purposes through effective project management (Agyekum-Mensah, Knight & Coffey 2012: 427). Though different approaches to sustainability have been suggested, the vision of an equitable, safe and healthy future for mankind remains paramount (Murray & Cotgrave, 2007: 9). Skare, Kostelic & Jozicic, (2013: 311) affirm that the sustainability of employee productivity is still in its infancy though resources management has been popularised in sustainable development.

Manewa, Rameezdeen, Amaratunga and Ginige (2007: 319) state that lack of productivity arises from inadequate apprehension of sustainability principles that include: dissatisfaction with work; poor health conditions; lack of education, knowledge, experience and training, conflicts with supervisors and bad opinions on-site management. Studies on productivity have also emphasised on motivation and education, however, education has a long term effect on sustainable productivity (Skare, Kostelic & Jozicic, 2013: 313). The intangibility and qualitative nature of determinants, including those that define sustainability, that affects labour productivity measurement present complexities that have prolonged this challenge (Laihonen, Jaaskelainen, Lonnqvist & Ruostela, 2012: 103). Variables considered in sustainable performance measurement and how they factor into the consequent reporting stimulate criticism amongst countries (Burgess & Heap, 2012: 356). Though indicators for performance measurement should be easy to develop, measure and evaluate this has not been the reality (Presley & Meade, 2010: 439).

Cumulatively sustainability in construction must promote and protect human health, promote employment and contribute to social cohesion and regional economic development. On the other hand, environmental ingenuities are chiefly influenced by government legislature and they require community and individual support to be successful. (Pun, Hui & Lee, 2001: 112). In light of this, Mariappanadar (2012: 168) asserts that human

resources must be managed sustainably to ensure a positive impact on communities. Banerjee (2013: 222) extended a model for sustainable human capital grounded in life cycle assessment for sustainable products. The considered variables though may not be replicated in other environments. Skare, Kostelic & Jozicic (2013: 327) determined the quantity and quality of work assignments that maximise long term workers' productivity. Maximisation of sustainable labour productivity should have a ripple effect on positively affecting social benefits and economic growth of the company. However, the environmental benefits of maximisation are unknown.

Shrivastava and Berger (2010: 248) advise that the scope of sustainable management has expanded and includes corporate social responsibility, environmental management, corporate ethics, sustainable human resources, stakeholder management, corporate governance, sustainable supply chains, and sustainable strategies. Kumar, Duhan & Haleem (2016: 10) further acknowledge "Top management perspective" as essential inputs and the most important factors to enhancing productivity as positive attitude and involvement of management; and good working conditions. Though this was within the manufacturing sector, this may also be relevant to the construction industry. Individuals managing projects should be ethically responsible to have minimal effect on the environment and society (Agyekum-Mensah, Knight & Coffey, 2012: 436).

Harty, Goodier, Soetanto, Austin, Dainty & Price (2007: 479) also expose construction labour challenges as being: reduction of skilled tradesperson; obsolete education and training structures; and need for improvement in health and safety, welfare and working conditions. Hence the emergence of the term "Sustainability literacy" where a sustainability literate person understands the need for change to a sustainable way of doing things individually and collectively amongst other factors (Murray & Cotgrave, 2007: 13). However, this must be examined across cultural contexts for it to be relevant in different countries (Banerjee, 2013: 230).

Shrivastava and Berger (2010: 251) relay that industry-specific principles have taken centre stage being premised on the idea that each industry has intrinsic common traits. These develop through the engagement of related stakeholders which include home-grown people to ensure recognition of diverse and changing values. Though human needs are priorities in sustainable development, jobs prospects and opportunities for skills development are not always guaranteed for the local populace. Almahmoud and Doloi (2015: 153) support by

reporting that more often than not, the result has been a collapse of existing training structures, reduction in skills base and spread of inequity within societies. The social aspect in developing countries is neglected with issues of inequity, health problems, poverty and illiteracy being dominant (Almahmoud & Doloi, 2015: 153).

Effective labour management, through effective environmental management, can benefit construction companies through financial savings in the reduction of waste, reduction of consumption of raw materials and improved production yields (Pun, Hui & Lee, 2001: 114). However, there is a need to explore more on how construction can contribute more to social equity albeit through employing and training local labour (Murray & Cotgrave, 2007: 11). Labour, as a resource, has a social and economic impact within the construction industry and thus proper designing and planning of this resource is envisaged to achieve optimal value (Agyekum-Mensah, Knight & Coffey, 2012: 436). Shrivastava and Berger (2010: 260) motivates that the sustainability challenge can be sufficiently solved by effectively dealing with its foundational principles, recognising that all industries, organisations and countries are unique. Focus on sustainability of construction is thus pertinent and paramount to sustaining construction labour productivity performance within the Zimbabwean context.

2.3.2 Demographics

Demographic trends are fundamental to the sustainability discourse. ILO (2013), ILO (2016b) and ILO (2018) are consistent on the need to dissect indicator measurements into demographic variables. Taking that into consideration, this study sought varied perspectives on the selection of these indicators with due attention of the demographic variables. Brennan and Cotgrave (2014: 317) supports consideration of varied respondent groups in this sustainability endeavour as it provides variability and the opportunity to explore diverse perspectives. Therefore, site managers, project managers, regulators and educators contributed to the selection of significant indicators for sustainable performance measurement of construction labour productivity. ILO (2018d: 25) states that trends differ between regions and countries with age, gender and training aptitudes being decisive. ILO (2018; 72) support disaggregation of labour statistics as crucial to the identification of critical issues and tendencies concerning specific demographic groups and to enlighten the devising of targeted policies. They further propose demographic variables of gender, age, education, occupation (designation), economic activity and status in employment as being the most widely used at the international level. The variables of age (generations), gender,

designation, experience and educational levels will be discussed separately hereafter. The consideration of experience is crucial and emanates from the occupation variable as an extension that seeks to qualify the different effects or inputs due to the years spent within the occupations.

2.3.2.1.1 Generation (Age)

The generation age range was set to non-overlapping age ranges to avoid conflicts and are described as shown in Table 2.3.

Table 2.3: Summary of generational characteristics

Generation	Description
Baby boomer (1946 - 1960)	<ul style="list-style-type: none"> • Protesting against power characterised the formative years • Though they were raised to respect authority they grew up not to “trust anyone over 30” due to their experiences, individualistic • They are in the late part of their careers • Believe that hard work and sacrifice are the price to pay for success • They are more process than result-oriented • Are confident, value health and wellness, seek job security and thrive on the possibility for change
Generation X (1961 – 1979)	<ul style="list-style-type: none"> • They aspire for work-life balance • Independent, autonomous and self-reliant • Not overly loyal to their employers • They value continuous training and skills development • Pragmatic, creative, are not motivated by money but demotivated by lack of it, individualistic but may also like teamwork
Generation Y (1980 - 1994)	<ul style="list-style-type: none"> • Value teamwork and collective action, are multi-taskers • Embrace diversity, adaptable to change and are optimistic, seek flexibility and a balanced life • Less demanding, highly educated generation, value training, most confident generation
Generation Z (1995 - present)	<ul style="list-style-type: none"> • Coming of age between 2013 to 2020 • Embrace diversity, adaptable to change, the most technically savvy

Source: Adapted from Tolbize (2008: 2, 3, 4), Fernandes, Hyde, Ives, Fleischer, Evoy and Van Marrum, 2012: online), Schroer (2008: online)

Whilst, ILO (2018: 73) considers age according to the working-age population, youth age and adults, this study considered age according to the generations the respondent belongs to.

2.3.2.1.2 Gender

Gender equality and gender balance are topical issues within the world of work and are emphasised in the sustainable development goals. This demographic driver is considered to have a significant impact on all sectors, including the construction industry, where there is need to not only open up employment opportunities but also to level the field in terms of treatment and remuneration (ILO 2018d, 2018: 25). ILO (2018: 2) reports that most

sustainability development goals targets are disaggregated to exclusively address gender disparities.

Ghai (2006: 2) acknowledge gender as a cross-cutting issue that should be fit into the concept and policies of decent work. Imbalance within the Zimbabwean construction industry is a cause for concern (Magwaro-Ndiweni, 2016:10). The gender perspective is emphasised in the thrust to promote and secure sustainable, full, productive and freely chosen decent employment for all the conditions of freedom, equity, security and human dignity for both women and men (Government of Zimbabwe, 2014: 25).

2.3.2.1.3 Designation

The designations that were considered in the study include site managers/project managers, construction skilled and semi-skilled workers (bricklayers, carpenters and joiners and painters), technical and vocational lecturers (brick and block laying, carpentry and joinery and painting), construction manpower development advisors (National Manpower Advisory Committee), health and safety inspectors (National Social Security Authority), environmental inspectors (Environmental Management Agency) and National Employment Council for the construction industry inspectors. Ghai (2006: 91) relays that indecent work is greatest amongst the less educated. These designations are considered to be vital to achieving the integration of sustainability dimensions within construction labour productivity determinants.

2.3.2.1.4 Experience

Experience levels are a qualification of designations that address aptitude and competence within the specific field. The study considers four different experience levels. These include those between 0 to 5 years who are at entry-level and have gained a bit of experience to make valid contributions to that study., Those between 6 to 10 years are more experienced compared to the first experience level and are more competent and exposed to more varied challenges in the construction industry. However, these two age groups have contributed to an increase in employee safety concerns within the Zimbabwean construction industry (Mhlanga, 2018: 12). Murray and Cotgrave (2007: 15) remark that the younger experienced has better potential for achieving sustainability literacy. Those that are between 11 to 15 years are senior workers in the industry and have considerable competence to also train within their vocations or professions. Lastly, those with more than 15 years are the most experienced respondents in the construction industry. These two groups can potentially enhance the validity and reliability of the study (Ulubeyli, Kazaz & Er, 2014: 16).

2.3.2.1.5 Educational levels

Educational levels reflect differences in skills acquired whether during training on-site or in-class. ILO (2018e: 22) report that though skills are not directly a decent work deficit, their lack is a substantial contributor to decent work concerns in the construction sector. ILO (2018: 61) also highlight the necessity of participation in education and training of workers as being a requisite for sustainable development. The levels of education in the study are those that are related to the designations considered herein and these include those with no ordinary levels, those with minimum ordinary levels, those with certificates, those with diplomas and those with degrees.

2.3.3 Development of construction labour productivity measurement tool

Christofi, Christofi and Sisaye (2012: 158) report that sustainability reporting emerged in the 1990s as means by which business organisations communicated their environmental and community responsibilities. However, the vast majority of proponents have concentrated on attempting to conceptualise performance indicators and their methods of assessment from an industrial sector perspective. The reason being that a fragmented approach would proffer better results in terms of intensively and extensively analysing the variables for each resource. The thrust is reduced by Jollands, Akroyd and Sawabe (2015: 146) when they raised the concern that management controls in sustainability remain distant, with profit-seeking intents still dominant, and this reflects a potential point of departure in pursuit of sufficiently addressing this challenge. The reality is that sustainability principles' practical effectiveness remains uncertain despite a great deal of effort having been devoted to them (Shrivastava & Berger, 2010: 246).

Conversely, the World Confederation of Productivity Science has identified that performance measures can only be probed at the country level since needed action is specific to individual countries and that factors for consideration are also dependent on perceptions by the industry (Akadiri & Olomolaiye, 2012: 683). Hence, no international standard criteria for measurement can be applied to the Zimbabwean construction industry without detailed situational research. Despite this, there is an underlying desire to learn from other countries' best practices with regards to productivity programmes (Kocer, 2014: 356). Crawford and Vogl (2006: 212) reiterate that impacts of management and organisational behaviour are not sufficiently considered, within the sustainability matrix, because of lack of decent measures.

Over the years, various approaches have been proposed on the sustainability performance measurement and reporting challenges with varied success. The differentials of these attempts are usable in the attempt to model a unique Zimbabwean methodology in measuring, reporting and improving the sustainability performance, especially of labour productivity. Van der Woerd and Van der Brink (2004: 173,177,180) proposed the use of a Responsive Business Scorecard as a strategy for integrating and reporting on sustainability. They purported that essentially social and environmental aspects should be elevated to be on equal footing with aspects of economic sustainability. While both quantitative and qualitative reporting is achievable for economic sustainability, social and environmental sustainability presents a challenge. They further intimated that the choice of the parameters to measure is subjective and their magnitude also needs to be reduced to those relevant for particular situations.

Shen *et al.*, (2005: 339,340,341,348) focussed on examining the feasibility of construction projects together with sustainability performance by utilising systems dynamics. Through this approach, a departure from the traditional method of measuring performance: time; cost; and quality, to identification and consideration of dynamic factors was anticipated. They further defined the project life cycle and economic, environmental and social dynamic factors were considered and mitigated to ensure optimal sustainability. The model appropriately assessed the dynamic impacts of the different factors but this was dependent on subjective weightings of the three sustainable contributors. However, the constricted consideration of only three contributors and their ensuing weighting should be based on extensive studies of construction projects, with particular attention to labour, within a specific area of study for them to be valid. Robinson *et al.* (2005: 13,14,17,19) surmise that the construction industry in the UK has utilised financial and non-financial measures to assess business performance while a rising number have embraced the excellence model and balanced scorecard model. They, however, emphasise that environmental and social issues were only limited to larger construction firms while the adoption of innovative approaches has been a challenge for construction organisations. Their findings were that one of the major barriers to adoption of performance measurement models was determining and monitoring indicators where companies would choose wrong measures thus reducing the integrity of the performance measurement. The other major problem was lack of data relating to the collection, collation and standardisation.

Christofi, Christofi and Sisaye (2012: 158,159,162,164) report that there were attempts on use of accounting method of the triple bottom line (TBL), though it was at initial stages of development, in sustainability performance reporting. Their view was that under voluntary TBL reporting, wealth maximisation takes precedence over all other issues hence need to enforce inclusions of environmental and social issues. They attributed standardisation and enforcement need being borne out of the Dow Jones Sustainability Index (DJSI) and the Global Reporting Initiative (GRI) engaging different disclosure methods. The social responsibility part of sustainability is, however, difficult to assess, yet its effects are as severe, compared to the other two principles of sustainability. They further report that the Dow Jones asserts that companies must be able to quantify and screen economic, social and environmental opportunities though the reality paints a difficult proposition. They proclaim that measuring and reporting sustainability performance is still voluntary and methods are not universal, with major inferences on sustainability indicators of performance.

Gadenne, Mia, Sands, Winata and Hooi (2012: 212) contribute by inferring that improving sustainability performance consists of translating overall objectives into specific practices for each key area of performance and specification of measurement indicators to assess actual achievement for each performance area. The variability of industrial sectors and sizes of the organisation concerning sustainability performance (Gadenne *et al.*, 2012: 224) warrants an introspection within the Zimbabwean construction industry. Szekely and Strebel (2013: 475) remark that it is challenging to balance credible performances of the three dimensions of sustainability. An integrated approach can be of much benefit as a holistic attitude is exuded through making sustainability a part of every organisational daily activity and developing a range of external partnerships. Occasional progress reporting and reactive statutory instruments will inculcate all stakeholders into buying into the sustainability drive.

Ratiu and Anderson (2015: 196, 203) proclaim that if the definitions are unclear, then measuring sustainability is inevitably made invalid. They further state that, within their area of study, the importance of the environment has taken precedence over social and economic issues when considering different professional contexts. Therefore they confirm that sustainability is seen differently by different actors with different priorities being emphasised. Hence, different professions in different industrial sectors are encouraged to develop unique understandings of sustainability within their contexts and prioritise actions

to deal with them. Despotovic *et al.*, (2015: 6) depict that The World Economic forum adjusted the Global Competitiveness Index to reflect demands of social and environmental sustainability through assimilation of their numerous indicators. Despotovic *et al.*, (2015: 7) attest that the derived concern is the assumption that there is no functional relationship between the three dimensions hence them assuming a linear relationship. Further to this, conceptual elements or indicators of the sustainability dimensions are industry and country-specific hence can not be generalised. The paramount issues of; locality, different statutory provisions on sustainability, differences of sustainability indicators, realistic differences of the weighting of each dimension, and the level at which performance measurement is to be undertaken therefore form the basis of the extended concept.

There is an inherent need to develop sustainability assessment tools that address the social, economic and environmental bottom line (Almahmoud & Doloi, 2015: 153). They further report that social performance is impeded by the complex relationship between social values and project stakeholders. Non-financial reporting is still very much unknown on sustainability performance issues, like human capital, conduct and governance (Siew, Balatbat & Carmichael, 2013: 7) and this is detrimental to transparency in sustainability performance. Previous sustainability assessment frameworks have failed to address the societal goal hence they have been inadequate (Almahmoud & Doloi, 2015: 155)

The variability of performance measures indicates a requirement for specific measures to effectively address this anomaly. Hence, the concept for performance measurement tools for sustaining construction labour productivity would invariably integrate the concerns highlighted herein and considered from the Zimbabwean context. The study on Zimbabwe thus provides an impetus on how developing countries can advance the body of knowledge through re-aligning their focus and prioritising on labour productivity trepidations. The motivation was more on solutions that can be implemented to advance the construction industry in terms of efficiency and effectiveness in project delivery and assimilation of sustainability principles.

2.3.4 Design of conceptual framework

In light of the highlighted studies and the Zimbabwean specific needs, the conceptual framework for sustaining construction labour productivity is thus captured in Figure 2.3. Briefly, the conceptual framework represents the confines and the relationship within this

study. The economic, environmental and social indicators, which are also synonymous with decent work, though not conclusive are considered within the sustainability concept. Construction labour productivity thus converges with the sustainability concept, especially in addressing those fundamental indicators within the determinants of corporate social responsibility strategies, people-centred labour management, sustainability literacy through technical and vocational training curricula for construction skilled workers, sustainability literacy through on-the-job training for semi-skilled construction workers and decent working conditions.

These determinants are then adapted to develop a framework for sustaining construction labour productivity through consideration of demographic consideration. The developed framework has to be measured through weighted indicators within the confines of the determinants that are related to decent work substantive elements. This ultimately generates feedback within the conceptual framework that supports short-term and long term interventions and continuous improvement can be achieved. Whilst the other variables have been considered within the theoretical framework, the demographic variables and the performance measurement tool will be considered hereafter as they are pertinent to the study's conceptual framework.

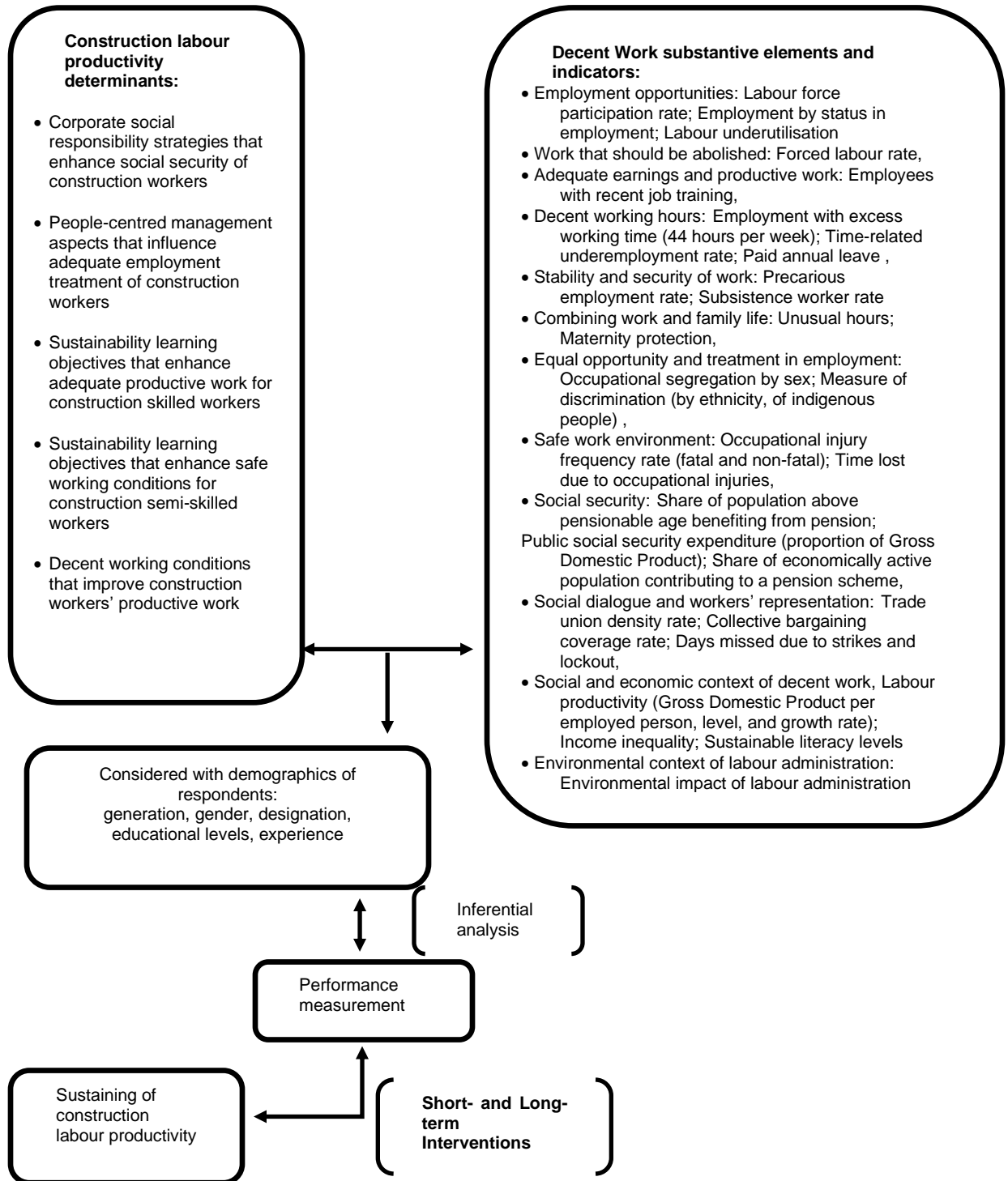


Figure 2.3: Conceptual framework for sustainable construction labour productivity

2.4 CHAPTER SUMMARY

This chapter considered the theoretical framework and conceptual framework for the study. The theoretical framework considers the utilisation of the integrated and dynamic together with the systems approach for the study. Sustainability dimensions situated in the Decent Work Agenda and construction labour productivity determinants are key elements within the framework that contribute towards sustaining construction labour productivity.

The conceptual framework contributes to knowledge through assimilating economic, social and environmental sustainability dimensions, situated in decent work substantive elements, into construction labour productivity determinants. Further to that, the performance measurement of sustaining construction labour productivity is envisaged through derived models. Demographic differences are considered pertinent in the derivation of these models and consequential formation of short and long-term interventions and continuous improvement is expected.

CHAPTER 3 DETERMINANTS OF CONSTRUCTION LABOUR PRODUCTIVITY IN ZIMBABWE

3.1 INTRODUCTION

In this chapter, the historical background of sustainability in Zimbabwe is revealed. The literature on the determinants of sustaining construction labour productivity is then reviewed to expose the gaps within existing trends. The indicators that inform the performance of sustainable construction labour productivity are also analysed whilst expanding on the gap that exists within the specifics of the Zimbabwean construction industry. Finally, the chapter summary is provided.

3.2 THE ZIMBABWEAN SETTING

The United Nations General Assembly, in 1983, established an independent commission that birthed the World Commission on Environment and Development in 1987 whose prerogative was to drive the sustainability agenda (Government of Zimbabwe, 2012:12). Zimbabwe's political commitment to the sustainable development agenda has been consistent with the Global initiatives through the operationalisation has been piecemeal and lacklustre (Zim-asset, 2013: 8). Table 3.1 illustrates the progression of the initiatives in Zimbabwe.

Table 3.1: Progression of sustainable development initiatives in Zimbabwe

Year	Event
1992	The high-level political participation in the Earth Summit and signatory to the Earth Charter
1995	National Environmental Statistics committee established, national sustainable development indicators set up by the Ministry of Environment and Tourism
1996	A second national state of the environment report
1997	Participation in the Rio+5 process
1998	The first draft of the Environmental Management Act
2002	Enactment of the Environmental Management Act (Chapter 20:27) Participated in the World Summit on Sustainable Development whose outcome was the Johannesburg Plan of Implementation where the sustainable agenda was broadened to integrate poverty, the environment and natural resources use.
2004	Development of a national response document "Zimbabwe National Response to the Johannesburg Plan of Implementation" targeted towards economic, environmental and social issues.
2013	Implementation of the Zimbabwe Agenda for Sustainable Socio-Economic Transformation for achieving sustainable development and social equity anchored on indigenisation, empowerment and employment creation.

Source: Adapted from Government of Zimbabwe (2012:1-9) and ZIMASSET (2013:6)

It is apparent that the initiatives were more focused on environmental issues initially and progressed towards broader aspects as the sustainability agenda developed. They are however other legal instruments, like the National Social Security Act, Labour Act and Public Health Act that had been or have been promulgated within the country that has indirectly influenced the sustainable development agenda and these are examined later within the

chapter. The current economic blueprint seeks to guide national development to achieve sustainable development in all sectors of the economy (ZIMASSET, 2013: 8). The blueprint further remarks that the utilities and infrastructure sector is one such sector that requires major improvements. The Government of Zimbabwe (2012:12) emphasises focus on the sustainable development concept, green economy (green jobs) and an institutional framework for sustainable development. Thus, any sectorial emphasis should entail these aspects.

This study is inclined towards the construction sector and more specifically sustaining construction labour productivity. Some aspects form the backbone of what must be achieved within the construction industry in terms of the study area. The Government of Zimbabwe (2012:11, 12) and ILO (2018c: 38, 53) highlight the origin and focus of the aspects in Table 3.2. Though it seems that an increasing number of legal instruments have been adopted for green jobs, the practice is not widespread in Africa (ILO, 2018c: 85). Sustaining construction labour productivity will thus be achieved through critically addressing these key aspects in Table 3.2.

Table 3.2: Key aspects of sustainable development

Aspect	Origin of aspect
Sustainable development concept	Brundtland commission report: "as development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs"
Green economy	United Nations Environment Programme: "A green economy is one that results in improved human well-being and social equity, while significantly reducing environmental risks. It is low-carbon, resource-efficient and socially inclusive and entails environmental sustainability and decent work"
Green jobs	These are jobs that: reduce consumption of energy and raw materials, limit greenhouse gas emissions, minimise waste and pollution, protect and restore ecosystems and enable enterprises and communities to adapt to climate change
Institutional framework for sustainable development	United Nations: Commission on Sustainable development "Establishment of National Sustainable Development Committees or councils at the national level"

Source: Adapted from Government of Zimbabwe (2012:11, 12, 13) and ILO (2018c: 38, 53)

3.3 DETERMINANTS OF CONSTRUCTION LABOUR PRODUCTIVITY

A review of the fundamental aspects within the determinants of corporate social responsibility strategies that enhance the social security of construction workers and people management aspects that ensure adequate employment treatment of construction workers is undertaken. Further to that, sustainability learning objectives that enhance adequate productive work of skilled constructions workers and ensure safe working environments for

semi-skilled workers are also reviewed. Also, decent working conditions that contribute to construction labour productivity are revealed and decent work indicators for sustaining construction labour productivity performance are explained.

3.3.1 Corporate social responsibility

Social responsibility in Zimbabwe is so fundamental that organisational resources may depend largely on the level of social commitment of that organisation and it entails undertaking actions that earn trust and respect from all stakeholders (Chaneta, 2013: 55, 56). Matimba (2012: 14) suggests the common elements of corporate social responsibility as voluntary commitment, beyond compliance behaviour, ethical behaviour, stakeholder involvement, accountability and transparency. Filho, Wanderley, Gomez and Farache (2010: 297) propose that a company can use corporate social responsibility activities to enhance the quality of its business environment and improve its competitive context. Bevan and Yung (2015: 309) also report on the need for construction companies to improve on implementing strategies that address environmental and social issues. However, corporate social responsibility in Zimbabwe has been increasingly used for enhancing corporate images (Masuku & Moyo, 2013: 113) on one side, but on the other side, local communities need meaningful engagement through bidirectional communication (Msweli & Wushe, 2014: 15).

Zahid and Ghazali (2015: 101, 102) contend that corporate social responsibility activities cover environmental (covering aspects of energy, water use, emissions, effluents and waste), social (include labour practices, decent work, human rights, society and product responsibility) and economic (impact of economic conditions and systems) aspects. Smith and Sharicz (2011:74) report that corporate social responsibility has been empirically found to be a marginal activity in company practice. However, Matimba (2012: 15) relays a need for increased attention to corporate social responsibility due to drivers that include concerns over pollution, waste, natural resource depletion, and climate change. Smith and Sharicz (2011:74) also remark on the importance of company shareholders and customers' buy-in to ensure corporate social responsibility activities are successful.

Ahern (2015: 497) recognises one of the underlying sustainability issues impacting companies as the need to work towards a universal, non-discriminatory approach to human welfare that is not ethnocentric, nationalist or regionalist. Whilst Bevan and Yung (2015: 295) acknowledge that activities in the construction industry have an injurious effect, increased pressure from stakeholders continues to encourage companies to act in socially

responsible manners. Will (2008: 234) asserts that, whilst the well-being of workers must be stabilised and enhanced, respect for the carrying capacity of ecological and social systems is also important. However, Ncube (2012: 10) advances reasons for failure to achieve this humanistic goal as lack of corporate social responsibility knowledge, conflicting stakeholder objectives and competitive disadvantage.

Matimba (2012: 16) discloses that corporate social responsibility has failed to mitigate the tripling global ecological footprint, increase in communities with no access to sanitation and increasing in unethical corporate behaviour like corruption. Min-Dong (2007: 65) also reveals potential confrontation between what society requires and what companies are prepared to implement culminating in disdain of the companies within the communities they operate. Kakava, Mbizi and Manyeruke (2013: 679) report that, as shown in Table 3.3, the private sector is largely concentrating on philanthropic activities rather than developmental activities.

Table 3.3: Sustainable development activities versus philanthropic activities

Sustainable Development	Philanthropy
Infrastructural development	Food aid
Direct Investment	Donations
Joint ventures	Scholarships
Technological transfer	Caring for the poor
Political Intervention	Health Education

Source: Kakava, Mbizi and Manyeruke (2013: 679)

They further relay that such activities are incessant and have lost their social impact. Construction of health care centres, classroom blocks, houses, the supply of furniture and books are common corporate social responsibility strategies (Dziro, 2014: 65) but do not relate much to what is required of construction companies concerning the welfare of the construction workforce. Matimba (2012: 15) bemoans that whilst corporate social responsibility in Africa is gaining prominence, it is usually associated with philanthropy. Galbreath (2009: 121) asserts that corporate social responsibility strategies do not have to be confined to an altruistic end (philanthropy) or an ethical obligation. Rather it should consider the six dimensions of the corporate strategy thus contributing to good management practice and societal welfare (Galbreath, 2009: 121). Conversely, sustainable development activities avoid dependence syndrome and empower the communities (Kakava, Mbizi & Manyeruke, 2013: 680). Further to this, issues of consultations on development priorities and training were deemed fundamental for successful engagement with corporates.

3.3.1.1 Types of corporate social responsibility strategies

Corporate-level strategies are those that are concerned with the overall scope of the organisation and how value can be attained (Johnson, Scholes & Whittington, 2008: 7). Galbreath (2009: 110) conceptualises a strategy as a firm's mission or long-term goal that includes the improving internal resources (assets, skills, competences, relationships, finance, and facilities) that are necessary to successfully compete.

Consideration of all these components is critical. More-so the need for resource configuration (Galbreath, 2009: 110), concerning Zimbabwean construction companies in the thrust to sustain the workforce. Whilst most companies in Zimbabwe report that they are involved in corporate social responsibility practices, the majority alludes that it is mainly a way of managing consumer relations (Manuere & Majoni, 2016: 69). As stakeholders are core, corporate social responsibility strategies should be adopted to deal with their varied needs and create value. The effectiveness of these strategies is dependent on a firm's unique capability (Fang, Huang & Huang, 2009: 122). They further attempt to distinguish between the types of strategies as shown in Table 3.4.

Table 3.4: Description of corporate social responsibility types of strategies

Reactive Strategy	Accommodative strategy	Defensive strategy	Proactive strategy
Strategies are formulated to respond to stakeholders' demands	Appropriate strategies are formulated to respond to stakeholders' demands but the demands that are detrimental to the firm's current situation are suppressed or changed	This is a pre-emptive allocation of related resources to adapt to the possible change in demands of the stakeholder through predictions in the environmental scanning systems	When firms use their influence to shape the stakeholder's demands to benefit the organisation as well as to satisfy and become proponents of the industry

Source: Adapted from Fang, Huang and Huang (2009: 122)

Griffin (2013: 105) describes reactive strategies as those that do as little as possible to solve social or environmental problems as they typically deny or avoid accepting responsibility. Companies that initiate reactive strategies reject any form of ethical and social responsibility that does not culminate in economic benefit (Ganescu, 2012: 93). Bass (2018: online) also report that reactive strategies are characterised by continually re-building broken relationships with communities in efforts to get new businesses, however, this is not sustainable in the long term. Thompson (2019: online) asserts that reactive strategies solely respond to unanticipated events and thus are unplanned and ineffective within

communities. Chang (2015: 455) confirm that reactive strategies aid short term interests through adapting to stakeholders' immediate requests.

Accommodative strategies are set to meet legal and ethical obligations where companies voluntarily participate in social and environmental programs, however, the same companies need to be convinced that the programs are worthy of their support (Griffin 2013: 106). Ganescu (2012: 93) also relay that accommodative strategies support certain ethical responsibilities without initiating voluntary actions for the common good.

Griffin (2013: 106) report that defensive strategies are only set to meet legal obligations and do not go beyond that. Ganescu (2012: 93) also intimate that companies with a low level of innovation ordinarily choose to implement defensive strategies. Further to that, these companies naturally reject to implement ethical responsibilities within their communities. D'Amato, Henderson and Florence (2009: 4) confirm that these strategies are set as a response to being targeted by activists.

Bass (2018: online) allay that the proactive strategy requires the company's foreknowledge and creativity and adoption of strategic approaches to decision making. Companies have the freedom to make their own decisions on the type and extent of involvement and are better prepared to deal with any challenges (Thompson, 2019: online). Griffin (2013: 106) also views proactive strategies as part of fulfilling the citizenry role of the company in a community and they always seek opportunities to contribute. Ganescu (2012: 93) emphasises that such organisations have a high level of innovative capacity within their human capital. They further report that companies that implement proactive strategies fully recognise social responsibility and they initiate active community engagements to meet stakeholder needs. Chang (2015: 455) elucidates that companies that implement proactive strategies have open relationships with their communities that enable long term interests to be met.

Construction companies in Zimbabwe need to implement proactive corporate social responsibility strategies as these have the most benefit to their workforce, the communities in which they operate and the organisations themselves. The benefits include enhanced workers' welfare, sound relationships with communities that enhance opportunities and enhanced innovation that advances the company.

3.3.1.2 Benefits of corporate social responsibility

Will (2008: 239) suggest that corporate sustainability potentially enhances the competitiveness of companies by exploiting opportunities and reducing risks associated with current global trends like climate change. Christofi, Christofi and Sisaye (2012: 158) support research on corporate sustainability being able to unearth the safeguarding of the human population and protecting the environment. Ncube (2012: 110) describes several benefits that can emanate from corporate social responsibility that includes innovation and competitive advantage. Filho *et al.*, (2010: 298) assert that corporate social responsibility creates significant benefits for companies in terms of reputation, returns and motivation and loyalty of employees. Further to this, competitive advantage can be achieved and sustained when corporate social responsibility activities create real and consistent results for the society. Gond *et al.*, (2010: 12) demonstrates that by companies implementing corporate social responsibility activities that enhance their image and reputation, prospective employees are also enticed to those companies. Further to that, corporate social responsibility activities directed towards employees are perceived positively by prospective and actual employees of those companies.

Holistically, Bevan and Yung (2015: 303) and Filho *et al.*, (2010: 306) expand that companies benefit from effective corporate social responsibility through uncommon, exceptional, unique and prized elements and resources that include improved reputation and image, retention of extraordinary human resources, better economic performance in terms of enhanced productivity, innovative and efficient projects, better environmental performance and better social performance. Gond *et al.*, (2010: 35) emphasise that when companies implement corporate social responsibility activities this potentially pushes their employees to engage in both efficient and socially responsible behaviour. Angeloni and Borgonovi (2016: 476) also confirm that companies can potentially benefit through an increase in labour productivity and profitability if they invest in corporate social responsibility activities that ensure young people are gradually incorporated into their workforce within the communities they operate. Wuttke and Vilks (2014: 121) infers that companies potentially can have a positive impact in their internal working conditions, enhancing productivity, and promote improvement in social and environmental conditions through institutionalising corporate social responsibility. Ganesu (2012: 94) reiterates that companies have to carefully select corporate social responsibility strategies that benefit the organisation (improving reputation and image, enhancing operational efficiency, increasing

financial performance, increasing customer loyalty), the employees (enhanced motivation, improved teamwork, lessened conflicts, developed social solidarity, purging of unethical practices), the society (promoting social inclusion, improving stakeholder cooperation) and the environment (reducing the impact on nature, reducing energy consumption, promoting recycling and reuse).

Ganescu (2012: 96) encourages companies to embrace vibrant and robust ethical practices that respect stakeholders' needs, influence and competitors and society to uphold human rights and approve social practices that develop human capital. Further to that, companies are encouraged to be active promoters of sustainability values to competitors and society including the adoption of best environmental practices. Wuttke and Vilks (2014: 121) allay that a competent approach to corporate social responsibility culminates in a win-win perspective where the community enjoys sustainable benefits and the company can enhance its profitability. This plethora of benefits that can be accrued from implementing corporate social responsibility strategies should spur construction companies to effectively plan, implement and monitor such strategies within their communities.

3.3.1.3 Corporate social responsibility strategies

Firms who begin to explore how to build corporate social responsibility into strategy are likely to reap rewards of improved competitive advantage and benefit the society at large (Galbreath, 2009: 122). Hancock (2015: 3) confirms that corporate social responsibility has been linked to various advantages to the firm through strategies such as shown in Table 3.5, and the belief is that this can cascade to developing countries.

Table 3.5: Example of employee corporate social responsibility strategies

Corporate Social Responsibility behaviour	Strategic examples	Strategic outcome
Employee benefits	Day-care Flexible hours Health/wellness	Loyalty and morale Productivity gains

Adapted from Hancock (2015: 3)

Various authors have proffered corporate social responsibility strategies that can potentially directly or indirectly enhance the welfare of construction workers at the workplace and within their communities.

3.3.1.3.1 Environmental issues that transfer good practices to communities

Iyortsuun and Akpusugh (2013: 2) motivate that employees' lifestyles are dependent on surrounding economic, social and environmental factors. Therefore, Karapetrovic and Willborn (1998: 204) relays the need to amplify the quality of goods and services through environmental management and workplace health and safety amongst others. United Nations Environment Programme (2005: 5) also exposes that the interface between community participation and environmental management is paramount for a holistic and consensus-based approach towards achieving sustainable development at the local level. For the effectiveness of environmental management, the workforce has to be well trained and encouraged to replicate such attitudes even within their communities (Theyel, 2000: 264). Such training should include conservation of natural resources during construction work and safe handling of hazardous substances. The learner must be able to understand conservation and preservation strategies on construction sites (UNESCO, 2017: 40). Thus, an environmental management culture is established within the communities and this guarantees the welfare of workers, their families and the citizenry.

3.3.1.3.2 Involve employees in decisions that affect their work environment

Rucker (2017: 17) allays that wellbeing of employees is negatively affected by poor work environments. Mas-Machuca, Berbegal-Mirabent and Alegre (2016: 200) resolve that work environment and employee outcomes improve as employees are provided with autonomy in decision making. The workers themselves can contribute towards their work environment by being given opportunities to contribute innovatively. When these work environments are sufficient for workers to fully express themselves, they are well being is improved and this cascades to their immediate families and society at large.

3.3.1.3.3 Outplacement services, retraining and severance benefits

Outplacement is a support service provided by organisations to assist former employees to attain new jobs (Gribble & Miller, 2009: 3). Functional jobcentres should facilitate workers to be outplaced to recommend for further training when workers have been retrenched. This can be achieved by ensuring that the workers gain relevant skills during their tenure within construction companies. Rucker (2017: 10) states that outplacement services are important as they provide an opportunity for the retrenched to be skilled in new jobs to enable them to be re-employed. Further to this, they report that the key humanistic approach is the

provision of such an opportunity to do so. However, in times of economic depressions, companies may desist from such facilitations as they fear that their workers can end up being their competitors within the industry. This, however, can be circumvented by establishing a symbiotic relationship characterised by trust through such corporate responsibility strategies. Gribble and Miller (2009: 19, 20) also argues that outplacement does not assist the retrenched and the effects of retrenchment through counselling and it lacks a holistic approach to the retrenches job loss.

Further to outplacement services, Alewell and Hauff (2013: 483) attest that employers offer severance benefits to employees as a social responsibility and as a way of maintaining a good reputation within the labour market as opposed to compensation for past work performance. Failure to regulate the offering of severance benefits by companies has affected retrenched workers as they are disadvantaged by either failing to get their severance packages or getting it as cash amounts that can not sustain them and their families.

3.3.1.3.4 Training on life management, retirement planning and care of dependents

Iyortsuun and Akpusugh (2013: 2) highlight that employees and retirees in Nigeria are increasingly encouraging for more training in retirement planning. Whilst, retirement planning can be considered essential, the duty of undertaking it is not regulated by law and construction companies are not inclined to provide for it. This continuous advocacy can comprehensively aid the workers and considering it within social dialogue deliberations could immensely motivate for its widespread implementation. Related to this, Baptiste (2008: 2) allays that childcare provisions are affected due to lack of training in balancing work and life of most single parents and dual-earning parent households. This equips workers for adequate standards of living beyond their active work lives and to appreciate the value of investing in acceptable care of dependents.

3.3.1.3.5 Flexi-time and work-life balance policies

Lazar, Osoian and Ratiu (2010: 202, 203) describe work-life balance policies as organisational programs that enhance employees' performance by reducing work-life conflict through maintaining satisfactory levels of an employee's involvement in their multiple roles in life. They further pronounce flexi-time as an organisational strategy that

allows employees to self determine their working time to enable them to meet foreseeable and unforeseeable personal and family commitments. Deery and Jago (2015: 467) extend that addressing work-life elements through candid interest from managers in the well being of their employees' families and their personal lives leads to retaining of most talented staff and contributing to continuity within the organisation. Pasamar and Cabrera (2013: 971) also contend that the changing socio-economic and environmental pressures are pertinent for employers to embrace work-life balance issues.

The importance of work-life balance and flexi-time concepts within construction companies is undeniable as Baptiste (2008: 2) reiterate that work-life balance difficulties are affecting both white and blue-collar employees. Lazar, Osoian and Ratiu (2010: 207) support the implementation of work-life balance by highlighting that organisations benefit through: reduced absenteeism; improved productivity; enhanced organisational image; employee loyalty and commitment; increased retention of a valuable employee; reduced staff turnover. Mas-Machuca, Berbegal-Mirabent and Alegre (2016: 201) also confirm work-life balance and organisational pride leads to improved workers' job satisfaction. Lazar, Osoian and Ratiu (2010: 208) further outline the benefits of work-life balance to employees as increased job satisfaction; a greater sense of job security; enhanced control over work-life environment; reduced job stress levels; better physical and mental health. Implementation of policies that consider flexi-time and work-life balance is pertinent due to the benefits alluded to, however, this requires an overhaul of the whole construction workers policies so that adequate alignment is achieved.

3.3.1.3.6 Policies that ensure the well-being of employees

Litchfield *et al.*, (2016: 9) assert that wellbeing has become paramount in recent years with the thrust towards the development of a meaningful and sustainable society. They further allay that the organisational and workers' wellbeing are intricately interconnected invariably towards exploiting return on capital and delivering commercial success. Baptiste (2008: 2) state that the social context within communities contributes to the personal wellbeing of workers in the workplace, however, workers look to employers to achieve basic physical and mental needs, physical safety, health and a feeling that they can cope with life. Le, Zheng and Fujimoto (2016: 959) extend the necessity of employee treatment of respect, dignity and open-door policy as enhancing job satisfaction and overall employee well-being within their workplace and community. Construction projects fit into the high-performance

work system concept and achieving this requires a happy and satisfied workforce whose well being is very high (Huang *et al.*, 2016: 306). Sutherland (2017: 2380) reflects that due to the absence of a standard framework for measuring employee wellbeing, a plethora of concepts has been widespread with no definitive conclusion.

3.3.1.3.7 Discrimination, corruption and harassment policies

Worsfold and McCann (2000: 254) state that management attitudes and organisational climate need to be addressed concerning harassment of employees as this contributes to the financial loss of an organisation. Le, Zheng and Fujimoto (2016: 945) establishes that organisational justice positively affects the well-being of workers through protecting them from corruption, discrimination, victimisation and harassment. The existence if legislation on discrimination, harassment and victimisation seem sufficient, however, regulation needs to be enhanced and punitive measures for non-compliance need redress. If construction companies improve in terms of regulation, the welfare of the workforce can thus be guaranteed. Loosemore, Phua, Dunn and Ozguc (2011: 377) confirm the importance of construction companies being actively involved in the implementation of cultural diversity strategies that have a bearing on discrimination as they contribute to the welfare of workers in a safe, productive, efficient and harmonious way.

3.3.1.3.8 Encouraging local employability schemes and quality work experience for construction trades students

Verhaar and Smulders (1999: 271) asserts that societies must invest in the development of local human capital to cope with prevalent socio-economic and technological changes. Further to this, the employees affirm that training through these local employability schemes is appropriate to grow them into competent workers. Cunniën, Martin-Rodgers and Mortimer (2009: 170, 171) suggest that teenage employment affects self-efficacy development in the economic, family life, community and personal health domain since it provides them with earlier learning from their success and failures in the workplace. They further attest that adequate development of student self-efficacy is greatly achieved through high-quality work experiences. Leslie (1999: 213) advocate for the need to monitor the quality of these work experiences within the different communities as they must transcend known cultural differences. Cunniën, Martin-Rodgers and Mortimer (2009: 172) argue for the need for the

development of smart policies that enhance student's self-efficacy through encouraging youth work experiences within these communities.

3.3.1.3.9 Encourage employee volunteering in the community

Krasnopolskaya (2014: 3,4) reports that organisations must embolden formal rather than informal volunteering in their workers, predominantly due to corporate volunteering being regarded as an instrument for a company to exhibit and deliver sustainable development for the local community. Junior Achievement (2009: 1) reiterates that companies have benefited from these programmes through more productive and satisfied employees and improved standing in the communities in which they operate. Krasnopolskaya (2014: 19) established a positive relationship between corporate volunteering and civic engagement of communities and this relationship permeates into ensuring employees' chances of satisfaction with their health, relations, leisure time, work and employer. Corporate Institute (2014: 2) recognise that volunteer programs are guided by the sensitivity of cultural nuances in different environments and this leads to different metrics on community engagement.

3.3.1.4 Social security of construction workers

ILO (1992: 4) defines social security as “the protection the society provides for its members, through a series of public measures, against the economic and social distress that otherwise would be caused by the stoppage or substantial reduction of earnings resulting from sickness, maternity, employment injury, unemployment, invalidity, old age and death; the provision of medical care; and the provision of subsidies for families with children”. Anker, Chernyshev, Egger, Mehran and Ritter (2003: 165) state that social security is recognised by the ILO constitution and the Social Security Convention 1952, (No. 102) establishes nine classes of benefits: medical care, sickness benefit, unemployment benefit, old-age benefit, employment injury benefit, family benefit, maternity benefit, invalidity benefit and survivor's benefit.

ILO (2018: 46) remark that social security systems are fundamental to perpetually ensure decent living conditions for workers. Ghai, Godfrey, Hepple, Kuruvilla and Saith (2006: 56) widen the focus of social security within the decent work agenda to include; identification of socio-economic vulnerabilities of workers, linking social security and development and combining agendas of poverty reduction, human development and social integration. The prerogative is to respond to societal requirements as set by The Decent work agenda in

Zimbabwe (2015: 23): assisting people to reduce vulnerability to poverty through coping mechanisms, enhancing and maintaining the productivity of workers, enhancing the quality of workers since a healthy workforce can warrant higher productivity.

Therefore, there is need to operationalise social security systems that care for construction workers in Zimbabwe with regards to accessing all the benefits. The Decent work agenda in Zimbabwe (2015: 27) identifies two social protection schemes for workers in Zimbabwe; The National Social Security Authority and Pension and Other benefits scheme. The National Social Security Authority partially caters for construction workers but fails to provide for benefits like unemployment benefits, family benefit, maternity benefit etc. On the other hand, the construction industry has a poorly subscribed pension scheme mostly due to the nature of intermittent employment structures. Failure to adequately cater to construction workers drastically compromises their social protection, destitution and poverty take centre stage. In South Africa, ILO (2010: 8) found that social security is fragmented with inadequate provision of social protection for the economically active population evident. This is exacerbated by the lack of adequate capacity, due to the sole burden of the government, which requires reformation to a more inclusive social security system. Further efforts can be made, for example, Youth employment in North Africa (2017: 3) motivate for the integration of social protection systems with labour market policies to facilitate the integration of the unemployed youths. Sutherland (2017: 2385) also relays that lack of labour market flexibility has led to workers losing employment security, income security and work security.

The social security substantive element is best enhanced by adequate and effective corporate social responsibility strategies. Thus, there is a strong relationship between social security and corporate social responsibility. To augment the shortcomings of the public social systems, private construction firms can implement their own specific social security systems that are propagated through corporate social responsibility strategies that benefit the worker first and consequently their communities.

3.3.1.5 Role of Demographics

Whilst the role of demographics in the study has already been elucidated, the specific role within corporate social responsibility will only be considered hereafter. Lazar, Osoian and Ratiu (2010: 211,212) contend that the perception that work-life policies are primarily developed for women and changing demographics of the population has resulted in a

change towards work-life balance programs. However, Baptiste (2008: 2) argues that the changing demographics composition with an increase in women's participation in construction presents a challenge in work-life balance.

Further to this, challenges due to demographics were noted and alluded to, and remain contentious. Mas-Machuca, Berbegal-Mirabent and Alegre (2016) confirm that work-life conflicts have focused on workers with family responsibilities, resulting in targeted strategies being proffered. Sutherland (2017: 2384) state that negative experiences of employee well-being are borne in females, non-white and untrained individuals. The author further reports on individuals with no qualifications and those that are in jobs that take little time to master as having a positive experience of well-being. Drew and Murtagh (2003: 263) report that work-life balance had a significant gender inference and that contributed to its lack of uptake in organisations.

Strides have also been noted in other environments that have considered and effected corporate social responsibility strategies. Agarwal and Lenka (2015: 357) reiterate that women's need to earn recognition and identity in society must be supported by tangible work-life balance policies. Doherty (2004: 447) report on the positive strides taken towards flexible work arrangements for low-level staff, different employee categories and different gender and the benefits these have enjoyed. However, these positive results are representative of a low minority of companies with the vast majority having no evidence of implementing work-life balance within their organisations.

Angeloni and Borgonovi (2016: 479) proffers a model for sustainable social change based on an intergenerational redistribution of education between younger and older people. Also, the level of education was considered vital for seniors' capability and willingness to play an active role in the workforce through positive retention. These demographic connotations require a deliberate introspection within the Zimbabwean construction industry to unravel any specific inadequacies and differences and inform interventions with regards to age, gender, designation, level of education and experience of the different respondent groups.

3.3.1.6 Gap in the implementation of corporate social responsibility strategies that enhance the social security of workers

Despite the contribution of corporate social responsibility strategies to improving labour productivity by addressing well-being and welfare issues of workers within the communities

they originate, construction companies in Zimbabwe have been excluded due to various reasons. Construction companies have not played any role in the upliftment of the communities they benefit from and serve, by failing to implement sustainable development strategies through addressing the social security of construction workers. Where attempts have been made, philanthropic strategies have taken centre stage and this has indirectly and subtly created a wedge between the companies and workers together with the communities involved. It has led to a lack of commitment from workers originating from these communities and this has translated to workers diminished productivity. Misalignment of goals between the construction companies and the workers is evident. Further to this, the welfare of construction workers has been drastically affected due to apparent neglect by construction companies of workers' fundamental social security aspects that are beyond their on-site obligations.

3.3.2 People-centred management

The Zimbabwean construction industry is fraught with a plethora of challenges that include low productivity (Mhlanga, 2018: 12), project delivery inefficiencies (Kuwaza, 2019: 12) and massive production decline (Mhlanga, 2019: online). Management and manpower-related factors are significant to construction labour productivity in the Zimbabwean construction industry (Chigara and Moyo, 2014: 62). Labour unrest associated with the welfare of construction workers is also pre-dominant within the Zimbabwean construction industry (Mhlanga, 2019: online). Hence, a connection between the productivity of workers and their welfare is potentially existent and cannot be ignored. However, limited research on this determinant, its effect on productivity and welfare of construction workers has been undertaken in Zimbabwe.

Enhancing craft productivity is pertinent for the construction industry (Gong, Borcharding & Caldas, 2011: 737), however, the boundaries in which this can be achieved have evolved through the need for sustainable development. Improving working conditions is a mutual aim of sustainability and lean operations (Piercy & Rich 2015: 288) albeit through effective on-site management. Human resources practices, that encourage social exchange, have the potential of enhancing employees' commitment and consequently, labour productivity and increasing the firm's competitive advantage (Roca-Puig, Beltran-Martin & Segarra-Cipres, 2012: 938) have increasingly become fundamental in the construction industry.

3.3.2.1 Management styles and processes

Dynamic engagement should be operationalised through appropriate management styles to fully harness its validity to encapsulating the sustainability agenda. Griffith and Watson (2004: 28) expose the managerial styles of authoritarian, democratic, laissez-faire and charismatic. However, it is how these styles can further the fundamental sustainability agenda. In cognisance of the reality in terms of the sustainability drive, styles that derive elements from all these may be relevant. These require managers who: give orders which they insist shall be obeyed, never asks people to do things without sketching out the long-term plans on which they are working, allows subordinates to make decisions that affect their workplace and subordinates put great faith in the decisions of the leader (Griffith & Watson, 2004: 29,30). These amalgamated requirements should inspire a new sustainability-conscious style of management that incorporates key processes within their function.

Calvert, Coles and Bailey (1995: 30) provide for a valid overview of seven major processes of building management as outlined by Fayol, Urwick and others. Of these, each process is composed of two elements: human element and technical element dynamics, but to varying degrees. The seventh process is communication, a common denominator of the other six processes, and is essential for good management as every executive or supervisor should consciously and regularly cultivate proficiency in speech and writing (Calvert, Coles & Bailey, 1995: 36, 37). How the processes are characterised by production and people-centred management approaches, though not exhaustive, is as highlighted in Table 3.6.

Production centred management approaches are focused on increasing efficiency, thus the structure and direction of co-workers suits that, whilst people-centred management approaches target people relationships and cooperation within organisations to achieve higher productivity (Anzebgruber, Goetz, Nold & Woelfle, 2017: 22). There are however challenges in achieving the specifics of these management approaches, especially with regards to incorporating sustainability principles, as outlined by the authors hereafter. Smith and Pitt (2011: 147) report that health and wellbeing considerations of the workplace are problematic to measure and are given less devotion. Chan and Kaka (2007: 564) highlight that a strong focus of the manager's influence on labour productivity was the major shortcoming of productivity research as white-collar and blue-collar workers differ on certain factors. However, white-collar workers must harness the views of their blue-collar counterparts if effective strides are to be made in productivity improvements. Collinson Grant (2011: 7) reports that without managerial attention, the workforce can grow faster

than the work it is employed to do hence managers trying to boost productivity find that the problems lie with the workforce.

Table 3.6: Responsibility of management

Processes	Management approaches	
	Production-centred	People-centred
Forecasting	Output standards labour requirements	Interviews, Promotions, Labour policy
Planning	Construction programme, Method statement, Site layout, short term plans, method study	Training schemes, Staff availability
Organising	Job specification, Process chart, site organisation, work measurement	Organisation chart
Motivating	Working conditions, site welfare "Plan for Safety"	Incentives, Company morale
Controlling	Progress record, Quality control	Personnel reports, staff appraisal
Co-ordinating	Site meetings, Productivity committees.	Suggestion boxes, joint consultations

Source: Adapted from Calvert, Coles and Bailey (1995: 38,39)

Thus, the people-centred management approach has been suggested as a suitable alternative due to its advantages of solidifying co-operation, building trust, growing satisfaction and augmenting individual and team performance (Anzebgruber *et al.*, 2017: 23). Kocer (2014: 366) reiterates that the idea of productivity can carry a dangerous seed of self-destruction if it is dissociated from societal concerns and is too mechanical. The author further intimates that productivity initiatives should primarily be embedded in the social fabric of different countries. Gluch and Raisanen (2012: 127) state the existence of a prevalent contradiction between environmental management and project management of construction projects, and thus a reluctance to operationalise it. Several factors influence the performance of project managers, with motivation arguably being the most important, however, socio-economic conditions and cultural backgrounds need to be prudently explored (Jarkas, Radosavljevic & Wuyi, 2014: 1071,1087) before appropriate interventions can be undertaken. Collinson Grant (2011: 16) describe lean thinking is a powerful tool to attaining improvement and sustaining its momentum. The report further asserts that lean tools and techniques have the three main aims of achieving economy, efficiency and effectiveness, albeit achieving relational issues. Thus it addresses waste and wastefulness as an effort of boosting productivity. Managers have to be able to measure and control productivity to be accountable for it (Collinson Grant, 2011: 23). Departure from exclusive concentration on economic and social issues and encapsulation of environmental issues is paramount in this endeavour. In developing countries, productivity initiatives' inclusion of wage moderation may reduce its sustainability, since the wages are already too low (Kocer, 2014: 367). Thus sustainable productivity initiatives must include a social policy pillar to prevent adversity for workers and trade unions and employers' organisations should be involved in its design and implementation. Agyekum-Mensah, Knight and Coffey (2012:

436) weigh in by asserting that effective management of projects through efficient use of human resources will reduce or eliminate delays and cost overruns. They further report that it would lead to responsible management and profitable growth.

3.3.2.2 People-centred management aspects

Whilst production-centred management is still predominant and valid, a deliberate attempt to focus on people-centred management aspects is fundamental as it relates most to a human resource through sustainable practices that ensure adequate treatment of construction workers on construction sites. A plethora of aspects can characterise how workers are managed on construction sites to promote their welfare and concurrently enhance labour productivity. Chigara and Moyo (2014a: 64) recommended construction companies to address factors affecting labour productivity through adequate workforce management. Thus, aspects that can be implemented to enhance the welfare of workers are also deduced from the examination of the factors that affect labour productivity.

Table 3.7: Characteristics of dimensions

Dimension	Characteristic of aspect
Economic	Adequate remuneration, promotion opportunities, up-skilling opportunities, incentive payments
Environmental	Protection and training of workers from and on emissions, effluents and waste
Social	Enhanced impact on human rights, favourable labour practices, sufficient benefits, adequate training and education, adequate health and safety conditions, diversity, promoting equal opportunity, eliminating discrimination, harassment and victimisation, promoting job satisfaction

Adapted from Christofi, Christofi and Sisaye (2012: 165)

However, the distinction of the dimension within which the strategies dominate is difficult. Nevertheless, reference can be made to Table 3.7. Despite this, instances of overlapping are common when considering sustainability dimensions, hence the dimensions within which the aspects are predominant was contextualised. People-centred management aspects entail a wide range of aspects that involve showing concern for the welfare of workers and showing appreciation for their efforts (Casimir and Ng, 2010: 502). These may be implemented holistically or partially but must inevitably lead to support of workers. Tams (2008: 167) relay that for employees to be considered relevant and credible and organisational people-centred perspective is important. Moreso, Hasan, Baroudi, Elmualim and Rameezden (2018: 932) report that the influence of different management approaches is paramount in productivity studies, thus setting a course for such alternative management aspects. Durdyev and Ismail (2016: 455) recommend an improvement on behavioural

competencies of project managers to enhance on-site construction productivity. Therefore, the various aspects, though not conclusive, are reviewed hereafter include: adopt and implement of people-centred values and uphold workers' rights, encourage teamwork, promote continuous improvement, incentivise and encourage involvement of workers, inclusive, accessible and flexible management, reflect best practice and promote diversity.

3.3.2.2.1 People-centred values, principles and uphold workers' rights

Black and La Venture (2017: 24) advocate for the creation of highly productive and highly profitable work environments that exude an organisational culture that is built around employees, management and leadership. In support, Hoogervorst, Koopman and Van der Flier (2005: 94) report that enhanced organisational performance is borne from employees conducting themselves within prescribed structures, rules and tasks. Therefore, the sustainability of organisations or firms is achievable through people-centred management approaches that embed sustainability principles through the adoption of long-term perspectives that support workers, business and communities (Black and La Venture, 2017: 31). Hoogervorst, Koopman and Van der Flier (2005: 103) also find that competent total quality management involves the implementation of people-centred management aspects in the organisation. Further to this, Malaysia and Zairi (1997: 179) proffer a robust perspective on best practice for people management as key in total quality management through; ensuring effective leadership through top management commitment to supporting and appreciating employees' work, ensuring sufficient training and development, involvement, empowerment, teamwork, communication and competent appraisal system for employees and ensuring employees' satisfaction through effective action plans and consequent feedback instruments.

Black and La Venture (2017: 25) further allay that people-centred organisational cultures operate on the precepts that all people are important, on a strong belief in people shaping the organisation, happy people working together perform at higher levels and all people benefit. People-centred values benefit employees through the provision of flexible benefits, effective workforce development practices and empowerment (Black and La Venture, 2017: 27). Toor (2008: 40) strengthens the need for people-centred management concept by reiterating that the human resource remains a very important element in project management. The author further exposes that people-oriented factors have gained incremental focus in project management compared to other aspects. Mullins (2002: 116) confirms the appropriateness of people-centred management policies through insights in the Irish public service as proactively evolving individual skills and strong emotional

commitment. They further argue that practising people-centred management culminates in pleasurable workplaces, enhanced productivity and innovation. Despite the existence of strong advocacy for people-centred management, developing countries like Zimbabwe, still lag in essential decent work objectives that inform such advances (Zimbabwe United Nations Development Assistance Framework, 2010: 15).

Mullins (2002: 124) contend that there is a need to device cross-organisational shift of the beliefs and behaviour of its human resources towards emerging a capacity to entice, stimulate, advance and retain valuable workers. Toor (2008: 40, 41) proposes people management factors that are imperative to effective project management include valuing “uncommon productive thoughts” and encouraging employees to express concerns without fear for reprisal as this potentially leads to improved employee relations.

Black and La Venture (2015: 47) proffer primary drivers to people-centred organisations’ competitive advantage as; profits are invested back into the organisation’s workers, open communication increases productivity and profits, employees are viewed as long-term investments, happy people yield high returns and profit and people must be viewed over the long term. For workers, Mullins (2002: 120) report on expected values as; honesty, integrity, respect for the individual, teamwork, trust and customer focus. Thus, Hoogervorst, Koopman and Van der Flier (2005: 99) contend that a people-centred management approach is based on the leadership viewpoint and thus moral aspects that shape and give meaning to relationships are magnified. Further to this, supports a shift from management towards leadership since it enables the development of “mutuality” where personal and organisational goals concur (Hoogervorst, Koopman and Van der Flier, 2005: 100).

3.3.2.2.2 Encourage teamwork

Certo (2008: 77) supports teamwork in organisations owing to its ability to motivate employees, inspire enthusiasm and encourage responsibility. Teams have the advantage of increasing productivity and commitment from workers (Mathis & Jackson 2011: 120). Thus, employees exposed to teamwork have the advantage of being more productive and delivering high-quality work (Certo 2008: 77). The regressing labour productivity in Zimbabwe, however, potentially reflects an industry that has not unlocked the value of teamwork.

However, Lussier and Hendon (2013: 347) argue that the effectiveness of teamwork is largely based on the quality of on-site leadership on construction sites. Cacioppe (1999:

322) support increased the use of teamwork as it best utilises workforce skills and it shifts from directive, hierarchical leadership structures to participative structures. Teamwork is key to sharing responsibility with workers for continuous improvement (Santos & Powell, 2001: 168). Construction work is best operationalised in gangs, crews and teams; hence teamwork would be fundamental towards advancing sustainable benefits.

3.3.2.2.3 Promote continuous improvement

Mullins (2002: 121) inspire organisations to empower and involve employees by having transparent decision making to all staff and reassuring criticism from all staff regardless of work status. Santos & Powell (2001: 167) opine that continuous improvement activities are successful when the workers that do the actual job are in control, however, the challenge being to establish win-win relationships throughout the entire organisation. More so, in the Zimbabwean construction where local construction companies are struggling due to lack of competitiveness (Chigara & Moyo, 2014a: 57; Mhlanga, 2019: 13). Notwithstanding this, Hoogervorst, Koopman and Van der Flier (2005: 94) acknowledge that efficient production processes are a sum of employees contributing through ideas and knowledge and that organisational success stems from employee centred approaches. Consequently, Bainbridge (2015: 961) recommends refining of job descriptions to reflect people-centred management responsibilities to promote accountability and consequent effectiveness as a way of empowering employees and inclusivity.

3.4.2.2.4 Incentivise workers and encourage the involvement of workers

Janicijevic (2013: 310) concurs by remarking that correcting, transforming and motivating employees' behaviour is most achieved by having a robust reward system. However, a poorly designed and badly implemented reward system is worse than not having such a system at all (Lussier & Hendon 2013: 469). Mathis and Jackson (2011: 359) assert that reward systems are only plausible where the measurement of labour productivity is properly supported. Inadequate labour productivity measurement and monitoring in Zimbabwe (Moyo, Mangore & Chigara, 2013: 42; Chigara & Moyo, 2014a: 57) complicates the implementation of functional reward systems.

However, Santos and Powell (2001: 172) reported that lack of management's commitment to motivation mechanisms contributes to workers taking less responsible with regards to continuous improvement activities. Further to this, poor involvement of workers, lack of knowledge on techniques related to process improvement and analysis hampered any attempts to resolve the problem (Santos & Powell, 2001: 173). Milne (2007: 37) also queried whether incentive programmes do achieve the expected return with regards to the

investment made towards them, and they suggest that informal incentives are more powerful reward strategies as compared to formal incentives strategies, however, both must ensure quality treatment of workers for it to be accepted and effective.

3.3.2.2.5 Inclusive, accessible and flexible management

Feldman, Khademian and Quick (2009: 127) promote inclusive management as a generative approach of knowing public problems and engagement of employees. They further remark that it is dynamic and produces changes in channels for action. This supports the importance of appropriately qualified managers who are adaptable to change, within the Zimbabwean construction industry. However, the existence of inadequate supervisory staff needs to be continuously rectified to achieve the desired objectives (Chigara & Moyo, 2014a: 62). Concerning this, Hoogervorst, Koopman and Van der Flier (2005: 95) assure that increased employee involvement in organisational decisions is fundamental to achieving a total quality approach. Mullins (2002: 122) support the consideration of all involved workers in making appreciated input to what practices should be adjusted or eliminated, albeit in the execution of different tasks.

Durdyev and Ismail (2016: 456) posit flexible management as one of the most significant ways of raising productivity through management. The current production centred management approach in the Zimbabwean construction industry diminishes the implementation of flexible management, despite its apparent advantages. However, the identified need for the implementation of modern project management methods will allow management to rethink their approaches (Mhlanga, 2018: 3). However, flexibility should not be viewed as weakness by workers and thus its implementation must be controlled. Open communication within organisations equip employees through a people-centred culture and contribute towards encouraging commitment, interpersonal relationships, dialogue and persuasion (Black and La Venture, 2017: 27). Open communication is grounded within the social dialogue pillar of decent work, and therefore, must be a norm within every organisation.

3.3.2.2.6 Reflect best practice and promote diversity

Black and La Venture (2017: 26) emphasise that employees' behaviour within the work environment is governed by the operationalised value system. They further reiterate that leaders in people-centred organisations intentionally foster beliefs that employees are important, value diverse opinion and people working together achieve more, and this leads to enhanced productivity, increased profitability and effective engagement (Black and La

Venture, 2017: 27). Wong and Lin (2014: 416) lament the existence of inequality and racial harassment on Honk Kong construction sites and advocate for an inclusive and harmonious workplace through government-led developmental strategies. Loosemore, Phua, Dunn and Ozguc, 2011: 377) lament the failure of managers within the Australian construction industry to prioritise cultural diversity, unconsciously promoting discrimination. The Zimbabwean construction industry has not been spared, with cases of discrimination being reported on construction sites (Mhlanga, 2019: 13). People-centred organisational cultures are flexible and willing to embrace change that affects employees with regards to engagement and self-confidence (Black and La Venture, 2017: 28).

3.3.2.3 Adequate employment treatment

ILO (2013: 141) states that promoting equal opportunities and treatment in employment is key to fulfilling the decent work agenda. Focus is extended beyond gender equality and empowerment to other population groups that include; those that may suffer discrimination, those differentiated by race, ethnicity, migrant workers, rural workers and persons with disabilities. Anker *et al*, (2003: 162) concur that adequate and fair employment treatment is an intrinsic human expectation. As such, discrimination in pay and equal remuneration for work of equal value, work without harassment or exposure to violence, an acceptable degree of autonomy and fair handling of grievances and conflict are pertinent towards achieving fair employment treatment. Ghai *et al*, (2006: 26) emphasise that adequate mechanisms on workplaces should be put in place that deals with harassment and mistreatment.

Achieving adequate employment treatment is borne in the management approach that construction companies utilise on their construction sites. Bouglet and Joffre (2012: 218) also proclaim that the adoption of sustainability practices will likely motivate the workers and increase their commitment. Due to the vast cost and time implications associated with other models, less complicated methods, for developing countries would suffice. These methods should, however, capture all the fundamentals of sustaining labour productivity management within a holistic organisational approach.

3.3.2.4 Role of demographics

Demographics play a key role in ascertaining the effectiveness of people-centred management aspects on construction sites. The variability of workers' requirements is

borne in their demographic profile as highlighted hereafter. Data collected from construction workers and managers revealed that whilst there was lack of implementation of best production management practices by managers, there was also a general lack of participation in improvement activities by workers (Salford & Powell, 2001: 170). Milne (2007: 28-29) recognises the difference in appreciation for financial rewards and advancement between workers and managers through the scepticism on sharing knowledge on the workers' part and the managers incentivising its sharing. Ganta (2014: 229) also recognises the incentivising workers has been a central problem for managers emanating from a need to grasp the concepts of organisational behaviour and psychology and differences in individual needs. Kim (2006: 34) reiterates the existence of false preconceived notions that motivational factors are the same for managers and employees and confirms the vast differences.

Eliufoo (2007: 119) acknowledges manifestation of gendered divisions on construction sites through women being relegated to subordinate positions, performing less technical skills and receiving unequal remuneration. Further to this, they have less flexible working hours and are disadvantaged due to reproductive responsibilities. Burgess and Connell (2015: 803) concluded that workplace vulnerability is dependent on gender, level of skill, age and ethnic status and intervention methods are reliant on these demographic stratifications.

Due to these demographic inadequacies, it is prudent that it be considered within the study to enable targeted short- and long-term interventions that are holistic. This ensures a robust integration of sustainability dimensions through the people-centred aspects for all workers.

3.3.2.5 Gap in people-centred management aspects that can enhance adequate employment treatment of workers

The current approach to on-site management of labour productivity that treats workers as commodities has been detrimental to the productivity drive. Further to this, the profitability determination has contributed to the human resource being the least catered for. In an economy that focuses on labour-intensive construction, it is paramount that a people-centred management approach to labour productivity is implemented with a purpose to provide adequate treatment of construction workers on construction sites. This initiative is however not simple to achieve as there is a need to incorporate sustainability dimensions within it. Thus the Zimbabwean construction industry provides a momentous challenge in proffering people-centred management aspects that construction companies can inculcate

within their organisations, are sustainable and that ultimately lead to adequate employment treatment.

3.3.3 Sustainability literacy in the training of construction workers

Developing countries have lagged in the attainment of labour productivity efficiency in comparison to their developed counterparts (Kazaz & Ulubeyli, 2007: 2133). Globalisation has further increased this gap as indigenous companies from developing countries have failed to compete and hence have been marginalised (Moyo, Mangore & Chigara, 2014: 43). Achievement of sustainable development is entrenched in equipping professionals and skilled individuals in its literacy (Murray & Cotgrave, 2007: 13). Training of workers has been the most consistent recommendation for addressing the need for creating a safe working environment in Zimbabwe (Taderera, 2012: 115; Chigara & Moyo, 2014b: 156; Charizeni & Chagonda, 2018: 19).

Opoku and Egbu (2017: 1) define “Education for Sustainable development” as being used to describe sustainability learning as equipping graduates to take responsibility for creating a sustainable society. Durdyev and Ismail (2016: 456) report that lack of an appropriately skilled workforce is the riskiest constraint to on-site productivity. Further to this, Zimbabwe’s developmental needs are insufficiently matched by the educational curriculum (Zim-Asset, 2013: 22). A curriculum, which does not fully support sustainable skills development from early childhood to vocational and tertiary levels, is detrimental to the efficiency of the construction industry. Zimbabwe Report on the Presidential Commission of Enquiry into Education and Training (Nzirasanga Commission) (1999: 433)’s recommendation of a new education structure in Zimbabwe that introduces vocational education at basic education level, hence laying a strong foundation for post-basic education, is still to be operationalised. A dire need to realign the nation to the dignity of labour was and is still sought in the pursuit of enhanced competitiveness.

Though construction should enhance social, economic and environmental sustainability, there is a need to motivate for a considerable level of sustainability literacy (Murray & Cotgrave, 2007:9). Khan, Kiani, Ashraf and Iftikhar-ul-Husnain (2010: 473) reiterate that education is decisive to advance and sustain productivity. Nzirasanga Commission (1999: 418) elucidates that entire technical and vocational training scheme in Zimbabwe is so formalised and obstinate that it does not accommodate varying training requirements of

the industry with Cotgrave and Kokkarinen (2010: 268) adding that this also includes developing environmental knowledge, skill and understanding.

3.3.3.1 Technical and vocational training

ILO (2011: 5) reiterates that countries share the challenge of ensuring that learning is effective, sustained and relevant to the world of work. Regrettably, Government of Zimbabwe (2014: 30) reports that technical and vocational training institutions have remained ineffective in developing manpower to contribute to the sustainable growth of industries. Hence, a broad range of institutional reform is thus required and this includes curriculum reform to suit new products and services. There is a consistent gap between the kind of knowledge and skills that are most in-demand in the workplace and those that training systems provide (ILO, 2011: 5). Further to that, assessing the relevance and quality of training institutions, and programmes, relative to their cost, remains a challenge. Sustainable literacy training is thus fundamental in abating this anomaly.

This deficiency is alluded to by the different authors hereafter. Phuthi and Maphosa (2007: 2) echo that evolving socio-economic needs and the industrial complexion of the country are influenced by relevant education and appropriate human capacity to sustain it. ILO (2011: 2) asserts that to keep training relevant, institutional and financial arrangements must bridge the world of learning and the world of work through bringing business, labour, government and training providers together. This is an effective strategy of maintaining training relevance despite the changing needs of labour markets and societies. Forum for the Future (2004: 17) conveys that the most effective principle of achieving sustainable literacy is through incorporating it into the content and delivery in all disciplines. Training programs should be arranged to accomplish organisational tasks and enhance employee performance and this is achieved by the effective transference of skills (Bhatti & Kaur, 2010: 656). However, Crawford and Vogl (2006: 212) recognise that there is also the risk of failure to accurately capture the acquisition of skills by the workforce.

The vocational training curricula are key to achieving sustainable labour productivity. For such a curriculum to be relevant, consultations with all stakeholders will ascertain the unique requirements within the local environment. This should, however, be operationalised by changing the thought process and perceptions of the workforce to achieve sustainable development (Brennan & Cotgrave, 2014: 323).

3.3.3.1.1 Training needs for adequate productive work of construction skilled workers

Promoting adequate productive work is vital to the decent work agenda (ILO, 2013: 65). Anker *et al.*, (2003: 157) expose the ability of workers to improve their work and income in the future through training and education, therefore, participation in job-related training provided by employers provides an indicator for future earnings. Technical and vocationally trained construction workers already possess the fundamental training especially concerning their technical skills, however, the advent of the sustainability drive and Decent Work Agenda requires an additional understanding of sustainability learning objectives to ensure the workers remain adequately productive.

3.3.3.2 Training of semi-skilled construction workers

Skills developments have been affected by the lack of implementation of policies that support the continuous generation and evolution of skills. Investment in workplace training allows employees to systematically develop and upgrade their skills which is essential for the enduring and sustainable success of any construction company (Detsimas, Coffey, Sadiqi & Li, 2016: 486). In Zimbabwe, due to largely subdued construction industry, skilled personnel have and continue to migrate to other countries within the region and abroad (Chetsanga, 2003: 1; Mhlanga, 2018: 12) and this has the potential of negatively impacting the quality of on-site skilling personnel.

Government of Zimbabwe (2014: 21) states the prerogative of the government being provision of relevant skills to individuals for sustainable economic development and self-fulfilment through a system which is accessible, equitable, inclusive, financially sustainable, and responsive to technological developments, includes entrepreneurship and involves all stakeholders. The policy framework is comprehensive in that it covers formal, non-formal and informal skills development conducted by public and private institutions, the informal sector and enterprises. Ogbeifun (2011: 83) relays that the common practice in the twenty-first century, especially in the informal sector, is an abridged form of 'on-site' training of artisans through the duration, intensity and mode of operation are not standardised. Hence, Phuthi and Maphosa (2007: 2,3) clarify that the apparent gap between what formal programmes offer and what the industry requires has led to the industry devising its staff training options for certain skills.

ILO (2011: 2) report that a good skills development system should anticipate skills needs, maintain the quality and relevance of training and continuously evaluate the economic and social outcomes of training. Also, evaluation of the environmental outcomes of training needs attention especially with regards to the sustainability goal. Various authors have attempted to unravel the skills challenges as outlined hereafter. Chigara and Moyo (2014a: 57) identified the lack of workforce skills and labour experience as part of the top 10 factors that affect labour productivity in Zimbabwe. This lack is however silent on the sufficiency of sustainability concerns by the workforce. The need for every industry to maintain and improve skills by continuous training of generations of skilled workers cannot be overemphasised (Sparks, Imgram & Phillips, 2009: 190). Within the region, the quality of craft skills in Sub-Saharan Africa has been reported to be low, with Zambia's construction industry having revealed dissatisfaction with craft skills from training providers (Muya, Price & Edum-Fotwe, 2006: 239). In Tanzania, the quality of skills performance was unsatisfactory as construction projects continued to depict poor workmanship (Kikwasi, 2011: 135).

Invariably, the craftsmen's training backgrounds and level of competence are rarely established before engagement and this largely contributes to the low-quality performance (Kikwasi, 2011: 135). However, since on-the-job training has become the most utilised form of skills development opposed to formal vocational training institutions in Zambia (Muya, Price & Edum-Fotwe, 2006: 239) and more-so, arguably within the Zimbabwean construction industry, much more effort is required to structure it adequately. Added to this, the construction industry requires a broad-based set of skills that craft workers cannot acquire through full time learning alone hence skill formation should combine on-the-job work experience with formal classroom learning (Woods, 2012: 402). Bhatti and Kaur (2010: 657) focused on factors that affect the transfer of training to the workplace as key in maximising its benefits. The ability to attain higher productivity increases by the acquisition of complementary knowledge (Woods, 2012: 403). Ultimately there is a huge opportunity to drive labour productivity through on-the-job training. ILO (2011: 18) state that international experience shows that countries have succeeded in linking skills development to improvement in productivity, employment and development.

3.3.3.2.1 Safe working environment

This broad indicator covers the extent to which workers are protected from work-related hazards and risks (ILO, 2013: 154). This emanates from occupational safety and health at work being one of the most dynamic components of the decent work agenda. Ghai *et al.*, (2006: 28) urge that fostering conditions that preserve and promote workers' physical and emotional well-being as this is in the interest of workers. Anker *et al.*, (2003: 164) also assert that safety and health at work are fundamental in promoting workers' physical and psychological integrity. ILO (2013: 154) suggests statistical and legal framework indicators that are utilised to assess and monitor this broad indicator, however, the root causes of lack of adequate training in safe work are not expounded. Teo, Ling and Ong (2005: 420) confirm that safety training courses are proactive and fundamental to increasing awareness of dangers and ultimately fostering safe work behaviour. De Silva and Wimalaratne (2012: 387) reiterate that adequate occupational health and safety education and training will produce skilled and self-disciplined personnel and establish the sought after safety culture on construction sites.

Whilst, technical and vocational education training inculcates some semblance of mandatory training on safe working environments within their curricula (Teo, Ling and Ong, 2005: 420), contrariwise, the lack of structure in on-the-job training of semi-skilled workers in Zimbabwe make it circumspect to producing workers that are safety conscious. Chaturvedi, Thakkar and Shankar (2018: 350) support training programs that leverage construction workers' skills and safety awareness. Hence, the thrust of the inclusion of this broad indicator is the propagation of instruction in sustainability learning objectives especially to the training of construction semi-skilled workers whose training manuals are bereft of such fundamental training.

3.3.3.3 Sustainability learning objectives

The prerogative of the Decent Work Agenda, Sustainable Development, and Green Economy is to establish green jobs through skills transformation and this is supported by the ILO through the promotion of a just transition towards environmentally sustainable economies and societies for all (ILO, 2018c: 53). ILO (2018c: 130) also recognises that adequate skills are key to advancing decent work and transition to a green economy, however, the inclusion of such skills in both formal and informal technical and vocational training is still in its early stages in the majority of countries. Gu, Gomes and Brizuela (2011:

11) offer challenges towards integrating sustainable development in technical and vocational education and training and on-the-job training as including misunderstanding of Education for Sustainability (ESD)

Despite the veracity of this challenge, UNESCO (2014: 25) outlines one of its guiding principles as “Education is a foundation for human fulfilment, peace, sustainable development, economic growth, decent work, gender equality and responsible global citizenship”. Further to this, one of its 2030 targets is “to ensure all learners acquire knowledge, skills, values and attitudes to establish sustainable and peaceful societies, through global citizenship education and education for sustainable development”. UNESCO (2012: online) presents sustainable development topics that countries have purposed to address as reducing poverty, changing consumption patterns, global population health, protecting human health, climate change, equity and loss of biodiversity. Gu, Gomes and Brizuela (2011: 5) presents the importance of ESD as an approach that provides theoretical information and practical tools to usher society towards sustainability.

This endeavour requires an elaborate restructuring of training curricula at the national level to address environmental, social and economic contexts to ensure situational relevance and cultural congruence (UNESCO, 2012: online). Achieving this requires selecting appropriate knowledge, issues, skills, values and perspectives within the contexts, as shown in Table 3.10. UNESCO (2014: 37) bemoan lack of sustainable literacy skills because of poor quality education systems that are not context-specific and context-relevant.

To counter these challenges, UNESCO (2014: 47, 48) advocates for strengthening ESD through implementing substantial changes in training which entail incorporating critical issues such as climate change, biodiversity, disaster risk reduction and sustainable consumption and production. Added to this, support for health and well-being education for learners is pertinent for inclusive, sustainable and rights-based development. UNESCO (2017: 10) remarks that ESD can develop learning objectives that are specific to a particular sustainability development goal (SDG) and relevant to all 17 sustainability development goals. Due to the plethora of learning objectives across all 17 SDGs, relevant learning objectives were selected, and these were predominantly within the Good health and Well-being, Decent Work and Economic Growth. These are related to the decent work substantive indicators of adequate earning and productive work and safe work environment for technical and vocational trained and on-the-job trained construction skilled and semi-skilled workers.

Blewitt (2010: 480) justifies the lack of mainstreaming of sustainability within the training curriculum as due to suspicion that the concept is inexact, unique to different situations and the general lack of knowledge. Viertel (2010: 218) bemoans arguments on widespread inequalities, environmental damage, climate change and dwindling resources and the consequent need for stronger vocational education on sustainable development. Cruickshank and Fenner (2012: 251) acknowledge that modern societies increasingly need intricate socio-technical systems to deliver adequate and compliant products and services.

Kronner (2005: 6, 7) identified key areas of vocational work, as only related to construction work, relevant to environmental and social dimensions of sustainable development as stated in Table 3.8. The absence of the economic dimension is due to existing vocational training activities predominantly focusing on it. Blewitt (2010: 482) supports this assertion by reporting that technical and vocational training centres have focused on supplying skilled labour that boosts productivity and facilitates economic growth, however, ignoring environmental and social consequences.

Table 3.8: Learning objectives within sustainability dimensions

Dimension	Learning objectives
Environmental dimension	<ul style="list-style-type: none"> • Management of water resources • Use of renewable energies to ensure a continuous supply • Impacts on the soil of erosion and desertification • Recycling to reduce the exploitation of natural resources • Waste management for the conservation of the environment
Human and Social dimension	<ul style="list-style-type: none"> • Safety and health at work • Health standards for the prevention of pandemics • Teamwork in multicultural environments • Ethical standards application in interactions
Environmental and social dimensions	<ul style="list-style-type: none"> • Preservation and culture of maintenance • Use of traditional and indigenous technologies • Noise emissions control

Source: Adapted from Kronner (2005: 6, 7)

Kronner (2005: 9) further intimates that vocational training should tap into The Global compact on issues relating to sustainable development whose ten principles require companies to embrace, support and enact core values. The sustainability learning objectives as proposed by UNESCO (2017: 6, 16, 18, 22, 24, 26, 30, 34, 36, 40, 42) and Kronner (2005: 6,7) are expanded hereafter and form the basis of the review.

3.3.3.3.1 Training in physical and mental health well-being

The need for construction workers to maintain good health and well-being on construction sites and within their communities cannot be overemphasised. Ricci, Chiesi, Bisio, Panari and Pelosi (2016: 356) emphasise that organisations have the prerogative of training

workers on job conditions that allow real self-realisation and support continuous improvement of occupational health and well-being. They further support additional training by highly qualified instructors beyond the compulsory training required by law. Freitas, Silva and Santos (2017: 791) concur that good health and well-being of workers can only be ascertained when the interventions by professionals are further propagated by in-house safety trainers that continually transfer the training to the workplace. A holistic safety approach that includes operant conditioning techniques, training in safe work practices and safety awareness campaigns is critical to enhancing the well-being of construction workers (Teo, Ling & Ong 2005: 414). Ahasan and Imbeau (2003: 123) also support education and training on ergonomics to allow construction workers to fully benefit through protection from work-related disorders.

3.3.3.3.2 Education as a driver of sustainable education

Quality sustainable education is now more pertinent than ever. ILO (2018b: 4) attest that skills development programmes that are aligned to and facilitate a transition to a green economy are yet to be established. Kronner (2005: 1) also report that contextualisation, application, judgement, and decision-making are vital for embedding sustainable development within our professional working activities, and these can only be achieved through quality sustainable education. Viertel (2010: 223) concur that competent transition to achieving sustainability is vital and can be realised through general awareness, applied research, technological innovation and provision of advice and assistance to companies. They further proffer key competences of environmental awareness and knowledge, technical and business knowledge and skills as being fundamental for vocational training for achieving sustainable development. ILO (2011: 27) emphasise that great effort is required to ensure skills training systems deliver quality training through an adequate supply of qualified training staff.

3.3.3.3.3 Training in the conservation of water and consumption of resources

The construction industry has an immediate need to ensure availability and sustainable management of water and sanitation for construction workers and other associated stakeholders. Sfakianski (2015: 233) advances attributes of a resource-efficient construction industry that encompasses advocating for the best use of water resources that minimise operationally and embodied impacts. However, to improve this efficiency, key players like construction workers need to be trained on drivers and of this sustainability objective (Sfakianski, 2015: 239). Comaru and Werna (2013: 9) bemoan exposure of workers to unsafe water and poor sanitation leading to ill-health. With adequate instruction,

workers will be empowered to seek redress and protect themselves from calamitous situations.

Learning objectives that deal with responsible consumption and production that ensure sustainable consumption and production patterns are also essential. Viertel (2010: 222) relays that sustainability problems must be avoided by eliminating wasteful production and consumption patterns in inculcating efficiency and equity aspects. Cruickshank and Fenner (2012: 251) further relays that training towards effective management of diminishing stock of natural resources is fundamental the world over. ILO (2018c: 17) argues that jobs in most sectors, including the construction industry, are threatened by the increasing scarcity of natural resources and a continued decent work deficit. This potentially will have a disastrous effect through deforestation and environmental degradation unless workers are appropriately trained to counter these challenges through sustainability literacy.

3.3.3.3.4 Training on energy efficiency and sufficiency

Instruction on the importance of affordable and clean energy through ensuring access to affordable, reliable, sustainable and clean energy for the construction industry is paramount. ILO (2011: 13) recognises that skills development is essential for the transition to cleaner energy through maximising new job opportunities and addressing problems associated with possible job losses. The characteristic of low-income countries of high energy costs strongly encourages innovations that can reduce the pressure on the GDP, and achieving this is dependent on appropriate sustainability learning instruction.

3.3.3.3.5 Training on decent work, inequality and rights of workers

Decent work and economic growth through promotion of sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all are pertinent. ILO (2011: 13) allude to the construction as one of the sectors that require urgent training in the full complement of skills towards achieving “greening” of jobs, which has become an emblem of sustainable development. March (2009: 116) supports the prioritising of the training needs of workers and cyclic training plans that are sensitive to any changes in the quantity and quality of the workforce. Further to this, feedback systems on training efficacy from both white-collar and blue-collar workers is pertinent. ILO (2018b:2) reiterate that transition to a green economy is essential for improvements in decent work. Therefore, a workforce that is knowledgeable on decent work and its benefits can contribute sufficiently and effectively to its achievement.

Inequalities within the construction industry that affects various worker groups like migrants and is gender insensitive, need not only to be reduced but eliminated. Wage discrimination and gender bias reveal a poor understanding of decent work and consequently, the governing authorities need to increase skills and protect their rights and interests (Adhikari *et al.*, 2011: 75). ILO (2018c: 28) report that decent work deficits lead to jobs that contribute to violating the principle of equal opportunity through encouraging increased utilisation of vulnerable workers like migrant workers within the construction industry.

3.3.3.3.6 Training on climate change

Whilst urgent action to combat climate change and its impact are required, fundamental aspects of achieving and maintaining a consensus with the construction industry are imperative. UNICEF (2012: 5) confirms the need to adjust existing training approaches so that learners are provided with the necessary knowledge to react to the climate change phenomenon. ILO (2018b: 2) report on the adverse effects of climate change that include a negative impact on Gross Domestic Product growth, employment and inequality and the need for appropriate policies that address this phenomenon. Such policies should also include equipping workers with essential knowledge on strategies to counter the effects of this phenomenon. Cruickshank and Fenner (2012: 251) supports instruction in climate change as pertinent for transforming current working conditions regime. Whilst ILO (2018c: 23) bemoan perpetual productivity losses into the future due to the increased impact of natural hazards on the world of work, if climate change and its effects are not restricted, Balliester and Elshaikhi (2018: 1) consider climate change as one of the key megatrends, projected to play a major role, within the future of work.

3.3.3.3.7 Training on sustainable practices and ecology

The protection, restoration and promotion of sustainable use of terrestrial ecosystems, sustainably managing forests, combating desertification, and halting and reversing land degradation and biodiversity loss is vital within the sustainability development to construct. Tilt (2001: 190) exposes that a company's philosophy on environmental policies reflects on the content and disclosure of these aspects to external stakeholders. Bolder regulations on these aspects would translate to intensive training of internal stakeholders to enhance the content of its reporting. Karapetrovic and Willborn (1998: 210) report that one of the key drivers of an environmental management system is training, awareness and competence. Cotgrave and Kokkarinen (2010: 268) also concedes that training is key to ensuring the generational transition to achieving environmental awareness. Blewitt (2010: 482) reiterates that technical and vocational training needs to align with the changing needs in a working

world that is uncertain, interconnected and ecologically precarious. Inevitably, increased pressures on the environment require exploration on technical detail (Cruickshank & Fenner, 2012: 251) and Piercy and Rich (2015: 295) agree that a positive and engaged workforce is a result of effective training and up-skilling on environmental and quality aspects within the industry. However, ILO (2018c: 17) warns that if these training concessions are not made, future jobs will be affected because of them being directly or indirectly linked to the ecosystems.

3.3.3.3.8 Training on social and economic justice

The promotion of peaceful and inclusive societies for sustainable development, provision of access to justice for all and building effective, accountable and inclusive institutions within the construction industry augers well with ever-present sustainability anxieties within this sector. Whilst MacNaughton and Frey (2011: 448) state that one of the primary purposes of the ILO is to promote social justice, Victor (2006: 99) propagates the assertion that sustainability development promotes international harmony, however, the dissonance between global ambitions and local realities explains why little has been achieved. Priest (2008: 3) proffers the social capital concept comprising networks, shared values and understandings that enable groups and individuals to trust each other and work together. The author further encourages technical and vocational and on-the-job training that avails opportunities to trainees to interact and work collaboratively.

Viertel (2010: 222) report that strong institutions are fundamental, even within the construction industry, and should be characterised by adequate political commitment and effective governance structures and policies. Victor (2006: 91) reiterates that maintaining justice ensures that natural resources are well managed and this can be achieved through promoting freedom of opportunity within the construction industry. An environmentally sustainable economy certainly guarantees limited negative environmental externalities thereby promoting social justice (ILO, 2018c: 28).

3.3.3.4 Role of demographics

Training is a determinant that is synonymous with demographics. The continuous changes in curricula and uncertainties of on-the-job training reflect a diverse workforce in terms of literacy content. Therefore, failure to include demographic variables within these considerations would be damaging to the validity of the study. These anxieties are expanded on by the authors hereafter. Eliufoo (2007: 119) highlights demographic anomalies that consist of female construction having low levels of education and training when compared to their male counterparts and consequently earning less remuneration.

Alkhaddar, Wooder, Setyesilisik and Tunstall (2012:130) expose the deep learning approach effectiveness on sustainability improvement differences between office-based and site-based construction workers whose characteristics are predominantly white collar and blue collar respectively. ILO (2018c: 17) report that the risks and hazards associated with environmental degradation affect women and the vulnerable workers the most thereby ensuring perpetual inequality.

Despite Dainty, Ison and Briscoe (2005: 392) unravel an important deficiency in physical stamina of older trades' workers, superior skills of this older generation are greatly emphasised. Giles and Campbell (2003: 99) also bemoan the apparent skills gap between the younger and older generation of skilled workers. Added to this, Colombo and Stanca (2014: 1151) proffer that training has a significant effect on the construction of skilled workers' productivity as compared to a non-significant effect for white-collar workers within construction organisations. Skinner, Saunders and Beresford (2004: 191) contrast the effect of work experience on perceptions of training needs amongst employees where the focus is placed on different skill sets with a consequential mismatch between parties to an employment relationship.

Robotham (2003: 479) interprets the importance of the level of education by highlighting that effective training to achieve competent learners is borne out of consideration of their learning ability. Tai (2006: 62) also present the different requirements for managers and employees related to enhancing the effectiveness of training outcomes through modelling trainees' attitudes. While managers are responsible for clearly outlining the importance of training and the associated technical support, employees buy-in through believing in their ability to learn and willingness to gain knowledge.

3.3.3.5 Gap in the training of sustainability learning objectives for construction skilled workers

Sustainability dimensions must be wholly considered and all the fundamental aspects included in the training curricula. Further to this, the delivery of the training has to be interrogated to ascertain its sufficiency in achieving this objective. Thus, it is envisaged that this examination will ascertain sustainability learning objectives that will deliver the required substantive elements.

3.3.3.6 Gap in the training of semi-skilled construction workers

It is imperative that a standardised or structured on-site skills development that incorporates fundamental sustainability learning objectives be proffered that integrate sustainability dimensions and especially address the safe work environment substantive element.

3.3.4 Provision of decent working conditions

According to Mhlanga (2017: 3), productivity, profitability, performance and sustainability challenges within the Zimbabwean construction industry are inevitably affecting workers. Worker issues require a focus on human resource management. A focus on human resources is pertinent for achieving any meaningful advances. Indeed, the workforce is the most important asset in the labour-intensive construction industry (Jang *et al.*, 2011: 93). Therefore, contractors need to improve the conditions in which people work in the industry. Construction labour productivity challenges are ever-present in the Zimbabwean construction industry, and the current national drive towards achieving decency of work presents a need for a convergent resolution. Though the national prerogative is "...to promote and secure sustainable, full, productive and freely chosen decent employment for all the conditions of freedom, equity, security and human dignity" (Government of Zimbabwe, 2014: 25), lack of adequate health and safety requirements (Chigara & Moyo, 2014b: 157), lack of on-site facilities and non-compliance with statutory regulatory authorities (Chigara & Moyo, 2014a: 62) have continued to affect construction workers.

Working conditions should be operationalised given social, economic and environmental concerns that prolong future predictions, especially from the construction labour perspective. Hasan, Baroudi, Elmualim and Rameezden (2018: 932) confirm that a gap exists in research on factors that affect productivity in sustainable construction projects. Durdjev and Ismail (2016: 456) posit the provision and control of convenient working conditions as one of the most significant ways of raising productivity through management. From the studies, it is apparent that the key to achieving the welfare of construction labour productivity is in ensuring optimum working conditions. Therefore, this study focuses on the working conditions within which productivity measurement is also undertaken with the motivation that these conditions would be transferred to day to day on-site activities. These working conditions have been elucidated through the Decent Work Agenda as those augmenting sustainable development (ILO, 2018: 15) and described as decent working conditions.

3.3.4.1 Decent working conditions

Despite Stamerra (2016: 515) acknowledging that decent working conditions are those aspects of work that are directed towards the human aspect of work, are dignified and

satisfactory to the worker, ILO (2018e: 15) states that construction sites in developing economies are characterised by the most precarious working conditions that include unsafe practices and unfair workloads for workers. Factors of poor workmanship, absenteeism and lateness, and accidents and occupational hazards must be eliminated in the work process (Chigara & Moyo, 2014a: 62) through the provision of adequate on-site conditions and assurance of realistic set standard outputs. This translates to proper management and personnel policy for creating a satisfying work environment, development of appropriate training for skills and creation of better working conditions.

However, Khan and Sandhu (2016: 491) assert that there is the unavailability of the extensive literature on decent work practices due to its recent introduction in the International Labour Conference in 1999, and this is a hindrance within this objective. The Zimbabwe Government (2013: 279) has considered key working conditions within its statutory framework, however, it is the translation of these conditions within the productivity measurement scope that is lacklustre. The statutory instrument fails to contribute towards a standardised framework for undertaking productivity measurement at NEC level and construction company level, through its failure to specify required decent working conditions, thus a lot is left for private interpretation.

Potentially, the provision of specific decent working conditions, even in the generation of outputs, will ensure that there are no disparities between the set and actual standards. Further to this, as these decent working conditions are established, sustainability dimensions will be essentially incorporated into productivity measurement. Ghai (2003: 122) suggest decent working conditions be dominated by occupational safety and health and include, working time and working environments. ILO (2018: 15) and ILO (2018b: 3, 4) also proffers several working conditions that need intensive attention within the decent work discourse, and these include health and safety, working time, remuneration and social protection. Hartrich (2018: 2) also highlight challenges of high-risk, physically demanding, personal safety concerns, operating heat-intensive machinery, for construction workers in Rwanda, Zambia and Mozambique. ILO (2018b: 32) remark that recommendations on sustainability concerns and needs of workers included social dialogue, social protection and occupational health and safety. Therefore, conditions of; occupational health and safety organisation, ergonomics, personal protective equipment, climatic conditions, working time, work premises and welfare facilities will be considered within this objective, as they relate to the human aspect of work, are dignified and satisfactory to the worker.

3.3.4.1.1 Occupational safety and health organisation

ILO (2018e, 20) states that occupational health and safety is an inherent risk on construction sites in developing countries where a preventative safety culture is extremely rare. However, ILO (1992: 36) argues that occupational safety and health organisation (OSH) is essential and the most effective methods are;

- to recognise the importance of the employer's responsibilities for ensuring that the workplace is safe and without risk to workers' health
- to adopt occupational safety and health policy that provides for the establishment of a good occupational safety and health organisation within the enterprise; and
- to encourage strong participation of workers in safety and health activities at the workplace: including safety committees, inspection and accident investigation, and the appointment of specialists.

Within these methods, emphasis must be directed towards the planning phase in the generation of output standards. Nunez and Villanueva (2011: 56, 66) highlight the lack of consideration of occupational safety and health activities within the sources of the intellectual capital of a company and they indicate the need for companies to invest in safety intellectual capital within their human capital. This has inevitably exacerbated the implementation burden of OSH on construction sites (Chigara & Moyo, 2014b: 155). Though legislation and compliance have also been set to address OSH challenges on construction sites, the challenges persist (Sherratt & Sherratt, 2017: 389). This is partly owing to contractors' resisting modern OHS legislation (Wadick: 2010: 108) and also to the fragmented nature of the industry (Emuze & Smallwood, 2014: 294). However, the goal is to effectively plan and implement adequate OSH organization on construction sites that not only reduces injuries on sites but also enhances productivity and improves worker morale (Reese, 2016: 125).

Hare and Cameron (2012: 193) reiterate that the effective management of firms must embrace OSH management as an integrated process and deliver construction projects that do not satisfy some objectives at the expense of others. In support of this, De Silva and Wimalaratne (2012: 387) associate challenges in improving performance in the Sri Lankan construction industry regarding accountable parties disregarding OSH culture. OSH must be a shared duty among the stakeholders. However, Oswald, Sherratt and Smith (2017: 370) suggest the implementation of reward systems as a strategy to encourage safe

behaviour on sites. This has cumulative benefits as confirmed by Chaturvedi, Thakkar and Shankar (2018: 350) when they reported that safety gains on construction sites improve workers' performance and advised on the introduction of a system that rewards positive safety performance. Mosly (2016: 229) recommends the integration of safety and health into sustainable construction for the attainment of cost efficiencies and inevitably enhance productivity on construction projects.

3.3.4.1.2 Ergonomics

Rowan and Wright (1994: 7) established that ergonomics is paramount by having a positive influence and effect on performance enhancement, productivity improvement, quality improvement and a company's profitability. Fernandez (1995: 20) adequately defines ergonomics as "the design of the workplace, equipment, machine, tool, product, environment, and system, taking into consideration the human's physical, physiological, biomechanical, and psychological capabilities, and optimising the effectiveness and productivity of work systems while assuring the safety, health and well-being of the workers". Congruently, Rowan and Wright (1994: 7) relate to ergonomics as a system of interacting components which includes the worker, both the physical and organisational work environment, the task and the workspace. Further to this, they report that its goal is to maximise worker' safety, productivity, and comfort through ensuring a good fit between workers and their tasks.

Whilst ergonomics is synonymous with OSH, the lack of awareness of ergonomics on construction sites because of inadequate enforcement (Adnan & Ressang, 2016: 190) contributes to its being considered separately. Furthermore, traditional health promotion, which is synonymous with ergonomics, and which maximises health, well-being and productivity in the workplace, has been addressed separately from OSH (Obiozo & Smallwood, 2014: 139). Ahasan and Imbeau (2003: 73) highlight the existence of traditional social attitudes and work values that are potentially affected by the employer-employee relationship and whose resistance can lead to reduced productivity. Adnan and Ressang (2016: 190) expose the challenge of implementation of ergonomics on construction sites owing to its dynamism and hazardous nature. Eaves, Gyi and Gibb (2013: 101) also acknowledge that ergonomics and workplace design can have a substantial effect on working practices. Goldswain and Smallwood (2013: 359) also mention health, safety and ergonomics being caused by inadequacies in designs. Also, Coupand (2017: 93) deplores the emergence of musculoskeletal and psychosomatic disorders in industrialized countries as new risks for workers. However, Obiozo and Smallwood (2014: 146) support the

greening of construction sites as a strategy to enhance ergonomics and performance on those same sites. Chinyere (2014: 78) also supports the adoption of optimal work postures for greater job satisfaction. Neumann, Winkel, Medbo, Magneberg and Mathiassen (2006:904) also expose that productivity gains through enhanced systems designs do not necessarily lead to improved ergonomics, hence prudence must always be observed. As such, proactive ergonomics is best emphasized during the generation of productivity outputs and method study, as this then sets a standard working procedure for the specific activities.

3.3.4.1.3 Personal Protective Equipment

The Government of Zimbabwe (2013: 280) in Zimbabwe details the personal protective equipment (PPE) that employers must provide. The ILO (2018e: 20) laments the provision of PPE as merely a box-ticking exercise that is not effective in protecting workers against construction site accidents. Lack of adequate protection for workers is one of the significant conditions that have led to fatalities and near-fatalities in the South African construction industry (Emuze, 2017: 330). Akawi, Musonda and Pretorius (2017: 478) attribute these challenges to pricing shortcomings emanating from the competition and the lack of detail in the consideration of health and safety aspects such as personal protective equipment.

Taderera (2012: 99) outlines the importance of competent hazard prevention through prevention and control measures assessment, the goal of which is to specify adequate and relevant PPE. Implementation of a job hazard analysis will also aid in determining task-appropriate personal protective equipment (Occupational Safety and Health Administration, 2002: 1). Consideration of “Co-workers’ actual safety response” could also be effective in ensuring that all workers are appropriately protected (Lingard, Cooke & Blismas, 2011: 159). However, achieving this in Zimbabwe is difficult owing to the fragmented approach deployed by construction project stakeholders regarding OSH issues (Chigara & Moyo, 2014b: 150). Thus, all variables must be considered before appropriate personal protective equipment can be selected and this must be operationalized during productivity measurement so that outputs are generated concerning these variables.

3.3.4.1.4 Climatic Conditions

Hasan, Baroudi, Elmualim and Rameezdeen (2018: 932) reiterate that climatic conditions are one of the most significant factors that affect labour productivity. In support of this, Durdyev and Ismail (2016: 456) posit poor climatic conditions as one of the riskiest productivity external constraints. Whilst the compound effects of exposure to these extreme climatic conditions is low task productivity (Mincks & Johnston, 2004: 193), the extent can

only be determined within specific environments. In terms of the global threat of the climate change challenge, Zimbabwe has not been spared. Whilst empirical studies by Chigara and Smallwood (2016: 290) have shown a perceived positive effect of ambient temperatures on workers' productivity, there is a need to ascertain the extent to which this has impacted construction labour productivity. This was evidenced by Langston, Song and Purdey (2008: 65) who revealed significant satisfaction differences by employees on commercial buildings in aspects of air quality and temperature, albeit in different climatic conditions.

Mincks and Johnston (2004: 193) further advocate for pre-construction planning that fully analyses the relationship between productivity loss and the cost of temporary weather protection for cost-effective decisions to be made. Beyond the cost aspect, Sarode and Shirasath (2012: 2736) state that a comfortable work environment is where workers are exposed to a proper range of temperature, adequate ventilation and adequate humidity. They further report that provision of these would guarantee improved employee productivity. Chan, Yam, Chung and Yi (2012: 60) recognize that construction workers are increasingly being subjected to heat stress from both confined spaces and outdoor physical work areas. The ILO (2018c: 26) also acknowledges that the rising global temperatures have led to the prevalence of heat stress and this has reduced worker performance and given rise to negative occupational health effects and workplace injuries. While recognizing the difficulty in controlling climatic conditions, it is undeniable that failure to appropriately plan for these can have disastrous consequences. Therefore, attention at the planning level through productivity measurement is essential to reduce the effect of unfavourable climate conditions on the overall magnitude of construction labour productivity.

3.3.4.1.5 Working time

Smith and Zagelmeyer (2010: 393) define working time as the hours worked by employees within organizations. They further highlight that use of "over-time" does not have the same positive outcome as normal working time and that non-standard working time arrangements create constraints on the work-life balance of employees. Arditi, Ayrancioglu and Shi (2005: 488) also discourage the adoption of nighttime construction because of its being more hazardous owing to lighting and human factors. Emuze (2017: 330) recognizes long working hours as contributing to workers' unsafe acts. Construction companies need to move away from a culture of working long hours to improve the work-life balance of employees.

Townsend, Lingard, Bradley and Brown suggest that this is a positive way for organizations to reach productivity targets (2011: 70).

To utilize working time efficiently, Kattenbach, Demerouti and Nachreiner (2010: 279) report that flexible working time has become an accepted model in most areas of business. The Government of Zimbabwe (2013: 278) encourages the adoption of a 44-hour standard working week and the National Employment Council of the construction industry in Zimbabwe has generated productivity outputs based on these standard working times. Construction companies which generate their own productivity outputs must recognize the regulated standard working time and factor in any extra hours in their computations of productivity outputs.

3.3.4.1.6 Work premises

Beyond the need for adequate regulation, construction companies have the responsibility to maintain their premises because of the benefits that can accrue to them that include timeous completion (Aboagye-Nimo & Emuze, 2017: 285). Obiozo and Smallwood (2015: online) suggest “greening” worksite premises to increase workers’ productivity. Sarode and Shirasath (2012: 2735) confirm the direct impact of the physical aspects of the work environment on the productivity, health and safety and morale of workers. Abrey and Smallwood (2014: 7) empirically determined unsatisfactory working conditions as harmfully affecting productivity on construction sites. Similarly, Mincks and Johnston (2004: 191) state that the organization of work premises will affect the productivity of workers. They further mention adequate planning and crew supervision as being fundamental to significantly reducing the impact of inadequate conditions.

March (2009: 9) reports that the provision of adequate services of water and sanitation is also essential to ensure workers are not distracted from their core tasks. Naoum (2016: 413) also contends that the work environment and constraints on workers’ performance are factors that are highly likely to affect on-site labour productivity on construction sites. It is evident that adequate work premises are essential for improving construction labour productivity on construction sites; therefore, it is incumbent on construction companies to address this condition effectively. Sarode and Shirasath (2012: 2737) emphasize that nurturing workers is achieved by providing appropriate work premises.

3.3.4.1.7 Welfare facilities

The minimal requirements regarding welfare facilities are expounded in various statutory instruments. However, lack of appropriate regulation translates to construction companies’

inadequately budgeting for these and subverting minimum requirements during the construction phase (Akawi, Musonda & Pretorious, 2017: 520). The Government of Zimbabwe (2013: 281) is silent on the standards of facilities that should be provided; hence construction companies are not compelled by any specific regulation. However, various authors acknowledge the importance of welfare facilities within the productivity enhancement drive. The Construction Industry Development Board (CIDB) (2015: 14) indicated that the provision of adequate welfare facilities had a significant impact on construction workers' productivity. Mincks and Johnston (2004: 213) also report that the provision of adequate temporary facilities related to project requirements has a distinct impact on the profitability of the construction project and craftsperson productivity. Obiozo and Smallwood (2015: online) also recommend the creation of a construction site that is beneficial and comfortable for productivity improvement. Related to this, Smallwood and Haupt (2009: 1263) recommend welfare facilities that are gender-sensitive on construction sites as these affect wellness and performance.

March (2009: 10) supports the provision of welfare facilities such as the provision of sanitary conveniences, safe drinking water and rest, washing, changing and eating facilities on construction sites. In essence, the author attributes the provision of these to the minimization of productivity losses due to employees' dissatisfaction (Salaj *et al.*, 2017: 520). Welfare facilities are paramount to the health and well-being of workers and are regulated through various Acts and statutory instruments and this fragmented approach potentially affects their effective regulation. The apparent effect on construction labour productivity also requires productivity outputs' qualitative considerations to be implemented and effected on construction sites.

3.3.4.2 Role of demographics

In Zimbabwe, demographics of respondents cannot be ignored, considering the ratification period of the decent work agenda (Government of Zimbabwe, 2014: 25), connotations of gender imbalance in the construction industry, age of respondents and the different designations of respondents. The significance of workforce-related factors such as overtime and associated fatigue, level of workforce training and workers' health and well-being as factors that affect labour productivity (Durdyev & Mbachu, 2017: 28) is paramount within the decent work agenda. ILO (2013b: 1) reports that, in the labour market performance of 2012, gender gaps in the labour market participation have increased. Jimoh *et al.*, (2016:

1429) also relate to the need to address human resources challenges that negatively affect the participation of women in the Nigerian construction industry whilst.

The effect of demographics on the responses is pertinent. Chileshe and Yirenkyi-Fianko (2012: 592) reported on the impact of age on job satisfaction of white-collared construction workers. Chigara and Moyo (2014a: 57) also reported on the significant difference on managers' and workers' responses on the factors affecting labour productivity within Zimbabwean building projects, Adnan and Ressang (2016: 197) included different designations and varying work experiences as variables for investigating awareness of ergonomics on construction sites. Linhard and Larsen (2016: 663) acknowledge the importance of statistical difference in ranking differences amongst independent respondent groups in a study on key factors affecting construction project performance. Conen, Van Dalen and Henkens (2012: 629) also expand on the perceived relationship amongst age, labour cost and productivity as paramount to labour force participation rates. Ghoddousi, Poorafshar, Chileshe and Hosseini (2014: 811) illustrate discrepancies between perceptions of chief executive officers on labour productivity in Iranian construction projects and workers concerning the importance of health and safety aspects. Employee involvement is fundamental in integrating differences between white-collar and blue-collar workers on factors that impact labour productivity (Chan & Kaka, 2007: 580,581).

Chileshe and Haupt (2010: 108) support this analogy by highlighting the school of thought that claims the existence of differences with regards to the impact of demographics, such as age and length of service, on job satisfaction of construction workers in South Africa. This state of affairs requires introspection into targeted intervention strategies within the relevant population to ensure the realisation of decent work within the construction industry in its entirety.

3.3.4.3 Gap in the provision of decent working conditions

The nature of factors that affect labour productivity is skewed towards inadequate working conditions. Improvement of labour productivity is dependent on these decent working conditions, hence the nature of these conditions is required in the Zimbabwean construction industry.

3.3.5 Sustaining of construction labour productivity performance

Construction industries are inundated with challenges associated with the performance of labour (Mhlanga, 2018: 13). Project overruns within the Zimbabwean building industry have been attributed to manpower and organizational-related challenges (Chigara & Moyo

2014a: 62). Further to this, lack of adequate health and safety requirements, low remuneration and poor relationships between management and workers have continued to affect labour productivity (Chigara & Moyo, 2014b: 150; Charizeni & Chagonda, 2018: 16). This is owing to the absence of an enabling policy framework and active labour market policies that deal with decent work deficits that include vulnerable employment, low productivity and declining capacities of skills development (Zimbabwe United Nations Development Assistance Framework, 2010: 13).

Promotion of competitiveness, a synonym of productivity, has been seen as a way of achieving desirable changes, however, this should not be accompanied by social imbalance and environmental pollution (Despotovic *et al.*, 2015: 1). Clients, investors and other stakeholders are demanding continuous performance improvement (Robinson, Anumba, Carrillo & Al-Ghassani, 2005: 13). Despite companies having embraced sustainability in their policy commitments, they are finding it difficult to put them into practice (Hogevold, Svensson, Klopper, Wagner, Valera, Padin, Ferro & Petzer, 2015: 436). There is, however, greater awareness of the benefits of performance measurement in construction organisations (Robinson *et al.*, 2005: 13). Consequently, performance measurement is grounded in the investigation of relevant indicators and aggregating them towards computation of these industry-wide or nation-wide indexes.

3.3.5.1 Sustainability indicators for construction labour productivity

Due to sustainability reporting not yet being standardised, the Decent Work Agenda initiative was utilised to organise the indicators as shown in Table 3.9. Ghai (2002: 9) states that indicators provide specified objectives with a measure of the extent of achievement. It is thus imperative that appropriate indicators be selected that will provide a framework for measuring the extent of attainment of decent work as a function of labour productivity improvement.

ILO (2016b: 1) suggests that indicators are borne not only out of the specific sustainable development goal number 8 on decent work and growth, but they should also be found within the other relevant development goals, as mentioned in Section 2.2.2. These broad indicators are broken down by the ILO to become more specific and measurable. ILO (2013:12) refers to ten substantive elements that represent the structural dimensions (social, economic and environmental) of the decent work measurement framework and these shown in Table 3.9. The 10 substantive elements will be reviewed concerning the Zimbabwean context and their confines will be adjusted to suit the construction industry by

adding 2 more elements. The broad indicators referred to in Table 3.9 will thus birth more specific indicators within each of the 12 substantive elements. ILO (2013: 14) states statistical and legal indicators that can be utilised and they are reviewed hereafter.

Table 3.9: Indicators for sustainable performance of labour productivity

Substantive element	Statistical indicator	Legal framework indicator
Employment opportunities	Labour force participation rate Employment by status in employment Labour underutilisation	Government commitment to full employment Unemployment insurance
Adequate earnings and productive work	Working poverty rate Employees with recent job training	Statutory minimum wage
Decent working time	Employment with excess working time (44 hours per week) Time-related underemployment rate Paid annual leave	Maximum hours of work Paid annual leave
Combining work, family and personal life	Unusual hours Maternity protection	Maternity/ paternity leave Hours of work in unusual hours
Work that should be abolished	Forced labour rate	Forced labour including public policy to combat it
Stability and security of work	Precarious employment rate Subsistence worker rate	Termination of employment
Equal opportunity and treatment in employment	Occupational segregation by sex The measure of discrimination (by ethnicity, of indigenous people)	Equal opportunity and treatment Equal remuneration for men and women for work of equal value
Safe work environment	Occupational injury frequency rate (fatal and non-fatal) Time lost due to occupational injuries	Employment injury benefits Occupational health and safety labour inspection
Social security	Share of population above pensionable age benefiting from pension Public social security expenditure (proportion of Gross Domestic Product) Share of economically active population contributing to a pension scheme	Old age social security or pensions benefits Sick leave proportion
Social dialogue, workers' and employers' representation	Trade union density rate Collective bargaining coverage rate Days missed due to strikes and lockout	Freedom of association and right to organise Collective bargaining right Tripartite consultations
Economic and social context for decent work	Labour productivity (Gross Domestic Product per employed person, level, and growth rate) Income inequality Sustainable literacy levels	Labour administration
Environmental context	Environmental impact of labour administration	Labour administration and Environmental Management Agency regulatory framework

Source: ILO (2013: 14)

3.3.5.1.1 Employment Opportunities

This is a key element comprising indicators that consider the labour quantity demand and supply in an economy (ILO, 2013: 27). Of the indicators that are encompassed within this element, three are relevant to the context of the study; labour force participation rate, employment by status in employment and labour underutilisation.

3.3.5.1.1.1 Labour force participation rate

ILO (2013:46) defines the labour force participation rate (LFPR) as “the number of persons in the labour force given as a percentage of the working-age population”. ILO (2016b: 14) reports that the labour force is broken down to reflect sex and age groups thus providing a profile of the distribution within the country. This indicator is widely regarded as a potential economic growth indicator based on the level of Gross Domestic Product (GDP) and its growth rate and dependent on the quantity and quality of the labour force and its utilisation (ILO, 2013: 46).

LFPR can also be seasonally adjusted and disaggregated further by experience and level of skill so that intervention methods are directed at specific groups (ILO, 2013:47). This aggregation would auger well with the construction industry where such factors are key within the productivity discourse. Determinants of LFPR constitute structural, cyclical and accidental factors and these factors include policy and legal determinants that include flexi-time, family support, retirement schemes, apprenticeships, unemployment benefits, demographic and cultural factors and level of education amongst others ILO (2013:47). These factors do predominantly speak to economic, social and environmental sustainability aspects within labour force management and thus this indicator has the potential to have a tremendous measurable impact within the construction labour productivity context.

3.3.5.1.1.2 Employment by status in employment

Employment by status in employment (ESE) refers to the number of workers in each category of the employment classification given as a percentage of the employed population ILO (2013:54). For example, the total number of women employed within the construction trades category as a percentage of the total number of women employed. For a given group of the total employed population, the ESE is the percentage of this group that is classified in a given status in employment category (ILO, 2013:54).

Employees include both formal and informal workers and whether they have stable or unstable contracts ILO (2013:56). ILO (2016b: 15) suggest that this indicator assists both the dynamics of the labour market and the level of development within a country. Employment categories suggest degrees of economic risk and type of authority and this is expected to differ within the different demographic categories (ILO, 2013:56). This indicator reflects the structure of employment which ordinarily can only change slowly over time and strongly assists in measuring the impact of sustainability programs within the construction industry.

3.3.5.1.1.3 Labour Underutilisation

International Conference of Labour Statisticians (2013: 9) states that labour underutilisation refers to the unmet need for employment due to the mismatch between labour supply and demand. Moody (2018: 1) offers six alternative measures of labour underutilisation which include:

- Percentage of workers unemployed for more than 15 weeks
- Percentage of workers who have lost a job or completed a temporary job
- Percentage of workers that is unemployed but actively looking for work and ready to start a job
- Percentage of workers unemployed or discouraged
- Percentage of workers either unemployed, discouraged or marginally attached to the labour force
- Total of those unemployed, discouraged, marginally attached to the labour force or working part-time for economic reasons, measured as a percentage of the labour force plus the number of marginally attached.

3.3.5.1.2 Adequate earnings and productive work

ILO (2013:65) asserts that the concept of decent requires that work to be productive and earnings be adequate. The prerogative is that as workers contribute positively to the companies they work for, they should be rewarded adequately and the earnings should be in tandem with the cost of living within their localities. Earnings should include direct wages, salaries, paid leave, bonuses, transport and housing allowances (ILO, 2013:66).

3.3.5.1.2.2 Employees with recent job training

Training and retraining of workers are imperative within any organisation and more-so in the construction industry where mobility of workers or labour turnover is very high. Training needs will differ across the varied types of employees hence this indicator informs policy on enhancing productivity and competitiveness (ILO, 2013:89). Its drawback is that it does not inform on the content quality of duration of the training, however, it presents an opportunity for workers to improve on job-related competencies yielding potential productivity gains and greater job satisfaction (ILO, 2013:89).

3.3.5.1.3 Decent working time

This substantive element considers adequate working time arrangements which constitute a fundamental part of decent work (ILO, 2013:91). Due consideration must be made on the nature of work in the industry and regard for the health, safety and well-being of workers *vis-*

à-vis productivity requirements. ILO (2006b: 25) report on the five dimensions within which decent working time is to be considered and these are: its effect on health, family and work-life balance, gender equality, productive efficiency, and workers' capacity to influence their working hours. ILO (2016b:15) further support this assertion by remarking that working hours' impact labour costs, productivity levels and health and well-being of workers.

3.3.5.1.3.1 Employment with excess working time (44 hours per week)

Employment in excessive working time is an indicator of exposure to overwork (ILO, 2013:94), and different industrial sectors have different thresholds. In Zimbabwe, the working time week is 44 hours, however, overtime work is not regulated as is allowed for and this can contribute to overall excessive working times. ILO (2011: online) indicate that a working week of 49+ hours is excessive, therefore, the allowable working time week and overtime should not exceed this threshold.

Progressive increases in the indicator reflect a deterioration of decent work (ILO, 2013: 94). Computation of indicator considering demographics is essential and consideration of macroeconomic conditions, employment policy and labour supply is also pertinent to its competency. Thus, age groups, sex and employment status are demographic variables utilised within this indicator (ILOb, 2016: 16) again necessitating specified intervention strategies.

3.3.5.1.3.2 Time-related underemployment rates

This is a measure of employed persons willing and available to extend their working time beyond the formal working time (ILO, 2013:101). However, the far-reaching implications of this indicator include inadequate earnings, unproductive work and labour underutilisation disadvantaging both the organisation and the workers. Therefore, ILO (2016b: 17) relays that this indicator reflects the underutilisation of the labour force production capacity.

ILO (2016: 17) further intimate that the indicator provides the necessary information for enlightening employment-related problems, assessing human resources utilisation within organisations and assists in providing insights in the design, implementation and evaluation of employment, income and social programmes. This indicator increases during economic recessions and declines with economic expansion and it is recommended that the indicator is analysed with regards to GDP growth, employment to population ratio, the unemployment rate and employment-related income ILO (2013:102). It again would be worthwhile to consider this indicator within the demographic variables so that short- and long-term intervention methods can be effectively implemented.

3.3.5.1.3.3 Paid annual leave

The aim of paid annual leave is to preserve workers' health and well-being and ensuring productiveness and motivation (ILO: 2013: 105). Construction workers in Zimbabwe are entitled to annual paid leave according to regulations, however, it is the implementation that can be lacklustre. ILO (2013:105) reports that since this is both a statistical and legal framework indicator, certain information, which is difficult to acquire, is required.

3.3.5.1.4 Combining work, family and personal life

ILO (2013: 106) confirms that this broad indicator covers a small set of decent work indicators related to standards and fundamental principles and rights at work and social protection. Generally, these are indicators that consider the work-life balance of workers is upheld to encourage strongly founded families with consequent satisfied and productive employees.

3.3.5.1.4.1 Unusual hours (e.g. night work)

Whilst the collective bargaining agreement in Zimbabwe allows for shift work that can extend to night work, effectively it allows workers' exposure to unusual hours of work. Therefore, this indicator is crucial in addressing the decent work and sustainability concerns within construction workers' productivity (ILO, 2013: 108).

3.3.5.1.4.2 Maternity protection

The existence of casual and short-term labour contracts in the Zimbabwean construction industry presents a challenge in maternity protection. Further to this, this potentially could be a push factor for women's low uptake in the construction industry. Hence, efforts must be made to address this aspect if the welfare of females is to be achieved. ILO (2013:109) reports that since this is both a statistical and legal framework indicator, certain information is required to ascertain its fulfilment and this includes the duration, type of contract and number of contributions that entitle workers to access maternity leave.

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3.3.5.1.5 Work that should be abolished

ILO (2013: 112) reiterate that International Conventions and the ILO Declaration on Fundamental Principles and Rights at work require certain types of work that include forced labour to be abolished. They further state that measurement of these works should be undertaken to enable actioning and monitoring towards its elimination.

3.3.5.1.5.1 Forced labour rate

Forced labour is borne in the context of paid employment relationships and also disguised in employment relationships is customised to the national setting (ILO, 2013:121). Further to this, forced labour confirms diminished decent work conditions and effects other broad indicators like decent working time, adequate employment treatment, social protection etc. Forced labour can take many forms that include; prison labour and compulsory work for state projects and these should be carefully considered (Ghai, 2002: 19).

3.3.5.1.6 Stability and security of work

ILO (2013: 127) describes the stability and security of work as a dimension that allows for differentiation of relatively permanent jobs without subsistence working conditions from others. It is evident from the nature of the construction industry that stability and security of work are rather precarious. Fundamentally, this element is driven more by the companies' need to remain economically sustainable however affecting the workers.

3.3.5.1.6.1 Precarious employment rate

Precarious employment rate consists of employment with the common elements of being precarious, short term and unstable (ILO, 2013: 130). The indicator may be complemented by a component indicator by calculating the share of a given component in total precarious employment (ILO, 2013: 130). For example, the share of casual workers in precarious employment. Positive progress is determined by achieving low levels or a declining trend whilst an increasing rate indicates rising instability and declining security (ILO (2011: online). Demographic consideration is also important as this determines targeted interventions according to sex, age group etc. It is worth analysing in conjunction with other indicators like GDP growth rate, labour force participation rate, unemployment rate etc. (ILO, 2013: 130). It is also important to establish whether such employment is voluntary so as not to misrepresent the findings.

3.3.5.1.6 2 Subsistence worker rate

As this rate increases, an indication of declining stability and security of work ensues. The indicator is prevalent in developing countries where prolonged economic recessions are commonplace (ILO, 2013:134). It is recommended to consider the level of education attained as this is important especially concerning construction trades practitioners who leave formal paid employment and go for subsistence work which has a higher "payoff".

This indicator must be analysed concerning indicators like excessive working time, safe work environment, social security etc.

3.3.5.1.7 Equal opportunity and treatment in employment

ILO (2013:141) reiterate that equal opportunity and treatment in employment is a central element in the Decent Work Agenda and that it targets gender equality and non-discrimination. The current nature of the Zimbabwean construction industry supports the consideration of this indicator. The existing gender imbalance and potential discrimination is worrisome and requires urgent attention if labour productivity performance is to be sustained.

3.3.5.1.7.1 Occupational segregation by sex

Computations in this indicator might reflect gender differences in access to employment opportunities and provide targeted actions to address this anomaly within the various occupational groups. ILO (2011: online) considers this indicator to hurt the labour market efficiency, contributes to rigidity and male-female wage differentials.

ILO (2013:141) extends three measures of occupational segregation by sex being the female share of employment (relative to the male share) in each of the sub-major groups, occupational distribution of employment by sex (using sub-major groups) and Duncan Index of Dissimilarity (using sub-major groups).

3.3.5.1.7.2 Measure of discrimination

Ghai (2002: 21) state that discrimination is often deeply rooted in cultural prejudices and inequalities in access to health, education and amenities and therefore any intervention methods should deal with these root causes. Ghai (2006: 28) bemoan the lack of data on all other different types of discrimination except gender issues, and state that it makes it difficult to adequately address this indicator.

Since this is both a statistical and legal framework indicator, certain information is required to ascertain its fulfilment and this includes (ILO, 2013:141). This information includes whether non-discrimination is provided for by legislation, what grounds are covered by it, which workers are covered by it, what remedies provided for and what the role of the relevant inspectorate is, comments by relevant labour organisations that include ILO supervisory bodies and trade unions and an estimate of workers covered by the law.

3.3.5.1.8 Safe work environment

Ensuring adequate occupational health and safety is essential within the Decent Work Agenda (ILO 2018: 40). ILO (1992: 1) articulates that the objectives of a safe work environment provide practical guidance on a legal, administrative, technical and educational framework to prevent accidents and diseases and harmful effects on the health of workers arising from employment in construction; ensuring appropriate design and implementation of construction projects; providing means of analysing from safety, health and working conditions, construction processes, activities, technologies and operations, and of taking appropriate measures of planning, control and enforcement.

3.3.5.1.8.1 Occupational injury frequency rate (fatal and non-fatal)

ILO (2018: 40) recognises the importance of working conditions as a determinant to living standards for workers and their families. The total fatal and non-fatal injuries per hours worked within the construction industry would be important to aid preventative interventions. ILO (2013:154) remark that the aid of the indicator in providing information to enable planning for preventative measures with regards to disaggregated demographic aspects if sex, occupation, economic activity etc. Further to this, reporting on fatalities, non-fatalities, incidences and injuries is reported to be problematic in developing countries and due regard to this must be made when analysing the data. ILO (2011: online) states that fluctuations of the indicator reflect changes in working conditions and environment, modifications in data collection methods and revisions of regulating laws. ILO (2018: 43) argues that the variability of sources of information within this indicator hinders the collection of consistent information as the unit, the type and the context is different. Therefore, a clear approach to the collection of this information has to be agreed within the demographic variables.

3.3.5.1.8.2 Time lost due to occupational injuries

This indicator is essential in ascertaining the estimated cost of occupational injuries and designing targeted prevention mechanisms (ILO, 2013: 162). The major challenge with this indicator is under-reporting and analysing trends rather than levels is best under these circumstances. Construction companies are demotivated to undertake precise reporting as this has an impact on insurance costs. However, the advantage is the NSSA has the mandate of collecting this information, and through them, some semblance of accuracy can be achieved.

3.3.5.1.9 Social security

Social security systems are paramount to ensuring decent healthy and living conditions are ascertained during the working life and after retirement for construction workers (ILO 2018: 46). ILO (2018c: 104) reiterates that social protection policies safeguard and promote human rights and Ghai (2002: 17) add that they are designed to meet urgent needs for subsistence and to provide against contingencies. However, Comaru and Werna (2013: 12) report on poor workers being least protected from numerous risks associated with inadequate social security. On the other hand, the construction industry has a poorly subscribed pension scheme mostly owing to the nature of intermittent employment structures (Uzhenyu & Marisa, 2017: 91). Further to that, the nature of the contracts of construction workers also contributes to this anomaly added to the fact that most construction companies generally do not make social security contributions for their workers. Therefore, the indicators within the broad element will consider the different types of contingency within the construction industry which are captured within those receiving pensions, the social security expenditure on construction workers and those contributing to pensions.

3.3.5.1.9.1 Share of population above pensionable age benefiting from construction workers' pensions

ILO (2013:169) reports that types of schemes existing in a country are important in the analysis of results. Also, those that take early retirement and those that postpone retirement should be taken into account in the computations. ILO (2011: online) states that a rise in the indicator indicates an increase in pension coverage. However, ILO (2018: 49) argues that measuring the population proportion is not enough, there is further need to analyse the cash value of the benefit and interpreting on whether it is sufficient to meet the basic cost of living standards gazetted by the relevant consumer organisations. In Zimbabwe, there has been an erosion of pension benefits due to currency distortions in the past two decades, hence by measuring the proportion of the population benefiting from the pensions will give a distorted picture of the reality of decent health and living conditions.

3.3.5.1.9.2 Public social security expenditure (proportion of Gross Domestic Product)

Information on public social security expenditure is mainly captured by NSSA in Zimbabwe and sectorial information is pertinent in this regard. ILO (2013:176) states that its analysis presents inherent difficulties in understanding the composition of the national social security system and interpretation of the legal framework of public social security. ILO (2011: online)

also relay the other limitation of failure to indicate the population coverage and average expenditure for those covered, which should be contextualised within this indicator. Therefore, the collection of precise information is paramount to the success of this indicator.

3.3.5.1.9.3 Share of economically active population contributing to a construction workers' pension scheme

In Zimbabwe, the construction industry pension fund is mandated to administer the construction workers' pensions. ILO (2018: 49) suggest that the integrity of the scheme should be analysed and aspects of contributory, universality and means-tested schemes should be considered to allow effective coverage to be ascertained. The low levels of wages within the construction industry generally directs workers towards predominantly contributory social insurance schemes that have low effectiveness in terms of compensation. The age interval for this indicator should be the economically active population below the statutory age for retirement, for example, 15 to 64 (ILO, 2013:181). Results should be analysed concerning contextual information especially on the predominant existence of a contributory or non-contributory insurance scheme.

3.3.5.1.10 Social dialogue, employers' and workers' representation

ILO (2013: 190) underpins the function of this broad indicator as to build consensus among actors in the world of work by covering all types of negotiations, consultation and exchange of information between representatives of governments, employers and workers on issues of common interest. ILO (2018c: 92) report that social dialogue is a collaboration between the workers and the employers aimed at reaching consensus on the following aspects: prevention and reduction of the environmental impact of companies; auctioning environmental policies and plans; improving working conditions through minimising risks to the health of the worker; preservation of job quality and promotion of green jobs; and enhancing widespread stakeholder participation in environmental decision-making.

3.3.5.1.10.1 Trade union density rate

The indicator is computed as the percentage of workers in a given reference group who are trade union members (ILO, 2013:193). A changing density rate indicates a relative change in trade union membership compared to eligible workers (ILO, 2011: online). It indicates the extent of the exercise of freedom of association and it can help in assessing and monitoring the development of industrial relations (ILO, 2013:193). However, the computation is affected by the lack of reliable and comprehensive data sources. The union density rate

should also not be used as a sole indicator of the bargaining power of unions as its level may not have a bearing on this. In Zimbabwe, whilst the activities of trade unions are regulated, membership is not mandatory and the potential view that it is an unnecessary cost to workers is very high thus further affecting their uptake.

3.3.5.1.10.2 Collective bargaining coverage rate

While the indicator gives some indication on the exercise of collective bargaining rights, it does not reflect the outcomes of those negotiations (ILO, 2013:198), neither does it relay information on the impact of these bargained positions on the workers and the demographic variable considerations of the collective bargaining. ILO (2011: online) state that changes in these rates potentially reflect changes in national legislation, reporting requirements and employee coverage. As a motivation for this indicator, gains have been recorded with regards to access to training and skills development of construction workers where the presence of employee representation bodies for collective bargaining exist (ILO, 2018b: 22)

3.3.5.1.10.3 Days missed due to strikes and lockouts

Analysis should be broad and consider other broad indicators like social security, termination of employment, right to strike etc. (ILO, 2013:201). The reasons for the strikes and lockouts are important qualitative assessment instruments and the relevant data should be collected and interpreted within its reporting.

3.3.5.1.11 Economic and social context for decent work

ILO (2013: 206) recognises its importance in its consideration of indicators, within the economic and social context, that help to interpret the decent work indicators classified under the ten substantive elements. The indicators of labour productivity growth rate, income inequality and sustainability literacy and considered within this substantive element.

3.3.5.1.11.1 Labour productivity growth rate

ILO (2016:18) reports that the economic growth of a country is dependent on the policies that encourage effective work by employees therefore the labour productivity growth rate is measured as the annual change in labour productivity. This indicator can serve to develop and monitor the effects of labour market policies that ultimately culminates in improved health and skills of workers (ILO, 2013:216). ILO (2018: 11, 14) also relay that statistics on labour productivity provide information on the quality and efficiency of human capital in terms of specific education and training policies together with the consequent living standards of the associated workforce.

However, the generation of information on the factors that drive labour productivity growth or lack thereof is pertinent and should form part of the reporting within this indicator to allow solutions to be implemented within specific timeframes. Further to this, a limitation of this indicator is its failure to consider differences in age group coverage and treatment of special groups as disaggregation by sex or age is not considered within this indicator (ILO, 2018: 15). However, this study seeks to adapt this indicator to provide such demographic information by attempting to measure the GDP within demographic variables in the construction sector.

3.3.5.1.11.2 Income inequality

Ghai (2002: 22) highlights the disparities of earned income share between women and men even for the same occupations. The gender imbalance in the Zimbabwean industry potential reflects income inequality. Beyond that, the wage levels within the sector need attention when compared to other economic sectors in the country.

3.3.5.1.11.3 Sustainable literacy levels

Whilst ILO (2016: 18) recognises educational attainment and illiteracy in terms of general skills levels of workers, the current sustainability drive would require an indicator that specifically considers workforce sustainability literacy levels. ILO (2018b: 18) also reports that training is more pronounced in larger companies as compared to smaller companies.

The importance of sustainability literacy in developing countries cannot be over-emphasised, where training curricula for both skilled and semi-skilled workers is seemingly inadequate and in other circumstances devoid of such instruction. Demographic considerations are considered important within this discourse, where sex and age groups are utilised and provide for clarity in terms of operationalising sustainability literacy advances.

3.3.5.1.12 Environmental context

The environmental context is fundamental within the construction industry. Theyel (2000: 264) supports the assimilation of environmental management systems within the firm's core business due to the guarantee of achieving continuous and sustainable improvements. This endeavour cascades into the workers' duties and thus entails workers' environmental management competence to be measured.

3.3.5.1.12.1 Environmental impact of labour administration

Though ILO (2013: 242) relates to labour administration, in general, as an indicator, this study will adopt it towards its impact on environmental aspects, thus activities within this

indicator would include policy-shaping, formulation and implementation with a specific focus on the environment. ILO (2018c: 28) confirm that decent work deficits contribute to environmental degradation through lack of employment, income insecurity and training opportunities and awareness.

These broad and specific indicators have the potential to transform construction productivity by providing a strong basis upon which performance can be measured especially within sustainability concerns. The ideal situation of workers' preservation can sufficiently be upheld through these robust indicators. However, the applicability of these indicators can only be ascertained by the key stakeholders in the Zimbabwean construction industry who include site managers, project managers, regulators and educators.

3.3.5.2 Gap in performance measurement for sustaining construction workers' productivity

The gap arises with emphasis on the Zimbabwean construction industry. The status of the industry reflects the need to vastly inculcate sustainability development dimensions into construction labour productivity determinants. This then validates the indicators that have been proposed by the ILO. More so, the absence of any performance measure negates the prerogative to purposely engage indicators. It is also apparent that these indicators impact performance discourse with different magnitudes. For example, the sustainability literacy level indicator might have a greater impact than the trade union density rate, especially in the construction labour productivity discourse. Hence, a competent selection of indicators is vital.

3.4 CHAPTER SUMMARY

This chapter considered Zimbabwean construction industry setting with regards to construction labour productivity. Regulators, educators and construction organisations were discussed concerning the study area. The construction labour productivity determinants were then considered. The origins and current status of corporate social responsibility discussed within the confines of the study area. Frameworks, types, nature and benefits of corporate social responsibility were also discussed with emphasis on its relationship with the social security of workers. Added to that, the role of demographics within corporate social responsibility was uncovered and the gap in knowledge exposed.

People-centred management aspects were also considered concerning ensuring adequate employment treatment. Management theories and styles were discussed to expose suitability to the sustainability development drive. The differences between production-

centred management and people-centred management were outlined and the people-centred management aspects expanded on. The role of demographics was also explained and the gap in knowledge with regards to people-centred management exposed.

Sustainability literacy was deliberated on with regards to the training of both skilled and semi-skilled workers. This was undertaken to enhance adequate work and a safe work environment. Sustainability learning objectives were discussed with attention on achieving substantive elements of decent work. The role of demographics was also deliberated on and the gaps in knowledge uncovered.

Provision of decent working conditions was a vital determinant on construction labour productivity that was discussed concerning how it ensures improved productivity. Emphasis was placed both on productivity improvement through decent on-site conditions for the generation of realistic outputs. Relevant decent working conditions were discussed within the Zimbabwean context. Again, the role of demographics was explained and the gap in knowledge exposed.

Finally, sustaining the performance of construction labour productivity was considered. Selection of indicators was fundamental, and these were drawn from the International Labour Organisation's Decent Work Agenda. Potential indicators, based on relevance to the study area were discussed with emphasis on how demographic variables are important within their constructs. The gap in knowledge was then exposed.

CHAPTER 4: RESEARCH METHODOLOGY

4.1 INTRODUCTION

The research framework, philosophy, methodological approach, strategy, methodological choice, time horizon, research design, data collection, data analyses, data reliability and validity and research ethics is presented in this chapter. Justification of the research methodology is also highlighted in the chapter.

4.2 RESEARCH FRAMEWORK

Figure 4.1 presents the research framework for this study. The framework follows the research onion proposed by Saunders, Lewis and Thornhill (2017: 124).



Figure 4.1: The research 'onion' for the study

Adapted from Saunders, Lewis and Thornhill (2016: 124)

The approach to using this framework is explained and justified with regards to the choices made within each layer from philosophy to data collection and analysis.

4.2.1 Research philosophy

Blumberg, Cooper and Schindler (2008: 19) assert that the basis of the research in theory and observations and that knowledge of research philosophies clarifies the appropriateness of research design. Creswell (2009: 4) reports that a research approach would incorporate the philosophy, design and specific methods. Creswell (2013: 16) defines philosophy as the use of abstract ideas and beliefs that inform our research and that philosophical assumption

are the first ideas in developing a study. Hence, the philosophical world view is indeed vital to research (Iluah & Eaton, 2013: 935). Blumberg, Cooper and Schindler (2008: 23) suggest that ‘perfect’ research should combine the two most distinguished and extreme research philosophies of positivism and interpretivism. Added to this, Chynoweth (2009: 301) states that the built environment is multidisciplinary, with studies being characterised by a pragmatic and issue-driven approach. The reality, though, is that construction-related studies are predominantly positivist in nature (Panas & Pantouvakis, 2010: 70). This is further supported by studies by Jang *et al.* (2011), Jarkas and Bitar (2012) and Ulubelyi, Kazaz and Er (2014) where natural science methodologies were utilized that included correlation and regression analysis.

Positivism is the metatheory deployed in natural science and is also referred to as “logicism”, “scientism” or “modernism” (Sousa, 2010: 464). Babbie and Mouton (2015: 20) explain the positivist view as the pursuit of natural science for progressing social science research. Positivism adopts a stance that argues that the explanation of human behaviour is in terms of cause and effects, entails working with an observable social reality to produce law-like generalisations (Saunders, Lewis and Thornhill, 2016: 135). The assumption for certainty and controllability of the future is the cornerstone of the positivist and these augers well to sustain construction labour productivity. This study was best suited to this philosophy because the objectives sought to reveal the significance of construction management aspects on decent work substantive elements. The use of natural science to predict construction labour productivity performance through decent work deficits and demographic variables of stakeholders further supports this philosophy. Further to this, statistical analysis was used on quantitative data to ascertain facts. The ontological, epistemological, axiological and paradigm assumptions for the positivism philosophy are presented in Table 4.1.

Table 4.1: Assumptions of positivism

Positivism			
Ontology (nature or reality or being)	Epistemology (What constitutes acceptable knowledge)	Axiology (role of values)	Paradigm (Political or ideological orientation)
Real. External, independent One true reality Ordered	Scientific method Observable and measurable facts Law-like generalisations Causal explanation and prediction as to the contribution	Value-free research The researcher is detached, neutral and independent of what is researched Researcher maintains an objective stance	Regulation perspective Functionalist

Source: Saunders, Lewis and Thornhill (2016: 132, 136)

Eriksson and Kovalainen (2016: 13) proclaim that ontology, epistemology, axiology, and paradigms are fundamental philosophical issues in research. This is supported by Mkansi and Acheampong (2012: 132) when they highlight that a coherent classification of the philosophy: ontology, epistemology, and axiology, and the quantitative dichotomy, is crucial. They further report that though they have a common theme with differing emphasis, there is no consensus in the classification and categorisation of these paradigms. Creswell (2013: 20) defines ontology as relating to the nature of reality and its characteristics while Gray (2009: 17) reports that it is a study of being, that is, the nature of existence. Ontological beliefs vary from realism, relativism, physicalism and idealism (Woodward 2015: 3580). Saunders, Lewis and Thornhill (2016: 127) assert that the ontological assumption shapes how the research objects are seen and studied. Ontological physicalism suits the study due to its alignment to the idea that reality only exists as can be described and explained by concepts, laws and entities of science (Woodward, 2015: 3579). Sustainability related aspects in this study were considered, as country-specific context, and utilised to benefit construction workers, in terms of their welfare, and construction companies, in terms of improved productivity.

Epistemology provides a background for deciding what kind of knowledge is important and adequate (Gray, 2009: 17, Creswell 2013:20). The positivist philosophy assumes that objective facts offer the best scientific evidence which resulted in the use of quantitative research methods (Saunders, Lewis & Thornhill, 2016: 127). Fundamentally, the methods allowed the collection of data free from the influence of the researcher. Nature of the data itself was limited to factual insights that allowed for descriptive and inferential statistical analysis. Due to that, the research findings were found to be generalisable and this was considered legitimate for the research. The derivation of regression models for sustaining construction labour productivity performance was anchored on causal explanations and prediction. Axiology refers to the role of ethics and research values in the research process (Saunders, Lewis & Thornhill, 2016: 127). Thus, the axiological assumption considers the values the researcher anticipates (Creswell, 2013: 20). The researcher was detached, neutral and independent from what was researched to achieve objectivity. The choice of using questionnaires to collect data reveals a value-free approach where the personal values of the researcher were suppressed.

Saunders, Lewis and Thornhill (2016: 132) define a paradigm as “a set of basic and taken-for-granted assumptions which underwrite the frame of reference, mode of theorising and

ways of working in which a group operates". The paradigm concept is widely used about a world view of a belief system that guides a research (Eriksson & Kovalainen, 2016: 17) and it is also referred to as a theoretical perspective (Gray 2009: 17). Saunders, Lewis and Thornhill (2016: 132) report that paradigms differentiate regulation - radical change perspective and subjectivist – objectivist positions and thus propose four paradigms of organisation analysis (radical humanist, radical structuralist, interpretive and functionalist). This study was of the regulation perspective where consensus, integration and cohesion were sought towards improving organisational and social worlds with regards to construction labour productivity in Zimbabwe (Saunders, Lewis & Thornhill, 2016: 132). The quest to integrate sustainability dimensions in construction labour productivity is well entrenched in this perspective. A functionalist paradigm, which is underpinned in the positivist philosophy, was utilised (Saunders, Lewis & Thornhill, 2016: 132). The authors further explain that this paradigm is located on the objectivist and regulation perspective, where rational explanations and the development of recommendations for improvements are sought. The contribution of demographics to perceptions on the relationship between variables in the study reveals this paradigm and expands the integration of sustainability dimensions.

4.2.2 Approach to theory development

The inclusion of theory is a strong characteristic of research (Saunders, Lewis & Thornhill 2016: 144). Blumberg, Cooper and Schindler (2008: 24) convey that there are two different reasoning approaches: deduction and induction. They further differentiate the two by describing deduction as starting with theory to test or solve a theoretical contradiction and induction as drawing theoretical considerations from observations. Saunders, Lewis and Thornhill (2009: 124) attest that deduction is the dominant research in the natural sciences while the inductive approach is concerned with the context in which events take place and allows for alternative theories to be suggested. Dainty (2007: 9) bemoans the disconnection to social insights through lack of methodological diversity, by a focus on deduction in the built environment. Studies by Chan and Kaka (2007) and Dai, Goodrum and Maloney (2009) successfully undertook construction productivity studies through utilising both deductive and inductive reasoning approaches. However, Panas and Pantouvakis (2010: 70) confirm that a majority of research articles in construction productivity are linked to objectivist philosophies as deduction continues to be the most trusted approach.

The positivist philosophy of this study implied deductive reasoning as being fundamental to the study. Leedy and Ormond (2013: 17) states that deductive reasoning begins with statements or assumptions the researcher primarily takes to be true. The deductive approach was used in testing whether the various strategies, aspects, learning objectives and conditions were perceived as being significant towards achieving specific decent work substantive elements. Further to this, model development entailed the selection of significant indicators towards establishing and sustaining construction labour productivity performance.

4.2.3 Methodological choice

Saunders, Lewis and Thornhill (2016: 164) state that the methodological choice is whether the study will follow a quantitative, qualitative or mixed-method research design. Since the methodology and the nature of collected data are intertwined, the methodological choice is important towards resolving the particular research problem (Leedy and Ormond, 2016: 94). The trend in management research is increasing to the use of methods and approaches that provide a middle ground between positivist and phenomenological perspectives (Mangan, Lalwani & Gardner, 2004: 565). In recent years, the use of both qualitative and quantitative research methods has received significant attention (Yeasmin & Rahman, 2012: 154). However, the quantitative approach has been most suited for the development of models that reflect the abstractions of construction environments (Panas & Pantouvakis, 2010: 70). Utama, Chan and Gao (2016: 79) also endorses that quantitative research steers the bulk of research on international construction projects and productivity.

The positivist philosophy is associated with a quantitative research design (Saunders, Lewis & Thornhill, 2016: 166), hence this was utilised in this study. Naoum (2013: 39) describes quantitative research as being 'objective' in nature. The author further confirms it as an inquiry-based testing a hypothesis of theory composed of variables concerning social or human problems. Babbie and Mouton (2015: 49) expand by stating that it includes an emphasis on quantification, variable analysis and statistical controls. The requirements of the study of testing various hypotheses supported the selection of this methodological choice. The need to collect numerical data on respondents' rating on perceptions related to the effect of strategies, aspects, objectives and conditions on decent work substantive elements supported this choice.

4.2.4 Strategy

Saunders, Lewis and Thornhill (2016: 177) define a research strategy as “a plan of how a researcher will go about answering his or her research question”. Quantitative research methodological choices are connected with survey research strategies (Saunders, Lewis & Thornhill, 2016: 168). Utama, Chan and Gao (2016: 79) support that the survey method of data acquisition is dominant within studies on international construction projects due to its advantage of enabling the researcher to accurately find the data and the source. Survey research entails the acquisition of information from respondent groups concerning their characteristics, perceptions and experiences (Leedy and Ormond, 2013: 189). The need for varied and quantitative data within the study of construction productivity supports this strategy (Gouett *et al.* 2011; Chigara & Moyo, 2014a, Durdyev & Ismail, 2016). It was also advantageous in that it allowed for the collection of large amounts of data, supported the deductive approach, and was suited for the descriptive and explanatory type of research (Saunders, Lewis & Thornhill, 2009: 144). These reasons entitled it to be a paramount strategy for this study as its specifics are captured within its suitability.

4.2.5 Time horizon

Time horizons are the determination of whether the study is a snapshot in time or a series of representation of events over a given period (Saunders, Lewis & Thornhill, 2016: 200). Saunders, Lewis and Thornhill (2009: 155) differentiate the two-time horizons, cross-sectional and longitudinal, in which research is conducted. A cross-sectional time horizon is selected when answering a question of solving a problem which necessitates data to be collected within a particular time. The use of a questionnaire survey strategy justifies the selected time horizon. Added to this, the nature of the data, insights on variables, is not observable over a long time but instantaneous.

4.3 RESEARCH DESIGN

Babbie and Mouton (2015: 74) define research design as a research plan or blueprint and the research methodology as focusing on the research process and the tools and procedures to be utilised. Gray (2009: 131) expands it as an overarching plan for the collection, measurement and analysis of data for particular research. Setting a relevant plan or blueprint is thus critical if the successful response to research questions and validity and reliability is to be achieved. Babbie and Mouton (2015: 76) classify research design type as either empirical or non-empirical, where empirical research is entrenched in collecting primary data and analysing existing data and non-empirical research is not. Hence this was

an empirical study, where surveys and statistical analysis were utilised. Further to this, Blumberg, Cooper and Schindler (2008: 10) define a descriptive study as that which attempts to describe, or define, a subject by the creation of a profile of a group of problems, people or events. Babbie and Mouton (2015: 81) also define an explanatory study as one that attempts to expose causality between variables and events. All the sustainability concerns are interrogated through both the descriptive and explanatory purpose. The objectives of this study are enshrined in it being both descriptive and causal (Blumberg, Cooper & Schindler, 2008: 10,11). The need for developmental corporate social responsibility strategies, the effect of people-centred management in the industry, the current state of skills and training development, the fundamentals of the decent working conditions and the intricacies of sustaining labour productivity performance are all undone as descriptive and or causal studies.

The research process flowchart for the study is illustrated in Figure 4.2. The conceptualisation of identified construction labour productivity determinants, decent work substantive elements and demographic variables were undertaken with recognition of the gap in knowledge. This culminated in the construction of a questionnaire and an initial pilot survey being carried out. Recommendations of the pilot survey aided the operationalisation of a competent survey instrument. Data collected from respondents were tested for reliability before descriptive statistics and hypotheses testing was undertaken. Hypotheses tests on the contribution of construction labour productivity determinants strategies, aspects, objectives and conditions to pre-determined decent work substantive elements of social security, adequate employment treatment, adequate productive work, safe working environments and productivity improvement were done concerning the selected demographic variables. The tests included correspondence analysis, Pearson Chi-squared tests, Mann-Whitney U tests, Kruskal-Wallis tests, Pearson bivariate correlation method and Regression analysis. Conclusions from the objectives, general conclusions and conceptual conclusions from the data analysis contributed to knowledge on establishing and sustaining construction labour productivity performance in Zimbabwe.

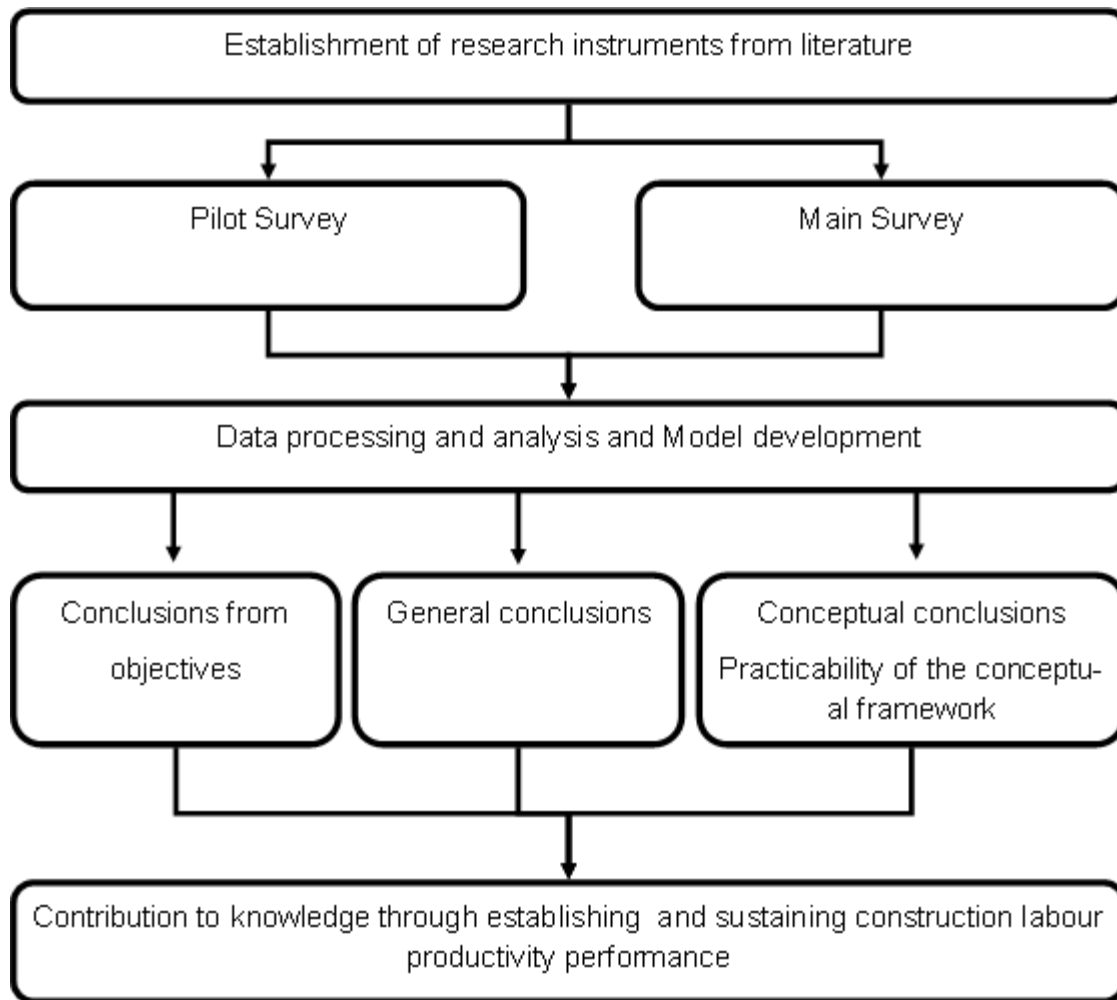


Figure 4.2: Research process flow chart

4.4 THE DATA

4.4.1 Primary data

Primary data is data collected afresh and for the first time and is thus original (Kothari 2009: 95; Babbie & Mouton 2015: 78). Collection of quantitative data was undertaken through an emailed questionnaire, self-administered and interviewer-administered questionnaire survey.

4.4.2 Secondary data

Secondary data originates from other sources and its collection was through the use of the desk study approach (Naoum, 2007: 22). These are statistical or descriptive records in the form of publications through journals, textbooks, government reports, private sector reports, diaries and newspapers, related to this study.

4.4.3 Population

A population is the total number of possible units or elements that are included in a study (Gray, 2009: 148). The targeted population consisted of construction organisation bodies, construction companies, vocational training institutions, regulatory inspectorates and skilled and semi-skilled workers within construction sites. Construction companies registered with the Construction Industry Federation of Zimbabwe were utilised. The skills of bricklaying, painting, carpentry and joinery formed the basis of the study, within the contractor organisations and vocational training institutions as they are common in both frameworks. The basis of the choice is also on these being the major skills that the National Employment Council (NEC) for the Construction industry has continuously monitored in terms of productivity output levels. Further to this, the critical path activities usually incorporate these major skills in any building project hence they have the greatest impact in terms of time and cost overruns.

4.4.4 Sample

The foundation of a good sample is on the accuracy and precision of its characteristics' representation of the population (Blumberg, Cooper & Schindler, 2008: 232). A definite plan for obtaining a sample within a population is termed a sampling design and the basis for selection of the design is on the representation basis and element selection technique (Kothari, 2009: 55, 59). On the element selection technique, this study considers both unrestricted and restricted sampling (Blumberg, Cooper and Schindler, 2008: 235) depending on the specific respondents within the population. Construction organisation bodies, construction companies, vocational training institutions and inspectorates formed the restricted sample while skilled workers are considered in unrestricted sampling, as shown in Table 4.2. On the other aspect of representation basis, both probability and non-probability sampling were operationalised.

Consideration was given to different databases of construction companies. These include the Construction Industry Federation of Zimbabwe (CIFOZ), the Zimbabwe Building Contractors Association (ZBCA) and the Ministry of Public Works. The database that had the most companies were selected as all construction companies in the other two databases are also members of the Construction Industry Federation of Zimbabwe. Proportionate stratified random sampling is suitable to select the construction companies from the CIFOZ 2018 list of companies across all categories. This is necessitated by the belief that responses may differ due to the categories of the companies and due to a need to increase

statistical efficiency (Gray, 2009: 150; Blumberg, Cooper & Schindler, 2008: 245). The sample size should reflect the views of the population (Blumberg, Cooper and Schindler, 2008: 241). A confidence interval of 95% is sufficient, with the margin of error of 5% (Gray, 2009: 150; Saunders, Lewis & Thornhill, 2016: 281). Since the population of construction companies within the study area is 83, 63 of the companies were considered in the study.

The sample size for non-probability sampling techniques depends on the current state of the industry and the depth of information required and hence was set as the study progressed. The prerogative was to select all the respondents on construction sites and this was mostly relevant to skilled and semi-skilled workers. On construction sites, all skilled workers for the trades of bricklaying, painting and carpentry and joinery were targeted. The skilled workers within each class in each trade and worker exempted (WX) according to the NEC worker grades were subjected to interviewer-administered questionnaires. Again, the selection was based on the fact that these are trades that are primarily undertaken by main contractors on construction sites, are taught trades at vocational training institutions in Zimbabwe and the NEC has benchmarked their productivity outputs. Skilled workers are fundamental stakeholders as they are the ones who undertake the tasks on sites and on whose work labour productivity is based.

All the other respondents, as shown in Table 4.2, were all selected through cluster sampling where the respondent groups conformed to geographical area and type of projects (Saunders, Lewis & Thornhill, 2016: 291). All lecturers from vocational training institutions within the relevant trades were selected. Stakeholders that include all NEC inspectorate officers, NSSA inspectorate officers, EMA inspectorate officers, NAMACO committee members were selected within the study area of Harare and Bulawayo. The relevance of these stakeholders cannot be overemphasised. The lecturers for the vocational training institutions are important as they are the ones who impart the life-long training that should include sustainability literacy. All the vocational training institutions that are registered with the World Technical and Vocational Education and Training database and are situated within the study area, were targeted. These included Harare Polytechnic College, Bulawayo Polytechnic College, Msasa Industrial Training College, Westgate Industrial Training College and St Peters Kubatana Technology Centre. While the Polytechnic Colleges enrol students according to the minimum academic requirements of five ordinary level subjects including Mathematics and English, Industrial training centres are more expansive, with the

ability to read and write is the entry requirements. This difference in entry requirements has the potential to contribute to differences in perception within the study area.

The NEC is responsible for benchmarking productivity outputs and regulates the conditions in which these are set. The NSSA and EMA inspectorate are relevant in that they deal with social, environmental and economic issues within the construction industry and as such, they will be able to contribute, through their perception, on these sustainability dimensions and their significance in the labour productivity improvement initiative. NAMACO is tasked with innovations in manpower requirements across all industries and more specifically the construction industry where they endeavour to make breakthroughs within the sustainability dimensions. All these respondents were allowed to respond to the sustainability indicators for sustaining labour productivity performance. For the selection of current construction projects, purposive solicitation from the National Social Security Association (NSSA) and City and Town councils were necessary as they have the records of current projects within their jurisdictions. The construction projects were limited to those in Harare, Bulawayo, Zvishavane and Shurugwi.

Table 4.2: Targeted Respondents

Respondents Group	Respondents Population	Targeted Respondents
Construction Companies	<ul style="list-style-type: none"> Construction companies registered with CIFOZ Construction projects in Bulawayo, Harare, Zvishavane, Shurugwi and Ngezi 	<ul style="list-style-type: none"> Site Managers/ Project Managers and Training Managers Skilled Workers (Specified trades represented)
Technical and Vocational Training Institutions	<ul style="list-style-type: none"> Harare Polytechnic College Bulawayo Polytechnic College Msasa Industrial Training College Westgate Industrial Training College St Peters Kubatana Technology Centre 	Lecturers of technical and vocational courses (Specified trades represented)
Regulators and Educators	<ul style="list-style-type: none"> National Employment Council for the Construction Industry National Manpower Advisory Committee National Social Security Authority Environmental Management Agency 	<ul style="list-style-type: none"> Inspectorate (Harare and Bulawayo) Committee members on Construction Manpower Development Inspectorate (Harare and Bulawayo) Inspectorate (Harare and Bulawayo)

4.5 DATA COLLECTION METHODS

4.5.1 Quantitative method

Quantitative data was collected through questionnaires and interviewer-administered questionnaires. Questionnaires are used for descriptive and explanatory studies (Saunders,

Lewis & Thornhill, 2016: 439), similar to this study, where relationships between various variables need to be established. Several related studies have utilised this survey method due to its ability to withdraw quantitative data from large populations within a reasonably short space of time (Kaming *et al*, 1997: 33; Makulsawatudom & Emsley, 2001: 281; Alwi, 2003: online; Kadir *et al*, 2005: 42; Alinaitwe, Mwakali & Hansson, 2007: 169; Enshassi *et al*, 2007: 358; Jergeas, 2009: online; Adamu *et al*, 2011: 9; Ameh & Osegbo, 2011: 56; Durdiev & Mbachu, 2011: 18; Jarkas & Bitar, 2012: 1070; Chigara & Moyo, 2014: 57). As already mentioned, questionnaires were utilised to collect quantitative data from construction companies, vocational training institutions, educators and regulators. Site Managers / Project Managers were specifically targeted from these companies, lecturers of specified trades from training institutions, inspectorate managers and principal researchers from authorities and councils. These questionnaires took the form of hand-delivered and collected questionnaires and e-mailed questionnaires. Interviewer-administered questionnaires were utilised to collect data from skilled workers and semi-skilled workers as their level of education may be a deterrent to the use of delivered or emailed questionnaires (Saunders, Lewis & Thornhill, 2016: 440, 441). Therefore, the researcher used the interview process to withdraw the required responses despite the language or literacy impediments.

4.5.2 Instrument design

The purpose of the questionnaire was to collect both qualitative and quantitative data from construction companies, vocational training lecturers, inspectorate of NSSA, EMA, NEC and NAMACO members. A structured questionnaire, with definite and pre-determined questions (Kothari, 2009: 101), was envisaged, with both open-ended and close-ended questions depending on the research question being addressed. Formats that include rating scales, 5-point Likert scales and ranking scales were utilised within the questionnaires. The questionnaire was in five sections; Profile of respondents, corporate labour social responsibility strategies, people-centred management aspects, sustainability literacy through technical and vocational training, sustainability literacy through on-the-job training schemes, decent working conditions and sustaining construction labour productivity performance. Interviewer-administered questionnaires were undertaken with skilled and semi-skilled workers. Questions were presented in the same order and wording to all interviewees (Naoum, 2007: 69) and all the research questions, except on sustaining construction labour productivity performance, were addressed.

4.5.3 Instrument administration

Questionnaires were hand-delivered and emailed to construction companies, as all contact details are contained in the CIFOZ list, depending on accessibility. The sampling frame of site managers or project managers was required to respond to the questionnaires within the construction organisations. Challenges of accessing companies through e-mail were encountered where the email address was no longer functional and in such instances, hand delivery was the remedy. In Technical and Vocational Training institutions, lecturers were surveyed. In some instances, the local approvals took long and some lecturers were inaccessible. The researcher had to continuously visit these institutions until the respondents were accessed. Inspectors from NEC for the Construction industry, NSSA, EMA and the members of the NAMACO committee for construction activities were also surveyed. Challenges were encountered with EMA inspectors as the organisational processes were strenuous and access was only allowed through the managers and not directly with the inspectors. Interviewer-administered questionnaires were undertaken with skilled and semi-skilled workers within previously stated trades of bricklaying, painting, carpentry and joinery. The challenges encountered in administering these included language differences and illiterate semi-skilled workers. Interpreters were sought, with caution being taken and the researcher had to simplify some of the questions to get valid responses.

4.5.4 Types of Questions

All the questionnaires collected demographic information on variables that consisted of the age, gender, designation, educational levels and experience. Questionnaires for site/ project managers also included questions on the construction company's category and experience in the construction industry. Self-administered and emailed questionnaires predominantly consisted of Likert scale type questions and a few open-ended questions. The closed-ended questions were all 5-point Likert scales with an additional "unsure" option. Questions for descriptive and inferential analysis, for all objectives, requested respondents to rate level, extent, importance, significance and improvement of one variable towards another. For example, respondents were requested to rate the significance of indicators to sustaining construction labour productivity where: 1- not significant, 2- of little significance, 3- somewhat significant, 4- significant and 5- very significant. Interviewer administered questionnaires, for construction workers, only had close-ended questions that were similar to those for site/project managers, except for questions on the last objective of the significance of indicators for

sustaining construction labour productivity. Open-ended questions requested site/project managers, educators and regulators to comment on their understanding of the concepts under study and influence of working conditions on realistic productivity outputs. These questions were subjected to quantitative content analysis for interpretation of the contextual appreciation from those that are particularly crucial in advancing policies and regulating the construction industry

4.5.5 Pilot test for questionnaires

A pilot test is paramount before the actual data collection is implemented using the questionnaire. Blumberg, Cooper and Schindler (2008: 74) attest that a pilot test detects weakness inherent in the questionnaire and provide proxy data for the selection of a sample. In this study, the pilot test was used to strengthen the questionnaire as the data collection instrument so that sufficient, reliable and valid data was collected. Saunders, Lewis and Thornhill (2009: 597) further allude that the test will expose any challenges the respondents will face in answering the questions that may arise from the questionnaires. A pilot study was undertaken with a sample of a total of 63 respondents representing 25% of the minimum targeted respondents of 250, for this study to be valid. The response rate for participation was 76.2%, as shown in Table 4.3.

Table 4.3: Response rate for the pilot study

Item	Respondent	Targeted	Actual	Response rate
1	Site Manager/Project Manager	20	16	80%
2	Skilled workers (Bricklayers, carpenters and Painter)	20	16	80%
3	Semi-skilled workers (Bricklayers, carpenters and Painter)	8	6	75%
4	Educators and Regulators	15	10	66.7%
	Total	63	48	76.2%

Respondents highlighted their concerns, through discussions, after the pilot survey was conducted. These concerns included: allotted time of 30 minutes was deemed insufficient with most suggesting that 45 to 60 minutes would suffice to complete the questionnaires, and simplification or addition of notes for some words was recommended for the respondents to easily understand the context of the questions. These concerns were addressed after consultation with the promoter and co-promoter.

For interviewer-administered questionnaires, qualitative questions were responded to with much difficulty, especially for semi-skilled workers. Simplification was undertaken with some of the questions being adjusted to close-ended questions. Added to that, the survey period varied greatly with participants due to the level of education of the respondents, however, all respondents were accommodated. The use of vernacular languages also assisted greatly in articulating the questions.

A pilot study considered the internal validity of the instruments by testing their reliability. Thus, the Cronbach Alpha test was applied and all the test items were considered reliable as they ranged between 0.7 and 0.90 as suggested by Tavakol and Dennick (2011: 54). This allowed for adjustments on the presentation and sequence of the tests to improve the instruments in preparation for a larger population. This exercise proved valuable to enhancing the validity and reliability of this study as shown in Table 4.4 where higher Cronbach alpha test results were realised for some test items.

Table 4.4: Cronbach alpha test results for Pilot study

Variable	Test Items	Cronbach alpha result	Interpretation
Corporate social responsibility strategies	13	0.862	Reliable
People-centred management aspects	15	0.886	Reliable
Sustainability learning objectives for training of skilled workers	15	0.868	Reliable
Sustainability learning objectives for on-the-job training of semi-skilled workers	12	0.870	Reliable
Decent working conditions	7	0.799	Reliable
Performance indicators	26	0.817	Reliable

4.5.6 Data processing

Data processing of the quantitative data and qualitative data collected through both questionnaires and interviewer-administered questionnaires entailed editing, coding and entry.

1. Editing- Data editing ensured consistency across respondents and location of omissions (Blumberg, Cooper & Schindler, 2008: 75). These were then corrected so that the data collected was accurate, consistent and complete (Kothari, 2009: 122). Central editing of the questionnaires was done and the following issues, as suggested by Kothari (2009:122), ensured;

- In cases of missing replies, the editor contacted the respondent for clarification and the respondent offered the appropriate answer.

- In cases where an answer to an open-ended question was missed, the editor would consult the respondent and where the respondent could not appropriately respond an “unsure” entry is done.

2. Coding- Kothari (2009: 123) describes coding as a process of categorising responses by assigning numerals or symbols. It is essential for an effective analysis hence the designed questionnaire was pre-coded with numerals assigned to the response categories. This was utilised for all the collected questionnaires. Pre-coding was done to enhance the consistency of the process (Saunders, Lewis & Thornhill, 2016: 506). For the open-ended questions, coding was done by two coders independently as further explained in its validity discussion.

3. Entry- All quantitative data was captured first on an excel spreadsheet and then through the Statistical Package for Social Sciences (SPSS) version 24, by the researcher for analysis. A statistician checked the entries and undertook all the statistical inferences to ensure validity and competence. Data matrices were utilised to enter the quantitative data according to the various data variables, with backups being saved (Saunders, Lewis & Thornhill, 2016: 503). Checking for errors is also important and it entails ascertaining that illegitimate codes were amended through verification with the primary documents (Saunders, Lewis & Thornhill, 2016: 509).

4.6 DATA ANALYSIS

Owing to the nature of the collected numerical and textual data, both quantitative and qualitative analysis was conducted in this study.

4.6.2 Qualitative data analysis

Saunders, Lewis and Thornhill (2016: 568) state that qualitative data is predominantly non-numeric and cannot be quantified. However, specific to this study, quantitative content analysis was utilised as it systematically examined responses that allowed for the identification of predefined words and terms (Boetgger & Palmer 2010: 349; Saunders, Lewis & Thornhill, 2016: 609). The aim was to contextualise the phenomenon of construction labour productivity’s incorporation of sustainability dimensions due to the potential proficiency differences of respondents. The steps to quantitative content analysis utilised in this study, as highlighted by Elo and Kyngas (2007: 110) and Boetgger and Palmer (2010: 349) include;

- selection of textual data from the questionnaires as analysable data

- the context within which to make sense of the data, these were keywords or terms that were expected
- identify the presence and frequency of specific words
- descriptive statistics and correspondence comparison to earlier studies

In this study, a few open-ended responses from site/project managers, educators and regulators were analysed and these contributed to the general conclusions. The analysis was aided by the use of ATLAS.ti version 8.0, where keywords and phrases were coded with predetermined responses.

4.6.1 Quantitative data analysis

This is the processing of raw data to explore, present, describe and examine relationships and trends (Saunders, Lewis & Thornhill, 2009: 414). Naoum (2013: 93) describes the two methods in which quantitative data analysis is undertaken as a descriptive method of analysis and inferential statistical method of analysis. This study utilised both these methods. The analysis was undertaken through the use of Statistical Package for Social Science (SPSS) version 24.

4.6.1.1 Descriptive analysis

Naoum (2013: 97) remarks that this is the simplest method of analysis, which gives an idea of what will be happening and will analyse either as percentages or as actual numbers. Leedy and Ormond (2013: 283) support the use of means and medians as measures of central tendency. Further to this, the mean was used due to it being mostly used in statistical analyses while the median was advantageous where the data set was highly skewed by being a better reflection of central tendency. Thus, means and medians were part of the analysis in this study. Consequent to this, the ranking was undertaken to base on the means (Naoum, 2013: 89). However, in instances where responded rated more than one variable, correspondence analysis, as explained in section 4.6.1.2, was first applied to the data before means and medians were calculated. The descriptive analysis also contributed to the general conclusions of the study.

4.6.1.2 Inferential analysis

Naoum (2013: 104) exposes that inferential statistics are utilised to compare the results of different parts of the sample. The author further outlines the steps in undertaking inferential statistical tests and this includes setting the significant levels. All inferential analysis in the study was verified by a statistician.

Normality tests

Ghasemi and Zahediasl (2012: 486) state that the Kolmogorov-Smirnov (K-S) test and the Shapiro-Wilk (S-W) test are used to test normality where a non-significant result (sig value > 0.05) indicates normality. They further relay that these tests are recommended for a sample size of less than 50. However, the Shapiro-Wilk test takes precedent as supported by Razali and Wah (2011: 30), for samples greater than 50, as this test is always more sensitive compared to the K-S test. Where the result is below 0.05, non-parametric tests that include the Pearson chi-squared test, Mann-Whitney U test and the Kruskal Wallis test were utilised. Where the result was above 0.05, parametric tests that include Pearson bivariate correlation method and regression analysis were utilised.

Ranking and Correspondence analysis

Naoum (2013: 89) refers to the ranking is a product of data that has been collected through an ordinal scale was the respondents' rate a response according to a number that represents their attitude, opinion, perception or preference. Therefore, data that were collected through a 5-point Likert scale was ranked according to the perception on the extent of influence or relationship between two variables, according to the mean ratings. The mean ratings were evaluated to ascertain the most significant predictor variables. However, it is erroneously perceived that Likert scales intervals are equidistant (Yelland, 2010: 2), hence re-scaling must be undertaken through correspondence analysis. This is undertaken after the data were collected from the respondents. Thus, correspondence analysis was utilised to re-scale the 5-point Likert scale from ordinal to interval data (Nkado & Meyer, 2001: 485). The re-scaled ratings were thus utilised as an evaluation scale for the significance of variables.

Pearson Chi-squared test

Contributions from the varied construction actors were brought together and correspondence analysis was undertaken to re-scale the data to interval data and synthesised to unearth significant variables through a Chi-squared test. This test was used for goodness of fit (Kothari, 2009: 236), where the divergence between the expected significant outcome and the observed outcome is established and the significant variables were selected with the parameters set at 5% level of significance. Further to this, Cramer's statistic was utilised to measure the size of the association between the dependent and independent variable. The highest Cramer value, between 0 and 1, was considered to have the highest significance (Field, 2014: 743). Further to that, significance was set at $p < 0.05$.

The strength of the association was set as: between $0 \leq v < 0.1$ (little association); $0.1 \leq v < 0.30$ (low association); $0.30 \leq v < 0.50$ (moderate association) and $v \geq 0.5$ (high association) (Field, 2014: 743).

Mann-Whitney U test

Blumberg, Cooper and Schindler (2008: 670) defines a Mann-Whitney U test as a non-parametric test used for ordinal data where two independent samples' means are determined as equal or not. Differences in opinion between construction site managers that include site managers and project managers, and construction skilled workers must be ascertained. Thus, the Mann-Whitney test was utilised to achieve this. This enabled a holistic analysis to be undertaken and the generation of specific and accurate results concerning the construction industry as a whole. It also allowed necessary specific attention to be operationalised with regards to the independent samples. Where the Kruskal-Wallis test showed the statistically significant difference in the combined perceptions on the significance of dependent variables, to establish where the significant differences lie across the different independent variables a post-hoc Mann-Whitney test U was utilised. In such instances, Osei-Kyei and Chan (2017: 32) support the use of the Mann-Whitney U test on the significant strategies using a re-calculated alpha value based on the number of combinations of the independent variables. Field (2014: 225) states that the Mann-Whitney U test interpretation, in post-hoc analysis, relies on scores being ranked from lowest to highest; thus, the lowest mean rank is the group with the greatest number of lower scores.

Kruskal- Wallis one-way analysis of variance

Kothari (2009: 298) describes the Kruskal-Wallis one-way analysis of variance as a non-parametric test that is used to test the null hypothesis that more than two independent random samples come from identical universes against the alternative hypothesis that their means are not equal. This method was used to ascertain consensus from the different respondent groups of the different trades of skilled workers and the multi-stakeholders (construction site management, vocational training lecturers, training managers and construction skilled workers. This established if there was demographic consensus from these groups on their views about the corporate social responsibility strategies, people-centred management aspects, sustainability literacy through vocational training and on-the-job training schemes and decent working conditions that should be used to ensure the social

protection of workers, good workplace relations, adequate productive work, ensuring a safe working environment and productivity improvement respectively.

Pearson bivariate correlation method

Field (2014: 267) describes bivariate correlation as a correlation between two variables. This method was used to determine the relationships between the rankings of statistical indicators and the demographical variables of respondents (Shayib, 2013: 239). Further to that, the size of the effect was examined on the following scale: +/- 0.1 represents a small effect, +/- 0.3 represents a medium effect and +/- 0.5 is a large effect (Field 2014: 270). Statistical significance of the correlation was set at 5% meaning that a p-value of < 0.05 shows a significant correlation (Shayib, 2013: 239). The correlation coefficient indicates the strength of the linear relationship between two variables (x and y).

Regression analysis

Regression analysis is fitting a linear model to our data and use it to predict the values of a dependent variable from one or more dependent variables (Field 2014: 298). The linear relationship between a dependent variable Y and *i* independent variables is described as:

$$Y = \alpha_1 X_1 + \alpha_2 X_2 + \alpha_3 X_3 + \alpha_4 X_4 + \alpha_5 X_5 + \alpha_6 X_6 + \dots + \alpha_i X_i + \beta \quad (\text{Shayib, 2013: 240})$$

Where: The parameter α_i represents the expected change in response Y per unit change in X_i when all the remaining independent variables are held constant. The relationship between the substantive elements aggregated statistical indicators, and the demographics were set using regression analysis for the significantly correlated variables. The effect of the sample size was set at: $R^2 = 0.02$ (small), 0.13 (medium) and 0.26 (large) and significance of the model and coefficients at $p < 0.05$ (Field 2014: 313, 318).

Reliability of statistical data

Cronbach alpha reliability test was undertaken, with Taherdoost (2016: 33) describing it as the extent to which a measurement of a phenomenon provides stable and consistent results. George and Mallery (2003: 53) provide the following rules of thumb: > .9 - Excellent; > .8 - Good; > .7 – Acceptable; > .6 – Questionable; > .5 – Poor, and < .5 – Unacceptable for interpreting Cronbach's alpha coefficients. Reliability analysis was undertaken for all the test items within all the objectives of the study and was all acceptable with varying interpretations from acceptable to excellent as shown in Table 4.5.

Table 4.5: Cronbach alpha test results for the main study

Variable	Test Items	Cronbach alpha result	Interpretation
Corporate social responsibility strategies	13	0.807	Good
People-centred management aspects	15	0.747	Acceptable
Sustainability learning objectives for training of skilled workers	15	0.910	Excellent
Sustainability learning objectives for on-the-job training of semi-skilled workers	12	0.930	Excellent
Decent working conditions	7	0.827	Good
Performance indicators	26	0.831	Good

4.6.3 Treatment of hypotheses

The treatment of each research hypotheses is presented in Table 4.6 with the variables emphasised. Therefore, treatment of quantitative data was limited to the methods outlined.

Table 4.6: Treatment of specific hypotheses

Hypothesis	Variables	Analysis
Hypothesis 1.1	Significance of corporate social responsibility strategies on social security of workers	Pearson chi-squared test and Ranking
Hypothesis 1.2	Ranking of corporate social responsibility strategies Versus Demographic variables: generation (age), gender, designation, educational levels and experience	Mann-Whitney U test, Kruskal Wallis test
Hypothesis 2.1	Significance of people-centred management aspects on adequate employment treatment of construction workers	Pearson chi-squared test and Ranking
Hypothesis 2.2	Ranking of people-centred management aspects Versus Demographic variables: generation (age), gender, designation, educational levels and experience	Mann-Whitney U test, Kruskal Wallis test
Hypothesis 3.1	Significance of sustainability learning objectives on adequate productive work of construction skilled workers	Pearson chi-squared test and Ranking
Hypothesis 3.2	Ranking of sustainability learning objectives Versus Demographic variables: generation (age), gender, designation, educational levels and experience	Mann-Whitney U test, Kruskal Wallis test
Hypothesis 4.1	Significance of sustainability learning objectives on safe working environments for semi-skilled workers	Pearson chi-squared test and Ranking
Hypothesis 4.2	Ranking of sustainability learning objectives Versus Demographic variables: generation (age), gender, designation, educational levels and experience	Mann-Whitney U test, Kruskal Wallis test
Hypothesis 5.1	Significance of decent working conditions on improving construction labour productivity of construction workers	Pearson chi-squared test and Ranking
Hypothesis 5.2	Ranking of decent working conditions Versus Demographic variables: generation (age), gender, designation, educational levels and experience	Mann-Whitney U test, Kruskal Wallis test
Hypothesis 6	Comprehensive statistical indicators for sustaining construction labour productivity performance Versus Demographic variables: generation (age), gender, designation, educational levels and experience	Pearson bivariate correlation method, Regression analysis

4.6.4 Reliability of the study

Babbie and Mouton (2015: 119) describe reliability as a matter of ensuring that the same results are yielded when the same technique is applied repeatedly to the same object. In agreement, reliability was attained when the research tools gave us the same results when repeated data collection was done when everything else was constant.

Reliability of quantitative data

Saunders, Lewis and Thornhill (2016: 451) suggest three forms of ascertaining reliability; test and retest, internal consistency and alternative form. However, due to the length of the questionnaire, calculating internal consistency was utilised in this study. Brown (2002: 17) supports the use of the Cronbach alpha reliability estimate in testing for internal consistency and this test was utilised for acceptable internal consistency of questionnaires items. Added to this, the use of questionnaires and interviewer-administered questionnaires has been reliable in previous construction productivity researches hence these are established measures that were used (Babbie & Mouton, 2015: 122). Initially, the questionnaire underwent measurement for internal consistency to ensure that they were homogenous through a pilot study. Test and re-test were not utilised due to it requiring the same questionnaire to be completed twice by the same respondent after a specific time interval (Saunders, Lewis & Thornhill, 2016: 451). This was due to time constraints and potential conflict with respondents. The alternative form, which utilises check questions for ascertaining reliability (Saunders, Lewis & Thornhill, 2016: 452) was not also used due to the difficulty to ensure equivalence of questionnaire and the length of the questionnaire.

Reliability of qualitative data

Reliability of quantitative content data analysis was ensured by the use of multiple coders and ATLAS to version 8. Krippendorff (2004: 215) suggests that the reliability of qualitative data is assured if the coders follow explicit and communicable instructions and work independently from each other. Added to that, percentage of agreement was used expected values being > 80% Krippendorff (2004: 241), which is accurate for few categories (Bolognesi, Pilgram & Van der Heerik, 2016: 1988). Textual data from open-ended questions were analysed by two coders, who worked independently for the main survey.

4.6.5 Validity of the study

Gray (2009: 155) states that assurance of validity is achieved when a research instrument adequately measures what it is supposed to measure. Babbie and Mouton (2015: 122)

reiterate by stating that it refers to “the extent to which an empirical measure adequately reflects the real meaning of the concept under consideration”.

The validity of quantitative data

Creswell (2013: 251) infers that a researcher must make decisions about what is salient to study, relevant to the purpose of the study and interest. Saunders, Lewis and Thornhill (2016: 450) describe internal validity with regards to questionnaires as its ability to measure what you want it to measure. They further relay content validity as being important for questionnaire surveys. Content validity was achieved through pilot testing the questionnaire ensured adequate coverage of the main questions under study (Saunders, Lewis & Thornhill, 2016: 450). Further to this, the selection of relevant respondents who possessed the required knowledge was undertaken with their demographic variables that included age, gender, designation, educational levels and experience being considered vital to comprehensively address the issues at hand. External validity was also achieved so that the primary data can generalise to a larger population and this was ensured by the use of statistically competent sample size (Gray, 2009: 157). This survey attracted a total of 167 participants with more than 75% response rates and hence competent statistical analysis and generalisation of findings was supported. Reporting on negative analysis was also pertinent to achieving validity as a realistic assessment was exposed (Creswell, 2013: 251) hence all phenomenon was adequately addressed from balanced perspectives.

The validity of qualitative data

The validity of data was ensured by considering how the available evidence and theory support the findings (Krippendorff, 2004: 315). Elo and Kyngas (2007: 112) further relay that the credibility of research findings is strengthened by the resemblance of the codes to theory. Therefore, empirical validity was utilised in the study. This considered the reviewed literature on understanding corporate social responsibility, sustainability literacy and construction labour productivity performance and its need for codification and analysis.

4.7 ETHICAL CONSIDERATIONS

Gray (2009: 69) refer to upholding research ethics as going beyond adopting the most appropriate methodology, to researching a responsible and morally defensible way. Ethical issues are prevalent throughout the whole research process and it is pertinent that they are addressed as and when they surface (Creswell, 2013: 56). Ethical principles, according to Gray (2009: 73), within this study, broadly: avoided harm to participants; ensured informed

consent of participants; respected the privacy of participants; and avoided the use of deception. This study gleaned from Creswell (2013: 58,59) by expanding on the research process stage and preventative action plan as follows:

- **Prior to Conducting research**

Nelson Mandela University research ethics committee approval was sought and granted, clearance number referenced as H18-ENG-BQS-001. The application process involved an evaluation of the research methodology and data collection instruments, amongst other aspects. Permission from the Ministry of Higher and Tertiary Education, Science and Technology, NSSA, NEC, EMA and NAMACO was sought after ethical clearance was granted, and all were also granted. Local permission from site and participants was also sought and granted. Selected sites had no vested interest in the outcome of the study, the purpose of the study was disclosed to the participants, participants were not pressured into signing consent forms and aspects and charters of societies were respected.

- **Collecting data**

During the collection of data, the researcher respected the site and minimised disruptions and avoided deceiving participants. This was achieved through building trust, conveying the extent of anticipated disruptions and informing how data was to be used. The researcher also underwent induction training on sites to appreciate the existent processes and also communicate to the respondents the importance of decent work training. There were challenges in collecting data and these included semi-skilled construction workers who faced difficulty in understanding the aspects under study. These were excluded from the study. There were also minor communication difficulties due to dialect differences but these were easily resolved through conversant site personnel.

- **Analysing data**

To ensure analysis of data was done competently the researcher avoided siding with participants, avoided disclosing unbalanced results and respecting the privacy of participants. Assurance of this entailed reporting multiple perspectives and contrary findings and assigning fictitious names and developing composite profiles. All data that was analysed by the additional coder and statistician was anonymous.

- **Reporting data**

Utmost care was taken to ensure that data and findings were not falsified, plagiarism not done, information that would harm participants not disclosed and communication done in clear unambiguous English. Thus, the researcher reported honestly, used composite stories for concealing identification and used language appropriate for the audience of the research.

- **Publishing study**

The researcher shared and will continue to share with others, not duplicate or piecemeal publications, complete proof of compliance with ethical issues and ensure lack of conflict of interest. This was and will be achieved through providing copies of conference or journal articles to participants where possible, refraining from using the same material for more than one publication and disclose funders and those that will profit from the research

4.8 CHAPTER SUMMARY

Positivism was selected as the philosophical foundation for this study. This philosophy culminated in the use of the deductive approach. This approach required the operationalisation of the quantitative method. A cross-sectional survey research strategy was extended with quantitative data being drawn from selected respondents through the use of questionnaires. The population for the study consisted of construction companies registered with the Construction Industry Federation of Zimbabwe and based in Harare, Bulawayo and Shurugwi, construction skilled and semi-skilled workers on thirteen (13) construction sites situated within the same study area. Educators from technical and vocational training institutions and regulators from the National Employment Council of the construction industry, National Social Security Authority, Environmental Management Agency and National Manpower Advisory Committee. Random sampling was utilised to select construction companies and from these site or project managers were targeted to participate. Also, all skilled and semi-skilled construction workers from the different classes were invited to participate.

Self-administered and e-mailed questionnaires were utilised for site managers, project managers, educators and regulators in construction companies and on construction sites. Interviewer-administered questionnaires were utilised for skilled and semi-skilled workers on construction sites. Quantitative data analysis selected various methods through the use of Statistical Package for Social Science version 24 and the methods included: Cronbach alpha reliability tests; normality tests; Pearson chi-squared tests; ranking and correspondence analysis; Mann-Whitney U tests; Kruskal-Wallis tests; Pearson bivariate correlation method and Regression analysis. Open-ended questions were analysed through content analysis. Content analysis was aided by the use of ATLAS.ti 8 version 8.0, for the few open-ended questions in the questionnaires.

CHAPTER 5: FINDINGS, DISCUSSION AND HYPOTHESES TESTING

5.1 Introduction

This chapter reports on the presentation, analysis and discussion of empirical data withdrawn from all respondents through self-administered questionnaires, emailed questionnaires and interviewer-administered questionnaires. The initial section captures the response rate and demographics of all participants. After the data were processed, quantitative data were analysed using SPSS version 24 and the hypotheses for each objective were tested. Correspondence analysis and test for normality were undertaken for each objective to determine whether parametric or non-parametric tests were suitable for the consequent hypotheses testing for each objective.

5.2 Response rate

The survey achieved a response rate of 79.4% for site/project managers, 78% for regulators and educators and 77.9% for skilled and semi-skilled workers, as shown in Table 5.1. Johnson and Owens (2013: 132) stated that, though no formal policies existed regarding minimally acceptable response rates, it was generally indicated that response rates of less than 60% rarely get accepted for publication in journals. Baruch (1999: 430) also suggests a response rate of 60% with a standard deviation of 20% as a standard norm for populations of employees, managers or professionals. Thus, an overall response rate of 78.4% is acceptable and supports generalisation of results. This is comparable to other related studies on productivity that include Murray and Cotgrave (2007:15), Jarkas, Radosavljevic and Wuyi (2014: 1078) and Ghoddousi, Poorafshar, Chileshe and Hosseini (2015: 816) when they achieved a response rate of 72%, 71% and 56% respectively.

Table 5.1: Response Rate

Respondent Group	Population	Sample Size	Responses	Response Rate
Site Managers/ Project Managers	83	68	54	79.4%
Regulators and Educators	41	41	32	78%
Skilled and Semi- Skilled Workers	142	104	81	77.9%
Total		213	167	78.4%

5.3 Demographics of Participants

The survey considered the demographics of all the participants as this contributed to the validity of the study and was important in satisfying the requirements of the objectives of

the study. Thus, the age, gender, designation, educational level and experience of respondents was initially presented and interpreted. Further to that, pertinent qualitative and quantitative characteristics of the respondents were also considered.

5.3.1 Generation (Age) of respondents

Table 5.2 shows the generation of the respondents which is dispersed within the different age groups; Baby Boomer (1946 -1964), Generation X (1961 -1980), Generation Y (1981 – 1994) and generation Z (1995 – present). The distribution shows that Generation Y (50.3%) and Generation X (47.3%) were the most represented age groups translating to ages of 24 to 51 years. The oldest generation, Baby boomer, aged between 52 and 72 years and the youngest age group, Generation Z, aged less than 24 years are both scarcely represented. This indicates the effects of skills migration which started at the onset of the millennium when this oldest generation sought employment across our borders (Chetsanga, 2003: 1: Mhlanga 2018: 12).

The advent of Generation Y as the most represented age group has the potential to contribute positively to the study and sustainable development agenda as Tolbize (2008: 2, 3, 4) reported that they embrace diversity, are adaptable to change and seek flexibility and balanced life. The Generation X age group also has similar characteristics as those required for driving sustainable development, for example, they value continuous training and skills development and they are pragmatic, creative, and may also like teamwork (Fernandes *et al.*, 2012: online). The younger generation's absence is due to scarcity of work that has limited employment to the less experienced, and these have in turn also migrated to other countries seeking employment.

Table 5.2: Age of respondents

Generation	Site/ Project Managers	Skilled Workers	Semi-skilled workers	Regulators and Educators	Totals
Baby Boomer	1 (2%)	-	1 (2.3%)	1 (3%)	3 (1.8%)
Generation X	13 (24%)	23 (62.2%)	18 (40.9%)	25 (78%)	79 (47.3%)
Generation Y	39 (72%)	14 (37.8%)	25 (56.8%)	6 (19%)	84 (50.3%)
Generation Z	1 (2%)	-	-	-	1 (0.6%)
Totals	54 (100%)	37 (100%)	44 (100%)	32 (100%)	167 (100%)

5.3.2 Gender of respondents

Table 5.3 shows that 86% of all the respondents are males and 14% are female. Though this may represent a skew in favour of males, it is a reflection of the representation in the construction industry which is gender-biased towards males (Magwaro-Ndiweni, 2016: 10).

The results show that the prerogative of the Zimbabwean government for gender-inclusive construction industry is still to be met (Government of Zimbabwe, 2014: 25).

Of significance is that semi-skilled workers have the most male proportion, and this indicates that fewer females choose the less formal training route of on-the-job training compared to their male counterparts. Nevertheless, all the respondent groups are adequately represented in the study.

Table 5.3: Gender of respondents

Respondent Group	Total Respondents	Male	Female
Site Managers/Project Managers	54	47 (87%)	7 (13%)
Skilled Workers	37	28 (75.7)	9 (24.3%)
Semi- Skilled Workers	44	41 (93.2%)	3 (6.7%)
Regulators and Educators	32	27 (84.4%)	5 (15.6%)
Total	167	143 (86%)	24 (14%)

5.3.3 Designation of respondents

The study sought various respondents who have direct and indirect influence within its confines. Table 5.4 shows that project managers were the most represented designation with 23.9% of the total respondents. This statistic emanates from most construction companies employing project managers despite not having current projects. Semi-skilled Bricklayers (11.95%) were also the most represented construction worker and this indicates it to be the most populated construction trade. All relevant designations were sufficiently represented in the study.

Table 5.4: Designation of respondents

Respondent Group	Total Respondents
Site Managers	14 (8.4%)
Project Managers	40 (23.9%)
Bricklayers Class 1 to Class 4	16 (9.6%)
Carpenter Joiner Class 1 to Class 4	11 (6.6%)
Painter Class 1 to Class 4	10 (5.95%)
Bricklayer Worker Exempted	20 (11.95%)
Carpenter Joiner Worker Exempted	12 (7.2%)
Painter Worker Exempted	12 (7.2%)
Technical and Vocational Lecturers	13 (7.8%)
Environmental Management Agency Inspectors	8 (4.8%)
National Social Security Authority Inspectors	4 (2.4%)
National Employment Council Inspectors	3 (1.8%)
National Manpower Committee Construction Unit Members	4 (2.4%)
Total	167 (100%)

The variability in the designation is bound to expose the inherent deficiencies in the training of white- and blue-collar workers and assist the development of targeted intervention strategies for the different designation of workers. This is supported by Ghai (2006: 91) then the author remarked that indecent work is greatest amongst the less educated.

5.3.4 Educational level of respondents

The expected varied educational levels were represented in the study as shown in Table 5.5. Generally, 35.3% of the respondents had degrees and 23.95% had no minimum ordinary levels. The degreed respondents were site/project managers, regulators and educators and this is consistent with the quality of responses required in the study. Those with no minimum ordinary levels were all semi-skilled workers, whose training is site-based, and there is no requirement of minimum qualifications before commencement of training and work. Thus, the diverse educational levels are well represented in the study.

The presence of these diverse educational qualifications, however, aids the endeavour of the study. ILO (2018e: 22) report that the lack of skill is a substantial contributor to decent work concerns in the construction sector. Therefore, the lower the education levels the lesser is expected in terms of decent work aptitude. However, since ILO (2018: 61) also highlight that participation in education and training of workers is a requisite for sustainable development, the educational levels in this context should be considered together with sustainable development literacy in the requisite training for it to be effective.

Table 5.5: Educational level of respondents

Educational Level	Site/Project Managers	Skilled Workers	Semi-skilled Workers	Regulators and Educators	Totals
No Minimum Ordinary Levels	-	-	40 (90.9%)	-	40 (23.95%)
Minimum Ordinary Levels	-	-	4 (9.1%)	-	4 (2.35%)
National Certificate	-	36 (97.3%)	-	3 (9.4%)	39 (23.4%)
National Diploma	15 (27.8%)	1 (2.7%)	-	9 (28.1%)	25 (15%)
Degree	39 (72.2%)	-	-	20 (62.5%)	59 (35.3%)
Totals	54 (100%)	37 (100%)	44 (100%)	32 (100%)	167 (100%)

5.3.5 Experience of Respondents

Table 5.6 shows that most of the respondents (35.9%) have 6-10 years of work experience. While the least represented range of work experience is 11-15 years with 19.2% of the respondents. A considerable 20.95% of the respondents have more than 15 years' work

experience in the construction industry whilst 23.95% have between 1-5 years' work experience. Generally, the work experience survey results sufficiently include all the age ranges and that is relevant towards ascertaining the validity of this study (Ulubeyli, Kazaz & Er, 2014: 16).

Of particular interest is the potential contribution to the study concerning sustainable development. Contrary to the norm that the most experienced respondents add the most value to a study, this context requires deeper analysis as the absence of sustainable development literacy in earlier curricula or even awareness programmes potentially rendered the most experienced group requiring the most intervention (Murray & Cotgrave, 2007: 20). The least experienced however have contributed the most to employee safety concerns (Mhlana, 2018: 12).

Table 5.6: Experience of respondents

Experience	Site/Project Managers	Skilled Workers	Semi-skilled Workers	Regulators and Educators	Totals
1-5 Years	14 (26%)	7 (19%)	12 (27.3%)	7 (21.8%)	40 (23.95%)
6-10 Years	24 (44.4%)	8 (21.6%)	16 (36.4%)	12 (37.5%)	60 (35.9%)
11-15 Years	10 (18.5%)	8 (21.6%)	4 (9%)	10 (31.3%)	32 (19.2%)
More than 15 Years	6 (11.1%)	14 (37.8%)	12 (27.3%)	3 (9.4%)	35 (20.95%)
Totals	54 (100%)	37 (100%)	44 (100%)	32 (100%)	167 (100%)

5.3.6 CIFOZ category of contractor

The survey managed to collate data from 5 of the 7 contractor categories embodied within the study area. Table 5.7 shows that 55.6% of the contractors were in category A. This is the highest category and such a high representation aids to the validity of the study. The smaller contractors are sparingly represented with category H having 1.9% and this is due to the absence of the appropriate respondents within their organisations.

The CIFOZ categories are reflective of certain organisational, technical and financial traits where category A companies are the most organisationally and technically competent, and financially stable. Therefore, having 55.6% category A companies and 5 of the 8 categories represented, a strong representation of all construction companies is achieved within the study

Table 5.7: Contractor participants

Category	Number (%)
Category A	30 (55.6%)
Category B	8 (14.8%)
Category C	7 (12.9%)
Category D	8 (14.8%)
Category H	1 (1.9%)
Total	54 (100%)

5.3.7 Contractors' experience

Contractors were requested to indicate their experience in the construction industry, and most of the companies (66.7%) had 11-15 years' experience, as shown in Table 5.8. The advent of the Indigenisation Act in the first decade of the millennium led to the older construction companies closing and a considerable number of these companies renaming under new leadership (Mhlanga, 2017: online). Thus, the distinct experience range reflects such companies regenerating under a new legal and political dispensation.

Also, 24.1% of companies have 10 years and less experience. This is due to the liberalisation of the construction industry which has made it less difficult to set up construction companies. However, the validity of the study is aided by having most of the companies having considerable experience (11-15 years) and also by a representation of all the experience categories.

Table 5.8: Experience of Contractor

Experience	Number (%)
1-5 Years	5 (9.3%)
6-10 Years	8 (14.8%)
11-15 Years	36 (66.7%)
More than 15 Years	5 (9.3%)
Total	54 (100%)

5.3.8 Construction sites considered

Skilled and semi-skilled workers were sought from construction sites within the study area, as shown in Table 5.9. These sites were purposively sought through the NSSA register. The survey considered residential (46%) and commercial construction projects (54%). Thus, the type of sites represents the varied conditions the skilled and semi-skilled workers are exposed to and consequently their varied views on the critical aspects of the survey.

Table 5.9: Construction sites

City/Town	Residential construction project no.	Commercial construction project no.
Harare	4	4
Bulawayo	2	2
Shurugwi		1
Total	6(46%)	7 (54%)

5.4 CORPORATE SOCIAL RESPONSIBILITY STRATEGIES

Respondents were initially requested to comment on their understanding of various aspects associated with corporate social responsibility. This provided a critical appreciation of the current attitudes and aptitudes within this phenomenon. The results, analysis and interpretation from these interrogations are presented under each sub-heading.

5.4.1 Understanding of corporate social responsibility by site/project managers

Site/project managers were asked to comment on their understanding of corporate social responsibility. Of the 54 returned questionnaires, 48 (92.2%) of respondents had at least one comment while 6 (98.8%) did not comment. All the comments were collected as textual data and undertaken through meaning condensation, coded and categorised, as presented in Table 5.10 before inference was undertaken. ATLAS.ti 8 was utilised to aid analysis. Coding was undertaken by two coders and the agreement percentage was reliable at 81%. The coding and categorisation were aided by literature in section 3.3.1. The categorisation was derived from literature into aspects of sustainable development, corporate imaging and community participation. These were extended by Filho, *et al* (2010: 297), Matimba (2012: 14), and Bevan and Yung (2015: 309). Codification included Sustainable development (firm's responsibility, sustainable practices); Corporate imaging (business model and philanthropy); and community participation (technical assistance and voluntary commitment).

Table 5.10: Frequencies of codes for the understanding of sustainability literacy

Example of comment	Code	Count	Category	Frequency
Firm's responsibility to society	Firm' responsibility	25	Sustainable development	56.6%
Contribution to sustainability development by delivering economic, social and environmental benefits	Sustainability practices	18		
Social projects by companies	Business model	9	Corporate imaging	18.4%
Taking care of the needy	Philanthropy	5		
Assisting in development of tradesmen	Technical assistance	2	Community participation	25%
Voluntary obligation to society	Voluntary commitment	17		
	Total	76		100%

From the comments, site/project managers as drivers of organisational policy, seem to have a wide understanding to be able to push for its implementation. However, in the category of corporate imaging (18.4%), the responses are biased towards the benefits that the companies can accrue from implementing corporate social responsibility. In contrast, Chaneta (2013: 56) proffers corporate social responsibility as actions to promote workforce

diversity and actions to enhance employees' well-being and making the company a great place to work. This means companies' business models need to be tailored towards facilitating a wider spectrum of benefits. The lack of relation to workers reflects that typical respondents are not conversant with the contribution of corporate social responsibility towards uplifting the status of construction workers, even when enhancing the image of the company. As much as philanthropy enhances the company's image, it does not capacitate the community directly or indirectly (Kakava, Mbizi & Manyeruke, 2013: 679). There is inherent need to depart from companies seeking only to enhance corporate images through corporate social responsibility (Masuku & Moyo, 2013: 113) but to drive meaningful development initiatives (Msweli & Wushe, 2014: 15)

In the category of community participation (25%), the responses consider more of what companies can do for communities as corporate social responsibility. Dziro, (2014: 65) acknowledges that aspects of technical assistance and voluntary commitment do not relate much to the welfare of the workforce, thus create a dependence syndrome for communities. Construction workers must participate in any corporate social responsibility strategies initiated by their organisations as this empowers communities.

In the category of sustainable development (56.6%), the thrust of corporate social responsibility is most realised. Will (2008: 234) reports that respect for the carrying capacity of ecological and social systems is also important, as these have a consequential effect on workers. Matimba (2012: 15) and Zahid and Ghazali (2015: 101, 102) reiterate that corporate social responsibility should enhance economic, social and environmental aspects within communities and by communities. However, the limitation is placed on the responsibilities to those that may emanate from the business impact of the companies. Such responsibilities may not be sustainable hence there is need to expand the responsibilities to those that are beyond the business interests or emanate from business activities. The responses fully capture the requirements of companies to achieve sustainable development through corporate social responsibility strategies.

Generally, the responses are a positive reflection on-site/project managers as they play a substantial part in the implementation of any corporate social responsibility strategies that will benefit the workers and consequently the communities in which they dwell. However, understanding corporate social responsibility does not equate to actual implementation but rather an appreciation of its significance. Ideally, understanding needs particular attention in any long- or short-term intervention.

5.4.2 Understanding of corporate social responsibility by construction workers

Skilled workers and semi-skilled were also asked to indicate the extent of their understanding of corporate social responsibility, where 1- very low, 2- low, 3- average, 4- high and 5- very high. Only 23% of both skilled and semi-skilled workers have an average and above-average understanding of corporate social responsibility as shown in Table 5.11. A mean and median of two certify a low extent of understanding of both skilled and semi-skilled workers. Trade unions have to inform construction workers on these issues and learning objectives within their training can also enhance their understanding. If the workers have such considerable below-average understanding of corporate social responsibility, this is an echo of its limited existence within the Zimbabwean construction industry.

Table 5.11: Understanding of corporate social responsibility by construction workers

Description	U	1	2	3	4	5	Mean Score	Median
Understanding of corporate social responsibility by construction skilled and semi-skilled workers	0%	33%	44%	16%	4%	3%	2.00	2

5.4.3 Benefits from implementation of corporate social responsibility strategies

Site/project managers were requested to respond to the importance of benefits of corporate social responsibility strategies to their organisations where; 1- not important, 2- of little importance, 3- somewhat important, 4- important, 5- very important and U- unsure. Since it is erroneously perceived that Likert scales intervals are equidistant (Yelland, 2010: 2), re-scaling must be undertaken through correspondence analysis which re-scaled the 5-point Likert scale from ordinal to interval data (Nkado & Meyer, 2001: 485).

Table 5.12: Re-scaling of 5-point Likert Scale for rating importance of corporate social responsibility benefits

	Response	Axis 1 co-ordinate	Axis 2 co-ordinate	Euclidean Distance	Adjusted 5-point scale
1	Not important	-2.401	-0.108		1
2	Of little importance	0.096	-0.092	2.497	2.92
3	Somewhat important	-0.405	0.227	0.594	3.38
4	Important	0.401	0.654	0.912	4.08
5	Very important	0.294	-0.537	1.196	5

The results of the re-scaling, in Table 5.12, show that the ordinal ratings are not interval in nature and thus accurate interpretation will be achieved through the use of the re-scaled ratings. Furthermore, the nature of Euclidean distances represents a normal distribution.

The results in Table 5.13 show that enhanced brand image and reputation, with a mean score of 4.35, was the most important benefit experienced by construction companies and this corresponds to the assertion by Suliman and Abdelnaser (2009: 80). This is confirmed by Gond *et al.*, (2010: 12) when they reported that by companies implementing corporate social responsibility activities that enhance their image and reputation, prospective employees are also enticed to those companies.

Table 5.13: Benefits of implementation of corporate social responsibility strategies

Benefit	U	1	2	3	4	5	Mean	Rank
Enhanced brand image and reputation	0%	4%	2%	13%	26%	55%	4.35	1
Improved welfare and the wellbeing of workers	0%	6%	2%	13%	33%	46%	4.20	2
Enhanced stakeholder relations and credibility	2%	0%	0%	17%	47%	34%	4.19	3
Increased sales and customer loyalty	1%	2%	4%	19%	33%	41%	4.18	4
Increased customer satisfaction	1%	4%	6%	15%	30%	44%	4.15	5
Strengthened internal communication	1%	0%	11%	20%	35%	33%	4.08	6
Increased integration and alignment	1%	0%	13%	19%	37%	30%	4.03	7
Improved productivity and quality	3%	6%	6%	13%	28%	44%	4.02	8
Reduced operating costs	1%	6%	6%	22%	26%	39%	3.99	9

The benefit that was directly associated with workers was improved welfare and the wellbeing of workers with a mean score of 4.20, and enhancing this benefit, as supported by Maphosa (1998: 184), is fundamental for welfare of construction workers. Again, Wuttke and Vilks (2014: 121) infer that a positive impact in their internal working conditions is achieved, enhancing productivity.

5.4.4 Type of strategies implemented

Site/project managers were asked to indicate the extent of implementation of types of corporate social responsibility strategies, where 1- not at all, 2- to a little extent, 3- to some extent, 4- to a great extent, 5- to a very great extent and U- unsure. Since it is erroneously perceived that Likert scales intervals are equidistant (Yelland, 2010: 2), re-scaling must be undertaken through correspondence analysis which re-scaled the 5-point Likert scale from ordinal to interval data (Nkado & Meyer, 2001: 485).

Table 5.14: Re-scaling of 5-point Likert Scale for rating extent of implementation of corporate social responsibility types

	Responses	Axis 1 co-ordinate	Axis 2 co-ordinate	Euclidean Distance	Adjusted 5-point scale
1	Not at all	-0.548	1.637		1.00
2	To a little extent	-0.515	-0.99	2.627	3.06
3	To some extent	-0.527	-0.003	0.987	3.83
4	To a great extent	0.713	-0.076	1.242	4.80
5	To a very great extent	0.732	0.18	0.257	5.00

The results of the re-scaling, in Table 5.14, show that the ordinal ratings are not interval in nature and thus accurate interpretation will be achieved through the use of the re-scaled ratings. Furthermore, the nature of Euclidean distances represents positive skewness due to the majority of respondents rating the corporate social responsibility strategies moderately, as shown by the average mean of 3.80 in Table 5.15. All the means indicate that the types of strategies have been implemented to some extent. Fielding (2014: 20) describes positive skewness as having frequent scores clustered at the lower ends and is characterised by low means.

Table 5.15: Rating of types of corporate social responsibility strategies

Type of strategy	U	1	2	3	4	5	Mean	Rank
Pro-active	4%	9%	9%	19%	26%	33%	3.99	1
Reactive	4%	6%	9%	41%	28%	13%	3.90	2
Defensive	4%	7%	9%	37%	28%	15%	3.86	3
Accommodative	2%	13%	7%	37%	22%	19%	3.45	4
Average							3.80	

The results in Table 5.15 show 33% of respondents implementing pro-active corporate social responsibility strategies to a very great extent, 28% implementing defensive strategies to a great extent, 37% implementing accommodative strategies to some extent and 41% implementing reactive strategies to some extent. Whilst, Griffin (2013: 106) describes proactive strategies by companies as ways to seek opportunities to contribute, it would be worthwhile if consensus is reached in these aspects. However, proactive corporate social responsibility strategies that would ordinarily benefit workers have been sparingly implemented as shown by the mean of 3.99. Thus, intervention would be implemented to support strategies that benefit the construction workers and the communities within they operate.

The implementation of defensive strategies is appreciated, however, Ganescu (2012: 93) reports that these are chosen by a low level of innovation. D'Amato, Henderson and Florence (2009: 4) also confirm the limitation of these strategies as being reactive to

activists. Thus, a consistent and effective implementation would rather be undertaken through proactive strategies. Reactive and accommodative strategies are the least acceptable to drive the sustainable development agenda as these aid short term interests through adapting to stakeholders' immediate requests (Chang, 2015: 455).

5.4.5 Sub-question 1.1

What significant corporate social responsibility strategies lead most to improved construction skilled and semi-skilled workers' social security in Zimbabwe?

To satisfy the sub-question, the results, analysis of data, interpretation and hypothesis testing is undertaken hereafter

5.4.4.1 Results

5.4.4.1.1 Significance and ranking of corporate social responsibility strategies

Table 5.16: Significant of corporate social responsibility strategies

(N=135) (1= not significant 5= very significant)		Pearson Chi-square Test				
Rank	Strategy	Test Value	Degrees of freedom	P-Value	Cramer's V	Asymp Sig.
1	Train staff on ways to reduce environmental footprint	349.491 ^a	80	0.000	0.804	0.000
2	Offer outplacement services, retraining and severance benefits when closures and retrenchments are imminent	417.054 ^b	100	0.000	0.786	0.000
3	Train staff on the effects and need of minimisation of consumption of natural resources within their communities	248.459 ^c	60	0.000	0.783	0.000
4	Train staff on strategies to reduce emissions of hazardous substances and encouraging implementation in communities	217.583 ^d	60	0.000	0.733	0.000
5	Establish an environmental management system that transfers good practices to the communities	284.679 ^e	80	0.000	0.726	0.000
6	Offer quality work experience for construction trades students within local communities	253.619 ^f	80	0.000	0.685	0.000
6	Establish policies to ensure the well-being of all employees and the public	253.171 ^g	80	0.000	0.685	0.000
8	Extend training to life management, retirement planning and care of dependents	303.814 ^h	100	0.000	0.671	0.000
9	Encourage employee volunteering in the community with financial contributions and help in kind	222.058 ⁱ	80	0.000	0.641	0.000
10	Be open to flexi-time and other work-life balance policies for construction skilled workers	249.031 ^j	100	0.000	0.607	0.000
11	Zero tolerance to corruption, discrimination and harassment through open policies	171.257 ^k	80	0.000	0.563	0.000
12	Encourage local employability schemes	153.624 ^l	80	0.000	0.533	0.000
13	Involve employees in business decisions that affect them and improve the work environment	128.861 ^m	80	0.000	0.488	0.000

^a100 cells (95.2%) have expected count less than 5; ^b121 cells (96.0%) have expected count less than 5; ^c82 cells (97.6%) have expected count less than 5; ^d77 cells (91.7%) have expected count less than 5; ^e100 cells (92.5%) have expected count less than 5; ^f103 cells (98.1%) have expected count less than 5; ^g104 cells (99.0%) have expected count less than 5; ^h125 cells (99.2%) have expected count less than 5; ⁱ98 cells (93.3%) have expected count less than 5; ^j121 cells (96.0%) have expected count less than 5; ^k98 cells (93.3%) have expected count less than 5; ^l104 cells (99.0%) have expected count less than 5; ^m104 cells (99.0%) have expected count less than 5

Respondents were requested to kindly rate the significance of given corporate social responsibility strategies to ensuring social security of workers: where 1- not significant, 2 –

of little significance, 3 – somewhat significant, 4 – significant, 5 –very significant, U – unsure. A Pearson chi-square goodness of fit test was undertaken for all the corporate responsibility strategies and all were determined to be significant towards ensuring social security of construction skilled and semi-skilled workers. The computed p-values, as shown in Figure 5.16, for all the strategies was < 0.05 . However, to determine the strategy with the most influence, the highest Cramer value, between 0 and 1, was considered to have the highest significance (Field, 2014: 743). Further to that, the Cramer values are highly significant since their $p < 0.001$, indicating that the values of the are unlikely to have happened if there was no association in the population.

5.4.4.2 Analysis of data

Analysis of data entailed correspondence analysis and normality tests before Pearson Chi-square tests. The analysis is described hereafter.

5.4.4.1 Correspondence Analysis

Since it is erroneously perceived that Likert scales intervals are equidistant (Yelland, 2010: 2), re-scaling must be undertaken through correspondence analysis which re-scaled the 5-point Likert scale from ordinal to interval data (Nkado & Meyer, 2001: 485). The results of the re-scaling, in Table 5.17, show that the ordinal ratings are not interval in nature and thus accurate interpretation will be achieved through the use of the re-scaled ratings. Furthermore, the nature of Euclidean distances represents negative skewness due to the majority of respondents rating the corporate social responsibility strategies very highly. Fielding (2014: 20) describes negative skewness as having frequent scores clustered at the higher ends and is characterised by high means. The ratings using the re-scaled 5-point scale were then considered for evaluating the computations undertaken for hypothesis 1.1.

Table 5.17: Re-scaling of 5-point Likert Scale

	Responses	Axis 1 co-ordinate	Axis 2 co-ordinate	Euclidean Distance	Adjusted 5-point scale
1	Not Significant	-0.046	0		1
2	Of little Significance	0.044	-0.029	0.095	1.064
3	Somewhat Significant	0.116	0.758	0.790	1.602
4	Significant	1.527	-0.405	1.829	2.845
5	Very Significant	-1.64	-0.324	3.168	5

5.4.4.2 Test of normality on corporate social responsibility strategies

Table 5.18 shows the results of the test of normality on corporate social responsibility strategies. A non-significant result (sig value of more than 0.05) indicates normality (Ghasemi & Zahediasl, 2012: 486). SPSS provides the Kolmogorov-Smirnova (K-S) (with

Lilliefors correction) and the Shapiro-Wilk normality tests. Using the Shapiro-Wilk test results, a sig value of 0.00 indicates that the data is not normally distributed. However, using the K-S test, a sig value of 0.061 indicates that the data is normally distributed. In such instances, the Shapiro-Wilk test takes precedent as supported by Razali and Wah (2011: 30), when they reported that for samples greater than 50, this test is always more sensitive compared to the K-S test. Therefore, the hypotheses were computed using non-parametric tests such as the Pearson chi-squared goodness of fit test, the Mann-Whitney and Kruskal-Wallis tests.

Table 5.18: Test of normality

Kolmogorov-Smirnova			Shapiro-Wilk		
Statistic	df	Sig.	Statistic	df	Sig.
0.075	135	0.061	0.881	135	0.000

5.4.4.3 Interpretation

The results show that all the strategies, except involving employees in business decisions that affect them and improve the work environment, have a high association with Cramer's values more than 0.5 (Field, 2014: 743) and are significant. Corporate social responsibility strategies are non-existent within the construction industry. If they are existent, they do not benefit the construction workers and the communities from which they are resident. The top 5 strategies include training staff on ways to reduce environmental footprint; offering outplacement services, retraining and severance benefits when closures and retrenchments are imminent; training staff on the effects and need of minimisation of consumption of natural resources within their communities; train staffing on strategies to reduce emissions of hazardous substances and encouraging implementation in communities; and establishing an environmental management system that transfers good practices to the communities. Environmental issues are fundamental to construction workers and their communities. Strategies that focus on training are also essential and there is a need to equip workers with the value-laden objectives.

The highest association was with provision of training of staff on ways to reduce environmental footprint. This assists the workers in protecting themselves from exposure to sickness and health issues where the extent of benefits is limited as is the situation in Zimbabwe. Theyel (2000: 264) supports this strategy by highlighting that the workforce has to be well trained and encouraged to replicate such attitudes even within their communities.

The United Nations Environment Programme (2005: 5) also supports such training as they elucidate that it is paramount for a holistic and consensus-based approach towards achieving sustainable development within the communities. This is supported by ILO (2013: 169) when they described the extent of social security as being the provision of benefits in kind to secure protection.

Involve employees in business decisions that affect them and improve the work environment had a moderate association. This is because it mostly benefits the work environment and construction companies. Though Rucker (2017: 17) and Mas-Machuca, Berbegal-Mirabent and Alegre (2016: 200) strongly motivate for its implementation, the intended benefit is not realised by the construction workers.

5.4.4.4 Hypothesis 1.1

For interpretation of the results, H0 and H1 are stated in statistical terms.

H0 The implementation of policies to ensure the well-being of all employees does not lead most to improved construction skilled and semi-skilled workers' social security in Zimbabwe

H1 The implementation of policies to ensure the well-being of all employees leads most to improved construction skilled and semi-skilled workers' social security in Zimbabwe

The results in Table 5.16 show evidence to support the null hypothesis as the strategy with the most significant should have the highest Cramer's value. Therefore, the implementation of policies to ensure the well-being of all employees does not lead most to improved construction skilled and semi-skilled workers' social security in Zimbabwe.

5.4.5 Sub-question 1.2

What is the difference of perceptions, due to demographic variables, of construction site managers'/ project managers' and construction skilled trade workers on corporate social responsibility strategies that lead the most to improved construction skilled and semi-skilled workers' social security?

To satisfy the sub-question, the results, analysis of data, interpretation and hypothesis testing is undertaken hereafter

5.4.5.1 Results

The results show that there was no statistically significant difference in the average of corporate social responsibility strategies concerning age (0.155), gender (0.857),

designation (0.560) and experience of respondents (0.517). However, educational levels of respondents (0.017) showed a statistically significant difference since its p-value was < 0.05. Further analysis was done and revealed, as shown in Table 5.19, a summary of the null hypothesis test for all the corporate social responsibility strategies.

Table 5.19: Summary of results for corporate social responsibility strategies

Corporate social responsibility strategy	Generation (Age) (Sig.)	Gender (sig.)	Designation (Sig.)	Educational level (Sig.)	Experience (Sig.)
Establish an environmental management system that transfers good practices to the communities	0.320	0.676	0.120	0.110	0.860
Train staff on ways to reduce environmental footprint	0.850	0.054	0.000	0.000	0.220
Train staff on the effects and need of minimisation of consumption of natural resources within their communities	0.170	0.327	0.010	0.000	0.690
Train staff on strategies to reduce emissions of hazardous substances	0.780	0.722	0.020	0.050	0.830
Involve employees in business decisions that affect them and improve the work environment	0.150	0.437	0.340	0.180	0.120
Offer outplacement services, retraining and severance benefits when closures and retrenchments are imminent	0.060	0.922	0.000	0.000	0.860
Extend training to life management, retirement planning and care of dependents	0.020	0.076	0.000	0.000	0.800
Be open to flexi-time and other work-life balance policies for construction skilled workers	0.060	0.256	0.200	0.210	0.210
Establish policies to ensure the well-being of all employees and the public	0.590	0.792	0.000	0.000	0.130
Zero tolerance to corruption, discrimination and harassment through open policies	0.640	0.028	0.050	0.250	0.970
Encourage local employability schemes	0.420	0.389	0.000	0.000	0.110
Offer quality work experience for construction trades students within local communities	0.360	0.634	0.000	0.000	0.960
Encourage employee volunteering in the community with financial contributions and help in kind	0.090	0.281	0.070	0.200	0.420
Average	0.155	0.857	0.560	0.017	0.517

Significance < 0.05

5.4.5.2 Analysis of data

Analysis of data entailed Mann-Whitney U tests and Kruskal-Wallis tests to ascertain significant differences due to demographic variables. The analysis considered the demographic variables separately and is explained hereafter.

5.4.5.1 Generation (Age)

The Kruskal-Wallis Test outputs on statistically significant differences between age categories are shown in Tables 5.20. The Kruskal-Wallis Test, Table 5.21, revealed that there was no statistically significant difference in the combined perceptions on the significance of strategies that ensure social security of workers across the 4 different age categories (n=2: Baby boomer; n=54: Generation X; n=78: Generation Y; n=1: Generation Z), average Chi-squared (3, n=135) =5.236, p =0.155.

Table 5.20: Kruskal-Wallis age ranks on corporate social responsibility strategies

Corporate social responsibility strategies	Generation	N	Mean Rank
	Baby boomer	2	102.5
	Generation X	54	71.67
	Generation Y	78	65.42
	Generation Z	1	2
	Total	135	

Table 5.21: Kruskal-Wallis test outputs on corporate social responsibility strategies

Corporate social responsibility strategies	Chi-Square	df	Asymp. Sig.
	5.236	3	0.155

5.4.5.2 Gender

The Mann-Whitney U Test outputs on statistically significant differences between genders are shown in Table 5.22. The Mann-Whitney U Test, Table 5.23, revealed that there is no statistically significant difference in the combined perceptions on the significance of strategies that ensure social security of males (Median =4, n =116) and females (Median =4, n =19) with p = 0.857.

Table 5.22: Mann-Whitney U gender ranks on corporate social responsibility strategies

Strategy	Gender	N	Mean Rank	Sum of Ranks
	Male	116	68.25	7916.5
	Female	19	66.5	1263.5
	Total	135		

Table 5.23: Mann-Whitney U test gender outputs on corporate social responsibility strategies

Strategy	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
	1073.5	1263.5	-0.181	0.857

5.4.5.3 Designation

The Mann-Whitney U Test outputs on statistically significant differences between designations are shown in Tables 5.24. The Mann-Whitney U Test, Table 5.25, revealed that there is no statistically significant difference in the combined perceptions on the significance of strategies that ensure social security of workers for managers (Median =4, n =54) and workers (Median =4, n =81) with p =0.56.

Table 5.24: Mann-Whitney U designation ranks on corporate social responsibility strategies

Strategy	Designation	N	Mean Rank	Sum of Ranks
	Managers	54	70.4	3801.5
	Skilled and Semi-skilled Workers	81	66.4	5378.5
	Total	135		

Table 5.25: Mann-Whitney U Test designation outputs on corporate social responsibility strategies

Strategy	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
	2057.5	5378.5	-0.583	0.560

5.4.5.4 Educational Level

The Kruskal-Wallis test outputs on statistically significant differences between education levels are shown in Table 5.26. The Kruskal-Wallis test, Table 5.27, revealed that there was a statistically significant difference in the combined perceptions on the significance of strategies that ensure social security of workers across the 5 different education levels (Level 1, n =36: Certificate; Level 2, n =16: Diploma; Level 3, n =39: Degree; Level 4, n =38: Minimum Ordinary level; Level 5, n =6: No Minimum Ordinary level), average Chi-squared (4, n =135) = 12.008, p =0.017.

Table 5.26: Kruskal-Wallis educational level ranks on corporate social responsibility strategies

Strategies	Education level	N	Mean Rank
	Certificate	36	53.89
	Diploma	16	56.22
	Degree	39	75.95
	Minimum Ordinary level	38	73.47
	No Minimum Ordinary level	6	97.75
	Total	135	

Table 5.27: Kruskal-Wallis test educational level outputs on corporate social responsibility strategies

Strategies	Chi-Square	df	Asymp. Sig.
	12.008	4	0.017

However, since the Kruskal-Wallis test shows the statistically significant difference in the combined perceptions on the significance of strategies that ensure social security of workers, it did not establish where the significant differences lie across the 5 different education levels. In such instances, Osei-Kyei and Chan (2017: 32) support the use of the Mann-Whitney U test on the significant strategies using a recalculated alpha value of 0.005 (0.05/10). Dividing by 10 relates to the number of groups that emanate from the 5 different educational levels. Therefore, the following strategies were considered: Train staff on ways to reduce environmental footprint; Train staff on the effects and need of minimisation of consumption of natural resources within their communities; Offer outplacement services, retraining and severance benefits when closures and retrenchments are imminent; Extend training to life management, retirement planning and care of dependents; Establish policies to ensure the well-being of all employees and the public; Encourage local employability schemes, and Offer quality work experience for construction trades students within local communities. The results for the Mann-Whitney U test on corporate social responsibility strategies that ensure social security of workers, as shown in Table 5.28. For training staff on ways to reduce environmental footprint the results show that there is a significant difference between certificate and degree holders since the p-value of 0.001 is < 0.005 , $r = 0.45$. Field (2004: 225) states that the Mann-Whitney U test interpretation relies on scores being ranked from lowest to highest; thus, the lowest mean rank is the group with the greatest number of lower scores. According to Table 5.29, those with certificates had a lower mean rank of 22.58 compared to diploma holders who had 35.31. This shows that certificate holders, who are predominantly skilled workers, are less enthused with this strategy as being significant than the diploma holders, who are predominantly site or project managers. The diploma holders view this strategy as being key to protecting workers within the workplace and their communities.

Table 5.28: Mann-Whitney U Test results on significant strategies

Strategy	Education Groups	Mann-Whitney U	Wilcoxon W	Z	r	Asymp. Sig. (2-tailed)
Train staff on ways to reduce environmental footprint	Certificate & Diploma	147	813	-3.212	0.45	0.001
Train staff on the effects and need of minimisation of consumption of natural resources within their communities	Certificate & Degree	443	1109	-3.081	0.36	0.002
	Certificate & No O level	39	705	-3.169	0.49	0.002
Offer outplacement services, retraining and severance benefits when closures and retrenchments are imminent	Diploma & Minimum O level	128.5	264.5	-3.714	0.51	0.000
Extend training to life management, retirement planning and care of dependents	Certificate & Diploma	126	262	-3.551	0.49	0.000
	Diploma & Minimum O level	96.5	232.5	-4.33	0.59	0.000
Establish policies to ensure the well-being of all employees and the public	Certificate & Degree	407	1073	-3.531	0.41	0.000
	Degree & Minimum O level	426.5	1167.5	-3.634	0.41	0.000
Encourage local employability schemes	Certificate & Degree	331	997	-4.363	0.50	0.000
Offer quality work experience for construction trades students within local communities.	Certificate & Diploma	139.5	805.5	-3.379	0.47	0.001
	Certificate & Degree	428.5	1094.5	-3.238	0.37	0.001

*Significance test value of 0.005

“For training staff on the effects and need of minimisation of consumption of natural resources within their communities”, the results show that there is a significant difference between a certificate and degree holders and also between certificate holders and those with no ordinary level subjects since the p-values of 0.002 and 0.002 respectively are < 0.005, $r = 0.36$ and 0.49 respectively. According to Table 5.29, those with certificates had a lower mean rank of 30.81 compared to degree holders who had 44.64. This shows that certificate holders, who are predominantly skilled workers, view this condition as being less significant than the degree holders, who are predominantly site or project managers. Again, for the corporate social responsibility strategy, the certificate holders have a mean rank of 19.58 whilst those with the no ordinary levels have a mean rank of 33.00.

Table 5.29: Results on the ranking of significant strategies

Strategy	Education level	N	Mean Rank	Sum of Ranks
Train staff on ways to reduce the environmental footprint	Certificate	36	22.58	813
	Diploma	16	35.31	565
	Total	52		
Train staff on the effects and need of minimisation of consumption of natural resources within their communities	Certificate	36	30.81	1109
	Degree	39	44.64	1741
	Total	75		
	Certificate	36	19.58	705
	No O level	6	33.00	198
	Total	42		
Offer outplacement services, retraining and severance benefits when closures and retrenchments are imminent	Diploma	16	16.53	264.5
	Minimum O level	38	32.12	1220.5
	Total	54		
Extend training to life management, retirement planning and care of dependents	Certificate	36	31.00	1116
	Diploma	16	16.38	262
	Total	52		
	Diploma	16	14.53	232.5
	Minimum O level	38	32.96	1252.5
	Total	54		
Establish policies to ensure the well-being of all employees and the public	Certificate	36	29.81	1073
	Degree	39	45.56	1777
	Total	75		
	Degree	39	47.06	1835.5
	Minimum O level	38	30.72	1167.5
	Total	77		
Encourage local employability schemes	Certificate	36	27.69	997
	Degree	39	47.51	1853
	Total	75		
Offer quality work experience for construction trades students within local communities.	Certificate	36	22.38	805.5
	Diploma	16	35.78	572.5
	Total	52		
	Certificate	36	30.40	1094.5
	Degree	39	45.01	1755.5
	Total	75		

Despite the lack of relevant instruction for those with the no ordinary levels, they perceive that training staff on the effects and need of minimisation of consumption of natural resources within their communities is fundamental to ensuring their social security. Skilled workers seem to view minimisation of consumption of natural resources within their communities as being of low significance as compared to degreed and those with no ordinary levels. This potentially stems from them perceiving that their training in technical and vocational institutions incorporates those aspects. Contrariwise, the managers on sites

seem to contradict this assertion as they more significantly relay that this strategy is required for both skilled and semi-skilled workers and it will ensure that their social security is achieved.

“For offering outplacement services, retraining and severance benefits when closures and retrenchments are imminent”, the results show that there is a significant difference between diploma holders and those with the minimum ordinary level since the p-value of 0.000 is < 0.005 , $r = 0.51$. According to Table 5.29, those with diploma holders had a lower mean rank of 16.53 compared to those with the minimum ordinary level who had 32.12. This shows that diploma holders, who are predominantly managers, are less enthused with this strategy as being significant than those with the minimum ordinary level, who are predominantly semi-skilled workers. The diploma holders have the advantage of being exposed to this strategy more through their training and work-related benefits whilst those with the minimum ordinary levels have not had the same exposure.

“For extending training to life management, retirement planning and care of dependents”, the results show that there is a significant difference between a certificate and degree holders and also between diploma holders and those with the minimum ordinary level since the p-values of 0.000 and 0.000, as shown in Table 5.26, respectively are < 0.005 , $r = 0.49$ and 0.59. According to Table 5.29, those with certificates had a higher mean rank of 31.00 compared to diploma holders who had 16.38. This shows that certificate holders, who are predominantly skilled workers, value this strategy as being more significant than the diploma holders, who are predominantly site or project managers. This difference could emanate from certificate holders not being exposed to any schemes that enable them to be conversant with life management, retirement planning and care of a dependent. The nature of their employment contracts also disadvantages them as companies do not see them as long-term investments. Again, for the corporate social responsibility strategy, the diploma holders have a mean rank of 14.53 whilst those with the minimum ordinary levels have a mean rank of 32.96. Despite the lack of relevant instruction for those with the minimum ordinary levels, as compared to those with diplomas, they perceive that training staff on life management, retirement planning and care of dependent is fundamental to ensuring their social security. Thus, training of semi-skilled workers should incorporate such aspects as these are detrimental to achieving social security of construction workers.

“For establishing policies to ensure the well-being of all employees and the public”, the results show that there is a significant difference between a certificate and degree holders and also between degree holders and those with minimum ordinary level subjects since the

p-values of 0.000 and 0.000, as shown in Table 5.28, respectively are < 0.005 , $r = 0.41$ and 0.41 . According to Table 5.29, those with certificates had a lower mean rank of 29.81 compared to degree holders who had 45.56. This shows that certificate holders, who are predominantly skilled workers, are less conscious of the importance of un-keeping one's well-being and generally protecting the public as compared to degree holders, who are predominantly site or project managers. Though degree holders, may be sufficiently instructed on this strategy, they, however, acknowledge its significance in enduring social security of construction workers. Again, for this corporate social responsibility strategy, the trend is consistent for the other group of degree holders and those with minimum ordinary levels. The degree holders have a mean rank of 47.06 whilst those with the minimum ordinary levels have a mean rank of 30.72. Construction skilled and semi-skilled workers don't seem to appreciate this strategy as compared to the managers. It is important that construction companies undertake awareness campaigns and even train their workers on this aspect as it is vital towards enhancing social security of workers. Not only is blue-collar work at high risk within this strategy, but they and their families are also prone to be most affected if they do not adhere to policies that enhance well-being.

"For encouraging local employability schemes", the results show that there is a significant difference between certificate holders and degree holders since the p-value of 0.000, as shown in Table 5.26, is < 0.005 , $r = 0.50$. According to Table 5.29, those with certificate holders had a lower mean rank of 27.69 compared to degree holders who had a mean rank of 47.51. This shows that degree holders, who are predominantly managers, are more open to encouraging local employability schemes as compared to certificate holders. The advantage is that those who make the decisions, the managers, within construction companies are the ones who realise the importance of this strategy and are best suited to operationalise it. However, the ones that are most affected, the construction workers, seem not to be as driven on this strategy and may need to be educated on its importance towards ensuring their social security. This will enable them, in future projects, to advocate for preferential treatment for those within the local communities in which projects are being undertaken.

"For offering quality work experience for construction trades students within local communities", the results show that there is a significant difference between certificate holders and diploma holders, and between certificate holders and degree holders, since their p-values of 0.001 and 0.001 respectively, as shown in Table 5.27, are < 0.005 , $r = 0.47$ and 0.37 respectively. According to Table 5.29, those with diploma holders had a higher

mean rank of 35.78 compared to those with certificate holders who had 22.38. This shows that diploma holders, who are predominantly managers, are more open to accommodating local students for attachments for trades as compared to certificate holders, who are predominantly semi-skilled workers. Again, the other groups which had a significant difference are certificate holders and degree holders. Those with degrees had a higher mean rank of 45.01 compared to those with certificate holders who had 30.40. Generally, the results show that construction skilled and semi-skilled workers have a lower appreciation of companies offering quality work experience for construction trades students within local communities compared to managers. It is prudent that those who will benefit the most, the construction workers, be more driven to students within their communities be exposed to quality work experience. This does not only benefit the workers themselves but will also uplift their communities through community volunteer projects being undertaken by skilled workers.

5.4.5.5 Experience

The Kruskal-Wallis Test outputs on statistically significant differences between experience categories are shown in Table 5.30.

Table 5.30: Kruskal-Wallis experience ranks on corporate social responsibility strategies

Strategies	Experience	N	Mean Rank
	1-5 years	33	59.98
	6-10 years	47	70.71
	11-15 years	23	74.59
	15+	32	67.55
	Total	135	

The Kruskal-Wallis test, Table 5.31, revealed that there was no statistically significant difference in the combined perceptions on the significance of strategies that ensure social security of workers work across the 4 different experience categories (Experience 1, n =33: 1-5 years; Experience 2, n =47: 6-10 years; Experience 3, n =23: 11-15 years; Experience 4, n =32: 15+ years), average Chi-squared (3, n =135) = 2.277, p = 0.517.

Table 5.31: Kruskal-Wallis test experience outputs on corporate social responsibility strategies

Strategies	Chi-Square	df	Asymp. Sig.
	2.277	3	0.517

5.4.5.3 Interpretation

Table 5.19 shows demographics of designation and educational level had a statistically significant difference in the following strategies: Train staff on ways to reduce environmental footprint; Train staff on the effects and need of minimisation of consumption of natural resources within their communities; Offer outplacement services, retraining and severance benefits when closures and retrenchments are imminent; Establish policies to ensure the well-being of all employees and the public; Encourage local employability schemes, and Offer quality work experience for construction trades students within local communities. Iyortsuun and Akpusugh (2013: 2) motivate that employees' lifestyles are dependent on surrounding environmental factors that include reduction of environmental footprint. Gribble and Miller (2009: 7, 10) states that outplacement services reduce dormancy of retrenches as they can be skilled in new jobs to enable them to be re-employed and continue fending for their social needs. Alewell and Hauff (2013: 483) attest that offering severance benefits to employees is a critical social responsibility strategy. Zheng and Fujimoto (2016: 959) extend the necessity of employee treatment in enhancing employee well-being within their workplace and community. Cunnen, Martin-Rodgers and Mortimer (2009: 172) support the development of smart policies that enhance student's self-efficacy through encouraging work experiences within their communities. Verhaar and Smulders (1999: 271) assert that employees agree that training through local employability schemes is appropriate to grow them into competent workers.

The results indicated statistically significant differences due to educational levels. However, individual strategies had specified results. These are also further analysed hereafter. For the age demographic, "extension of training to life management, retirement planning and care of dependents" was the only strategy that had statistically significant differences. It is also a statistically significant difference for the designation and educational level demographic. The younger and older generation has a different perspective on the need for such training as suggested by Angeloni and Borgonovi (2016: 479) as they supported an intergenerational redistribution of education between younger and older people. This stems from an existing anomaly within developing countries which is supported by Iyortsuun and Akpusugh (2013: 2) when they stated that employees and retirees in Nigeria are increasingly encouraging for more training in retirement planning. The lack of appreciation of care of dependents is alluded to by Baptiste (2008: 2) when the author reported that childcare provisions are affected due to lack of training. The educational level demographic aspect is consistent with Sutherland (2017: 2384) when the author stated that untrained individuals are prone to negative experiences of employee well-being.

Table 5.32: Comparison of site or project managers' (SPM) and skilled and semi-skilled construction workers' (CSSSW) ranking of corporate social responsibility strategies

Strategy	SPM			CSSW		
	Cramer's value	Asymp. Sig.	Rank	Cramer's value	Asymp. Sig.	Rank
Train staff on the effects and the need for minimisation of consumption of natural resources within their communities	0.825	0.000	1	0.818	0.000	3
Offer quality work experience for construction trades students on apprentices within local communities	0.816	0.000	2	0.521	0.043	12
Encourage local employability schemes	0.814	0.000	3	0.469	0.248	13
Train staff on ways to reduce the environmental footprint of construction activities	0.813	0.000	4	0.805	0.000	4
Offer outplacement services, retraining and severance benefits, when closures and retrenchments are imminent	0.789	0.000	5	0.837	0.000	1
Encourage employee volunteering in the community with financial contributions and help in kind	0.780	0.000	6	0.820	0.000	2
Establish policies to ensure the well-being of all employees and the public	0.761	0.001	7	0.712	0.000	8
Train staff on strategies to reduce the emission of hazardous substances	0.752	0.001	8	0.695	0.001	9
Establish an environmental management system that transfers good practices to the communities	0.743	0.000	9	0.773	0.000	6
Be open to flexi-time and other work-life balance policies for construction workers	0.719	0.001	10	0.607	0.000	10
Extend training to life management, retirement planning and care of dependents	0.711	0.001	11	0.778	0.000	5
Involve employees in business decisions that affect them and improve the work environment	0.673	0.041	12	0.558	0.020	11
Zero tolerance for corruption, discrimination, victimisation and harassment through open policies	0.617	0.222	13	0.724	0.000	7

Significance < 0.05

“Train staff on strategies to reduce emissions of hazardous substances” and “encouraging employee volunteering in the community with financial contributions and help in kind”, had statistically significant difference due to designation. A Cramer's value of 0.752 and 8th rank for site/project managers for the strategy of train staff on strategies to reduce emissions of hazardous substances was higher than construction workers (Cramer's value of 0.695) as shown in Table 5.31. Theyel (2000: 264) supports the assimilation of environmental management systems by both parties for achieving continuous and sustainable improvements. Encouraging employee volunteering in the community with financial contributions and help in kind had a Cramer's value of 0.780 for site/project managers compared to 0.820 for construction workers. Krasnopol'skaya (2014: 3,4) reports that corporate volunteering is regarded as an instrument for a company to exhibit and deliver welfare for the local community. Such volunteering must be driven by workers, thus emboldening increased productivity and satisfaction and improved standing in the communities in which they operate (Junior Achievement, 2009: 1).

All corporate social responsibility strategies within the demographics of gender and experience of respondents have no statistically significant difference. This means there is

no statistical evidence that males and females and also the different experience groups have differing views with regards to corporate social responsibility strategies that ensure social security of construction workers.

5.4.5.4 Hypothesis 1.2

For interpretation of the results, H_0 and H_1 are stated in statistical terms.

H_0 : *Age, gender, designation, educational levels and experience of construction site managers'/ project managers and construction skilled trade workers lead to significant differences of perceptions on corporate social responsibility strategies that lead the most to improved construction skilled and semi-skilled workers' social security.*

H_1 : *Age, gender, designation, educational levels and experience of construction site managers'/ project managers and construction skilled trade workers do not lead to significant differences of perceptions on corporate social responsibility strategies that lead the most to improved construction skilled and semi-skilled workers' social security.*

The results in Table 5.19, show there is statistical evidence to support the null hypothesis as some of the demographic variables had significant differences where the average p-value < 0.05 . The demographic variables of age, gender, designation and experience do not lead to significant differences of perceptions on corporate social responsibility strategies that lead the most to improved construction skilled and semi-skilled workers' social security. However, the demographic variable of educational levels leads to significant differences of perceptions on corporate social responsibility strategies that lead the most to an improved construction of skilled and semi-skilled workers' social security.

5.5 PEOPLE-CENTRED MANAGEMENT

Initially, an appreciation of the Zimbabwean construction industry on management approaches' effect on labour productivity and welfare of workers was undertaken. Insights of respondents were pertinent in this regard before specifically responding to the sub-question. The results, analysis and interpretation from these interrogations are presented under each sub-heading.

5.5.1 Management approach contribution to enhancing labour productivity levels

Respondents were requested to indicate the contribution of their management approach on enhancing labour productivity levels experienced on construction sites where; 1- very low extent, 2- low extent, 3- average, 4- high extent, 5- very high extent and U- unsure. Since it

is erroneously perceived that Likert scales intervals are equidistant (Yelland, 2010: 2), re-scaling must be undertaken through correspondence analysis which re-scaled the 5-point Likert scale from ordinal to interval data (Nkado & Meyer, 2001: 485). The results of the re-scaling, in Table 5.33, show that the ordinal ratings are not interval in nature and thus accurate interpretation will be achieved through the use of the re-scaled ratings. Furthermore, the nature of Euclidean distances represents positive skewness due to the majority of respondents rating the corporate social responsibility strategies lowly. Fielding (2014: 20) describes positive skewness as having frequent scores clustered at the lower ends and is characterised by low means.

Table 5.33: Re-scaling of 5-point Likert Scale

	Responses	Axis 1 co-ordinate	Axis 2 co-ordinate	Euclidean Distance	Adjusted 5-point scale
1	Very low extent	-2.534	-0.088		1
2	Low extent	-2.534	-0.088	0.00	1
3	Average	-1.036	-1.322	1.94	2.38
4	High extent	-0.300	0.837	2.28	4.00
5	Very high extent	0.595	-0.249	1.41	5

Table 5.34 shows people-centred management having the most contribution on labour productivity with a mean score of 3.92 which shows an average effect. It also shows that 45% of the respondents who indicated that they use a people-centred management approach reported that it had a very high extent contributed to the labour productivity levels experienced on construction sites. On the other hand, 61.1% of the respondents who indicated that they use a production centred management approach reported that it had a high extent effect on the labour productivity levels experienced on construction sites.

Table 5.34: Ranking of management approach contribution to enhanced labour productivity

Management approach	U	1	2	3	4	5	Mean Score	Rank
People-centred	0%	0%	0%	33%	22%	45%	3.92	1
Production centred	0%	2.4%	2.4%	25.4%	61.1%	8.7%	3.53	2

These results reflect the advantage of people-centred management approach overproduction centred management approach with regards to enhanced labour productivity on sites. Hoogervorst, Koopman and Van der Flier (2005: 94) support this approach by emphasising that efficient production processes and organisational success are a sum of employee centred approaches. Enhanced productivity, increased profitability and effective engagement are a result of leaders fostering a people-centred management approach (Black & La Venture, 2017: 27).

5.5.2 Management approaches' contribution to the welfare of construction workers

Site/project managers were requested to indicate the extent to which the management approach improves the welfare of construction workers where; 1- no improvement, 2- little improvement, 3- some improvement, 4- a significant improvement, 5- very significant improvement and U- unsure. The results of the re-scaling, in Table 5.35, show that the ordinal ratings are not interval in nature and thus accurate interpretation will be achieved through the use of the re-scaled ratings. Furthermore, the nature of Euclidean distances represents positive skewness due to the majority of respondents rating the corporate social responsibility strategies lowly. Fielding (2014: 20) describes positive skewness as having frequent scores clustered at the lower ends and is characterised by low means.

Table 5.35: Re-scaling of 5-point Likert Scale

	Responses	Axis 1 co-ordinate	Axis 2 co-ordinate	Euclidean Distance	Adjusted 5-point scale
1	Not Improvement	-2.534	-0.088		1
2	Little Improvement	-2.534	-0.088	0.00	1
3	Some Improvement	-1.036	-1.322	1.94	2.38
4	Significant Improvement	-0.300	0.837	2.28	4.00
5	Very Significant Improvement	0.595	-0.249	1.41	5

Table 5.36 shows that people-centred management contributes significantly to the welfare of workers with a mean of 4.22, whilst production centred management contributes to some improvement. It also shows that 85.1% of respondents indicated that the people-centred management approach contributes significantly to very significant improvement towards the welfare of construction workers whilst 40.8% of respondents indicated that the production centred management approach contributes significantly to very significant improvement towards the welfare of construction workers. The results concur with Hasan *et al.*, (2018: 932) who reported that influence of different management approaches is paramount in productivity studies, thus requiring introspection and implementation for the best return for and from workers.

Table 5.36: Ranking of management approach's contribution to the welfare of workers

Management approach	U	1	2	3	4	5	Mean	Rank
People-centred	0%	1.9%	1.9%	11.1%	33.3%	51.8%	4.22	1
Production centred	0%	11.1%	13%	35.1%	20.4%	20.4%	2.91	2

Casimir and Ng (2010: 502) supports the implementation of people-centred management aspects on construction sites due to it entailing a wide range of aspects that involve showing concern for the welfare of workers and showing appreciation for their efforts. Further to this, Durdyev and Ismail (2016: 455) suggests that managers have to improve on their

behavioural science competence to achieve the goal of enhanced construction labour productivity.

5.5.3 Sub-question 2.1

What significant people-centred management aspects influence adequate employment treatment for Zimbabwean construction skilled and semi-skilled workers the most?

To satisfy the sub-question, the results, analysis of data, interpretation and hypothesis testing is undertaken hereafter

5.5.3.1 Results

5.5.3.1.1 Significance of people-centred management aspects

Table 5.37: Significant people centred management aspects

(N=135) (P< 0.05= Significant)		Pearson Chi-Squared test				
Rank	Aspects	Test value	Degrees of freedom	P-value	Cramer's V	Asymp. Sig.
1	Build staff confidence in people-centred approaches	222.235 ^a	42	0.000	0.907	0.000
2	Supervise the workers appropriately upholding their rights	301.907 ^b	63	0.000	0.863	0.000
3	Invoke commitment in workers through cultivating a sense of belonging	292.048 ^c	63	0.000	0.849	0.000
4	Encourage teamwork through highlighting its benefits	185.684 ^d	42	0.000	0.829	0.000
5	Adopt a functioning reward culture for construction skilled workers	218.584 ^e	63	0.000	0.735	0.000
6	Train staff on people centred principles to drive practice and implement on sites	289.851 ^f	84	0.000	0.733	0.000
7	Promote continuous improvement on construction methods whilst incentivising the workers	142.958 ^g	42	0.000	0.728	0.000
8	Respect local cultures through having a flexible management structure	273.588 ^h	84	0.000	0.712	0.000
9	Inclusive management- include the workers and their views in task related decisions	132.244 ⁱ	42	0.000	0.700	0.000
10	Provide adequate resources on targets for person-centred approaches and suitable implementation strategies	252.955 ^j	84	0.000	0.684	0.000
11	Reflect best practice and industry standards always through construction methods	169.481 ^k	63	0.000	0.647	0.000
12	Promote a consistent approach to the adoption and implementation of people-centred values	225.294 ^l	84	0.000	0.646	0.000
13	Recognise and respect individual differences in the workplace and exploit the positives while proactively rectify the negatives	190.037 ^m	84	0.000	0.593	0.000
14	Accessible management- management should cultivate an open-door policy where workers are able to raise their concerns and get adequate re-dress	133.882 ⁿ	84	0.000	0.498	0.000
15	Improve consistency for workers and be flexible enough to allow for responsiveness to local differences	164.801 ^o	105	0.000	0.494	0.000

^a57 cells (86.4%) have expected count less than 5; ^b80 cells (90.9%) have expected count less than 5; ^c81 cells (92.0%) have expected count less than 5; ^d58 cells (87.9%) have expected count less than 5; ^e80 cells (90.9%) have expected count less than 5; ^f101 cells (91.8%) have expected count less than 5; ^g57 cells (86.4%) have expected count less than 5; ^h103 cells (93.6%) have expected count less than 5; ⁱ58 cells (87.9%) have expected count less than 5; ^j101 cells (91.8%) have expected count less than 5; ^k80 cells (90.9%) have expected count less than 5; ^l103 cells (93.6%) have expected count less than 5; ^m103 cells (93.6%) have expected count less than 5; ⁿ101 cells (91.8%) have expected count less than 5; ^o125 cells (94.7%) have expected count less than 5

Respondents were requested to kindly rate the significance of people-centred management aspects to ensuring adequate employment treatment: where 1- not significant, 2 – of little significance, 3 – somewhat significant, 4 – significant, 5 –very significant, u – unsure. A Pearson chi-square goodness of fit test was undertaken on all the people-centred management aspects' ratings and all were determined to be significant towards ensuring adequate employment treatment of construction skilled and semi-skilled workers. The computed p-values for all the strategies was < 0.05 , as shown in Table 5.37. Therefore, respondents perceive that a holistic people-centred management approach would significantly improve productivity. Improved productivity is the summation of these aspects inculcating confidence, motivation, increased employee involvement, encourage commitment, and interpersonal relationships.

However, to determine the strategy with the most influence, the highest Cramer value, between 0 and 1, was considered to have the highest significance (Field, 2014: 743). Further to that, the Cramer values are highly significant since their $p < 0.001$, indicating that the values of the are unlikely to have happened if there was no association in the population.

5.5.3.2 Analysis of data

Analysis of data entailed correspondence analysis and normality tests before Pearson Chi-squared tests. The analysis is described hereafter.

5.5.3.2.1 Correspondence Analysis

Since it is erroneously perceived that Likert scales intervals are equidistant (Yelland, 2010: 2), re-scaling must be undertaken through correspondence analysis which re-scaled the 5-point Likert scale from ordinal to interval data (Nkado & Meyer, 2001: 485).

Table 5.38: Re-scaling of 5-point Likert Scale for rating significance of people-centred management aspects

	Responses	Axis 1 co-ordinate	Axis 2 co-ordinate	Euclidean Distance	Adjusted 5-point scale
1	Not Significant	0	0		1
2	Of little Significance	-0.040	0	0.040	1.032
3	Somewhat Significant	-0.051	0.425	0.425	1.368
4	Significant	1.502	-0.198	1.673	2.693
5	Very Significant	-1.412	-0.226	2.914	5

The results of the re-scaling, in Table 5.38, show that the ordinal ratings are not interval in nature and thus accurate interpretation will be achieved through the use of the re-scaled ratings. Furthermore, the nature of Euclidean distances represents negative skewness due

to the majority of respondents rating the corporate social responsibility strategies very highly. Fielding (2014: 20) describes negative skewness as having frequent scores clustered at the higher ends and is characterised by high means. The ratings using the re-scaled 5-point scale were then considered for evaluating the computations undertaken for hypothesis 2.1.

5.5.3.2.2 Test of normality on people-centred management practices

Table 5.39 shows the results of the test of normality on people-centred management practices. A non-significant result (sig value of more than 0.05) indicates normality (Ghasemi & Zahediasl, 2012: 486). SPSS provides the K-S (with Lilliefors correction) and the Shapiro-Wilk normality tests. Using both the Shapiro-Wilk and K-S test results, a sig value of 0.000 indicates that the data is not normally distributed. Therefore, the hypotheses will be computed using non-parametric tests such as the Pearson chi-squared goodness of fit test, the Mann-Whitney and Kruskal-Wallis tests.

Table 5.39: Test of normality

Kolmogorov-Smirnova			Shapiro-Wilk		
Statistic	df	Sig.	Statistic	df	Sig.
0.160	135	0.000	0.774	135	0.000

5.5.3.3 Interpretation

The results show that the aspects of management cultivating an open-door policy where workers can raise their concerns and get adequate re-dress through access management and improving consistency for workers and be flexible enough to allow for responsiveness to local differences have a moderate association of $0.3 \leq v < 0.5$ (Field, 2014: 743). All the other aspects have a high association with Cramer's values of more than 0.5. Not only is the absence of people-centred management revealed by the results, but there is also a consensus from both managers and workers of its importance in ensuring adequate employment treatment of workers. This demands a migration from the dominant production-centred management to people-oriented management. The top 5 aspects include: building staff confidence in people-centred approaches; supervising the workers appropriately upholding their rights; invoking commitment in workers through cultivating a sense of belonging; encourage teamwork through highlighting its benefits; and adopting a functioning reward culture for construction skilled workers. These aspects confirm the stance by Black and La Venture (2017: 24) on building organisational cultures around employees, management and leadership. Empowering employees inevitably promotes commitment from workers (Bainbridge, 2015: 961). Teamwork is the reflection of the leadership within

the organisations and any gains in the treatment of workers is founded on this aspect (Lussier & Hendon, 2013: 347). Robust reward systems are revealed as correcting, transforming and motivating employees' behaviour towards respectfulness and integrity in the workplace (Janicijevic, 2013: 310). Emphasis should be placed on the implementation of these aspects within construction sites. Benefits are expected to cascade to the construction companies through improved productivity and profitability through improved welfare of workers.

5.5.3.4 Hypothesis 2.1

For interpretation of the results, H0 and H1 are stated in statistical terms.

H0: A functioning reward culture is not the most significant people-centred management aspect that leads to adequate employment treatment for Zimbabwean construction skilled and semi-skilled workers

H1: A functioning reward culture is the most significant people-centred management aspects that leads to adequate employment treatment for Zimbabwean construction skilled and semi-skilled workers

From Table 5.37, there is evidence to support the null hypothesis as the aspect with the most significant should have the highest Cramer's value. Therefore, a functioning reward culture is not the most significant people-centred management aspects that lead to adequate employment treatment for Zimbabwean construction of skilled and semi-skilled workers.

5.5.4 Sub-question 2.2

What is the difference of perceptions, due to demographic variables, of construction site managers'/ project managers' and construction skilled trade workers on people-centred management aspects that influence adequate employment treatment for construction skilled and semi-skilled workers the most? To satisfy the sub-question, the results, analysis of data, interpretation and hypothesis testing is undertaken hereafter

5.5.4.1 Results

The results show that there was no statistically significant difference in the average people-centred management aspects concerning generation (age) (0.232), gender (0.280), designation (0.212), educational level (0.080) and experience of respondents (0.663). Table 5.40 summarises the null hypothesis test for all the people-centred management practices.

Table 5.40: Summary of hypothesis test results for all the people-centred management practices

People-centred management aspects	Age (Sig.)	Gender (sig.)	Designation (Sig.)	Educational levels (Sig.)	Experience (Sig.)
Promote a consistent approach to the adoption and implementation of people-centred values	0.140	0.280	0.560	0.190	0.970
Build staff confidence in people-centred approaches	0.110	0.030	0.030	0.000	0.250
Improve consistency for workers and be flexible enough to allow for responsiveness to local differences	0.100	0.130	0.430	0.280	0.010
Reflect best practice and industry standards always through construction methods	0.500	0.510	0.170	0.290	0.430
Train staff on people centred principles to drive practice and implement on sites	0.130	0.310	0.050	0.020	0.680
Provide adequate resources on targets for person-centred approaches and suitable implementation strategies	0.130	0.090	0.070	0.080	0.460
Promote continuous improvement on construction methods whilst incentivising the workers	0.780	0.330	0.000	0.010	0.720
Encourage teamwork through highlighting its benefits	0.260	0.330	0.130	0.080	0.820
Supervise the workers appropriately upholding their rights	0.410	0.660	0.610	0.250	0.860
Respect local cultures through having a flexible management structure	0.140	0.080	0.680	0.690	0.420
Recognise and respect individual differences in the workplace and exploit the positives while proactively rectify the negatives	0.150	0.200	0.080	0.090	0.070
Adopt a functioning reward culture for construction skilled workers	0.070	0.830	0.020	0.000	0.510
Invoke commitment in workers through cultivating a sense of belonging	0.130	0.160	0.000	0.000	0.610
Inclusive management- include the workers and their views in task related decisions	0.110	0.890	0.110	0.360	0.520
Accessible management- management should cultivate an open-door policy where workers are	0.520	0.600	0.050	0.240	0.870
Average	0.232	0.280	0.212	0.080	0.663

Significance < 0.05

5.5.4.2 Analysis of data

Analysis of data entailed Mann-Whitney U tests and Kruskal-Wallis tests to ascertain significant differences due to demographic variables. The analysis considered the demographic variables separately and is explained hereafter.

5.5.4.2.1 Generation (Age)

The Kruskal-Wallis test outputs on statistically significant differences between generation categories are shown in Table 5.41. The Kruskal-Wallis test, Table 5.42, revealed that there was no statistically significant difference in the combined perceptions on the significance of people-centred management practice that ensure adequate employment treatment across 4 different age categories (n =2: Baby boomer; n =54: Generation X; n =78: Generation Y; n =1: Generation Z), average Chi-squared (3, n =135) = 4.288, p =0.232.

Table 5.41: Kruskal-Wallis age ranks on people-centred management practice

Aspects	Generation	N	Mean Rank
	Baby boomer	2	97.75
	Generation X	54	69.71
	Generation Y	78	66.91
	Generation Z	1	1
	Total	135	

Table 5.42: Kruskal-Wallis test age output on people-centred management practice

Aspects	Chi-Square	df	Asymp. Sig.
	4.288	3	0.232

5.5.4.2.2 Gender

The Mann-Whitney U test outputs on statistically significant differences between genders are shown in Table 5.43. The Mann-Whitney U test, Table 5.44, revealed that there is no statistically significant difference in the perceptions on the significance of people-centred management practice that ensures adequate employment treatment of males (Median =4, n =135) and females (Median =4, n =19) with p = 0.28.

Table 5.43: Mann-Whitney U gender ranks on people-centred management practice

Aspects	Gender	N	Mean Rank	Sum of Ranks
	Male	116	69.47	8058
	Female	19	59.05	1122
	Total	135		

Table 5.44: Mann-Whitney U test gender output on people-centred management practice

Aspects	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
	932	1122	-1.08	0.280

5.5.4.2.3 Designation

The Mann-Whitney U Test outputs on statistically significant differences between designations are shown in Table 5.45. The Mann-Whitney U test, Table 5.46, revealed that there is no statistically significant difference of people-centred management practice that ensures adequate employment treatment for managers (Median =4, n =54) and workers (Median =4, n =81) with $p = 0.212$.

Table 5.45: Mann-Whitney U designation ranks on people-centred management practice

Aspects	Gender	N	Mean Rank	Sum of Ranks
	Managers	54	73.13	3949
	Workers	81	64.58	5231
	Total	135		

Table 5.46: Mann-Whitney U test designation output on people-centred management practice

Aspects	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
	1910	5231	-1.249	0.212

5.5.4.2.4 Educational Level

The Kruskal-Wallis Test outputs on statistically significant differences between education levels are shown in Table 5. 47. The Kruskal-Wallis test, Table 5.48, revealed that there was no statistically significant difference in the combined perceptions on the significance of people-centred management practice that ensure adequate employment treatment across the 5 different educational levels (Level 1, n =35: Certificate; Level 2, n =16: Diploma; Level 3, n =39: Degree; Level 4, n =38: Minimum Ordinary Level; Level 5, n =6: No Minimum Ordinary Level), average Chi-squared (4, n =135) =8.45, $p =0.08$.

Table 5.47: Kruskal-Wallis educational level ranks on people-centred management practice

Aspects	Education level	N	Mean Rank
	Certificate	36	52.69
	Diploma	16	67.22
	Degree	39	74.79
	Minimum Ordinary level	38	73.37
	No Minimum Ordinary level	6	83.75
	Total	135	

Table 5.48: Kruskal-Wallis test educational level output on people-centred management practice

Aspects	Chi-Square	df	Asymp. Sig.
	8.45	4.00	0.080

5.5.4.2.5 Experience

The Kruskal-Wallis Test outputs on statistically significant differences between experience categories are shown in Table 5.49. The Kruskal-Wallis test, Table 5.50, revealed that there was no statistically significant difference in the combined perceptions on the significance of people-centred management practice that ensure adequate employment treatment across the 4 different experience categories (Experience 1, n =33: 1-5 years; Experience 2, n =47: 6-10 years; Experience 3, n =23: 11-15 years; Experience 4, n =32: 15+ years), average Chi-squared (3, n =135) =1.585, p =0.663.

Table 5.49: Kruskal-Wallis experience ranks on people-centred management practices

Aspects	Experience	N	Mean Rank
	1-5 years	33	64.82
	6-10 years	47	66.05
	11-15 years	23	77.07
	15+	32	67.63
	Total	135	

Table 5.50: Kruskal-Wallis test experience output on people-centred management practices

Aspects	Chi-Square	df	Asymp. Sig.
	1.585	3	0.663

5.5.4.3 Interpretation

The results, in Table 5.40, showed no statistically significant differences due to demographic variables. However, individual strategies had specified results. The individual strategies are further analysed hereafter with regards to their statistically significant differences. “Build staff confidence in people-centred approaches” is a people-centred management practice that has statistically significant differences due to gender, designation and educational levels. It was ranked 3rd by managers, with a Cramers' value of 0.849 whilst construction workers rank it 5th, with a Cramer's value of 0.902 as shown in Table 5.51. Burgess and Connell (2015: 803) reiterates that workplace vulnerability is dependent on gender, level of skill, age and ethnic status and this is fundamental in addressing the limitations of building staff confidence on people-centred approaches. Mullins (2002: 121) inspire organisations to empower and involve employees by having transparent decision making to all staff and reassuring criticism from all staff regardless of work status.

“Improve consistency for workers and be flexible enough to allow for responsiveness to local differences” had a statistically significant difference due to the experience of

respondents. The mean ranks for the experience designation, as shown in Table 5.49, is 1-5 years = mean rank of 64.82, 6-10 years= mean rank of 66.05, 11-15 years = mean rank of 77.07 and more than 15 years= mean rank of 67.63. From the results, the range with the highest mean rank is the 11-15 years, and this shows that this aspect is significant as viewed by respondents with considerable experience. In support, Black and La Venture (2017: 25) report that people-centred organisational cultures must operate on the precepts that all people are important and different, hence regardless of these, workers must be treated as is fitting their cultural needs.

Table 5.51: Comparison of site or project managers' (SPM) and skilled and semi-skilled construction workers' (CSSSW) ranking of people-centred management aspects

Aspects	SPM			CSSW		
	Cramer's Value	Asymp. Sig.	Rank	Cramer's Value	Asymp. Sig.	Rank
Train staff on people-centred principles to drive practice and implement on sites	0.901	0.000	1	0.754	0.000	12
Provide adequate resources on targets for person-centred approaches and suitable implementation strategies	0.859	0.000	2	0.766	0.000	11
Build staff confidence in people-centred approaches	0.849	0.000	3	0.902	0.000	5
Invoke commitment in workers through cultivating a sense of belonging	0.835	0.000	4	0.789	0.000	10
Supervise the workers appropriately upholding their rights	0.822	0.000	5	0.946	0.000	1
Encourage teamwork through highlighting its benefits	0.810	0.000	6	0.890	0.000	8
Adopt a functioning reward culture for construction-skilled workers	0.801	0.000	7	0.906	0.000	4
Respect local cultures through having a flexible management structure	0.792	0.000	8	0.899	0.000	6
Reflect best practice and industry standards always through construction methods	0.761	0.000	9	0.733	0.000	13
Promote continuous improvement on construction methods, whilst motivating the workers	0.729	0.004	10	0.829	0.000	9
Accessible management should cultivate an open-door policy, where workers are able to raise their concerns and get adequately re-dressed	0.688	0.017	11	0.576	0.002	15
Inclusive management – including the workers and their views in task-related decisions	0.670	0.031	12	0.918	0.000	3
Recognise and respect the individual differences in the workplace and exploit the positives, while proactively rectifying the negatives	0.657	0.010	13	0.895	0.000	7
Promote a consistent approach to the adoption and implementation of people-centred values	0.563	0.342	14	0.923	0.000	2
Improve consistency for workers and be flexible enough to allow for responsiveness to local differences	0.503	0.752	15	0.731	0.000	14

Significance < 0.05

“Promote continuous improvement on construction methods whilst incentivising the workers”, “adopt a functioning reward culture for construction skilled workers”, “invoke commitment in workers through cultivating a sense of belonging” and “train staff on people-centred principles to drive practice and implement on sites” had statistically significant difference due to educational levels of respondents. The mean ranks for the educational

level, as shown in Table 5.47, designation: certificate =52.69; diploma =67.22; degree =74.79; minimum ordinary levels =73.37; and no ordinary levels= 83.75. From the results, those with certificates and diplomas have the least mean ranks and this potentially means that their training incorporates, especially for those with certificates, this people-centred management norm. For those with diplomas, who are managers, the results show that they presume these norms are well articulated in construction workers. However, those with degrees seem to need more of these norms inculcated in workers and or implemented on construction sites. Further to this, those with no training at all seem to perceive these norms to be significant for them, as workers, to be adequately treated. The significance of this aspect is supported by Mullins (2002: 116) when they endorsed the appropriateness of people-centred management policies.

Demographics of designation and educational level had a statistically significant difference in the following aspects; promote continuous improvement on construction methods whilst incentivising the workers, adopt a functioning reward culture for construction skilled workers and invoke commitment in workers through cultivating a sense of belonging. For the designation demographic, the rankings on the norms were analysed as shown in Table 5.50. “Promote continuous improvement on construction methods whilst incentivising the workers” was ranked 10th by managers, with a Cramers' value of 0.729 whilst construction workers rank it 9th, with a Cramer's value of 0.829, as shown in Table 5.51. The results show that construction workers are more primarily concerned with promoting continuous improvement in construction methods. Toor (2008: 40, 41) encourages organisations to hone employee skills for improvement through analysing situations, and co-create strategies effectively which is a positive approach to exploiting strengths of employees.

“Adopt a functioning reward culture for construction skilled workers” was ranked 7th by managers, with a Cramer's value of 0.80, whilst construction workers rank it 4th, with a Cramer's value of 0.906, as shown in Table 5.51. The results show that the workers are more concerned with how they are being rewarded workers on construction sites. Janicijevic (2013: 310) confirms this by remarking that correcting, transforming and motivating employees' behaviour is most achieved by having a robust reward system. The robustness of the system is pertinent because a poorly designed and badly implemented reward system is worse than not having such a system at all (Lussier & Hendon 2013: 469). Thus, managers, anticipate enhanced efficiency if reward cultures are adopted within their construction organisations.

“Invoke commitment in workers through cultivating a sense of belonging” was ranked 4th by managers, with a Cramer’s value of 0.835, whilst construction workers ranked it 10th, with a Cramer’s value of 0.789, as shown in Table 5.51. The results show that construction workers are lesser convinced with having a sense of belonging being cultivated within them as compared to managers. This could be due to the nature of project-based employment contracts, and the mobility of construction workers within construction industries. Hoogervorst, Koopman and Van der Flier (2005: 94) acknowledge that efficient production processes are a sum of employees contributing through ideas and knowledge and that organisational success stems from employee centred approaches, thus enhancing their sense of belonging. Added to this, Bainbridge (2015: 961) recommends refining of job descriptions to reflect people-centred management responsibilities as a way of empowering employees and inclusivity.

5.5.4.4 Hypothesis 2.2

For interpretation of the results, H0 and H1 are stated in statistical terms.

H0: Age, gender, designation, educational levels and experience of construction site managers’/ project managers and construction skilled trade workers lead to significant differences of perceptions on people-centred management norm that influence adequate employment treatment for construction skilled and semi-skilled workers the most.

H1: Age, gender, designation, educational levels and experience of construction site managers’/ project managers and construction skilled trade workers do not lead to significant differences of perceptions on people-centred management norm that influence adequate employment treatment for construction skilled and semi-skilled workers the most.

The results in Table 5.40, show there is statistical evidence not to support the null hypothesis as all of the demographic variables had insignificant differences where the average p-value > 0.05. The demographic variables of age, gender, designation, educational levels and experience of construction site/project managers and construction skilled trade workers do not lead to significant differences of perceptions on people-centred management norm that influence adequate employment treatment for construction skilled and semi-skilled workers the most.

5.6 SUSTAINABILITY LEARNING OBJECTIVES SKILLED AND SEMI-SKILLED WORKERS

The attainment of sustainability literacy is dependent on establishing the gap within the construction industry and formulating specific sustainability learning objectives. Thus, respondents initially were required to comment on aspects that uncover these needs as contributing to adequately responding to the sub-question. The results, analysis and interpretation from these interrogations are presented under each sub-heading.

5.6.1 Understanding of sustainability literacy by site/project managers

Site/project managers were asked to comment on their understanding of sustainability literacy. Of the 54 returned questionnaires, 43 (79.6%) of respondents had at least one comment while 11 (20.4%) did not comment. All the comments were collected as textual data and undertaken through meaning condensation, coded and categorised, as presented in Table 5.52 before inference was undertaken. ATLAS.ti 8 was utilised to aid analysis. Coding was undertaken by two coders and achieved a reliable percentage of agreement of 85%. The categorisation was aided by literature in section 3.3.3. The aspects expected within sustainability literacy concern sustainable development and/ or training (Murray & Cotgrave, 2007: 13; Durdyev & Ismail, 2016: 456). Codification included: sustainability principles, sustainable practices, flexible training and relevant training. It is appreciable that the globalised push for sustainability development has infiltrated towards these professionals. Added to that, the curricula revisions within their training have captured these aspects. Also, the short-term training courses offered by some regulatory organisations have gone a long way with equipping them with understanding. Advancing sustainable development is fundamental in the achievement of sustainable development and this is shown by a combined 50% of the responses, as shown in Table 5.52.

Table 5.52: Frequencies of codes for the understanding of sustainability literacy

Example of comment	Code	Count	Category	Frequency
Workers knowledgeability on sustainability	Sustainability principles	25	Sustainable development	50%
Implementing sustainable practices and improving on them	Sustainability practices	4		
Promote skills through new technology	Relevant training	25	Training	50%
Training that ensures adaptation to new environments	Flexible training	4		
	Total	58		100%

Training, on the other hand, requires specific attention, though it was mentioned 50% of the times. The need for training that is sustained is important, and the understanding conveyed

by site/project managers is appreciable in the need to achieve a sustainability literate workforce, though more must be done (ILO, 2011: 5). The training mentioned by the respondents does not specifically speak to sustainability development aspects. However, it does indirectly reflect economic sustainability. Relevant training considers current global trends of evolving socio-economic needs and the industrial complexion of the country (Phuthi & Maphosa, 2007: 2). Flexible training captures competent skills transference through continuous development and technological advancement (Crawford & Vogl, 2006: 212; Bhatti & Kaur, 2010: 656). The aspect of training must thus be applied in particular references for them relate to sustainability and sustainability literacy. Long term interventions aligned to the incorporation of sustainability literacy in the training of professionals are thus envisaged. Marsden *et al.*, (2010: 545, 547), Brennan and Cotgrave (2014: 323) and Government of Zimbabwe (2014: 21) reiterate this need and emphasise transformation in training that captures the ever-changing trends towards social, economic and environmentally sustainable development.

5.6.2 Understanding of sustainability literacy by construction workers

Responses from skilled and semi-skilled workers were collected from a scale where; 1- very low, 2- low, 3- average, 4- high, 5-very high, u- unsure. The majority of skilled workers, 68%, had an average understanding of sustainability literacy, as shown in Table 5.53. More than half of semi-skilled workers, 55%, had a low understanding of sustainability literacy. Skilled workers had a median score of 3 that confirmed that they had an average understanding of sustainability literacy. The formalized training of skilled workers aided skilled workers to be equipped with such training.

Table 5.53: Rating on the understanding of sustainability literacy

Description	U	1	2	3	4	5	Mean Score	Median
Understanding of corporate social responsibility by construction skilled workers	0%	0%	11%	68%	16%	5%	3.15	3.00
Understanding of corporate social responsibility by construction semi-skilled workers	0%	43%	55%	0%	0%	2%	1.63	2.00

Semi-skilled workers had a mean of 1.63 and a median of 2, which shows at most a low understanding of sustainability literacy. This is a clear indication that semi-skilled training that is devoid of sustainability discourse. Of more concern are the 98% of semi-skilled workers who seem to only receive training on core aspects that enable them to undertake their work and are deficient in sustainability instruction. This is exacerbated by the non-structure the training entails. Long term interventions aligned to structuring the training of semi-skilled workers is thus envisaged.

5.6.2 Incorporation of sustainability learning objectives in the training of skilled and semi-skilled workers

Skilled and semi-skilled workers were requested to indicate the extent of incorporation of sustainability learning objectives within their training where; 1- very low extent, 2- low extent, 3- average, 4- high extent, 5- very high extent and U- unsure. Table 5.54 shows the majority of skilled workers (81%) indicating that their training's incorporation of sustainability learning objectives was average, whilst the majority of semi-skilled workers (55%) indicated that their training incorporated sustainability literacy to a low extent. The mean of 3.02 and median of 3 confirm average incorporation of sustainability learning objectives. Semi-skilled workers, on the other hand, had a mean of 1.59 and a median of 2.00, indicating low incorporation of sustainability learning objectives. There is a need for increased incorporation of sustainability learning objectives as already highlighted, more-so for semi-skilled workers.

Table 5.54: Rating of incorporation of sustainability learning objectives in the training of construction workers

Description	U	1	2	3	4	5	Mean Score	Median
Incorporation of sustainability learning objectives in training of skilled workers	0%	0%	11%	81%	3%	5%	3.02	3.00
Incorporation of sustainability learning objectives in training of semi-skilled workers	0%	43%	55%	2%	0%	0%	1.59	2.00

5.6.3 The extent to which on-the-job training of semi-skilled workers includes the requirements of sustainable dimensions

Site/project managers were requested to indicate the extent to which their training included the requirements of sustainability dimensions where; 1- very low extent, 2- low extent, 3- average, 4- high extent, 5- very high extent and U- unsure. Since it is erroneously perceived that Likert scales intervals are equidistant (Yelland, 2010: 2), re-scaling must be undertaken through correspondence analysis which re-scaled the 5-point Likert scale from ordinal to interval data (Nkado & Meyer, 2001: 485).

Table 5.55: Re-scaling of 5-point Likert scale for rating extent of inclusion of sustainability dimensions in the training of construction workers

	Responses	Axis 1 co-ordinate	Axis 2 co-ordinate	Euclidean Distance	Adjusted 5-point scale
1	Not at all	0	0		1
2	To a little extent	-0.641	1.071	1.25	2.11
3	To some extent	-0.528	0.248	0.83	2.86
4	To a great extent	-0.446	-0.605	0.86	3.62
5	To a very great extent	0.946	0.059	1.54	5

The results of the re-scaling, in Table 5.55, show that the ordinal ratings are not interval in nature and thus accurate interpretation will be achieved through the use of the re-scaled

ratings. Furthermore, the nature of Euclidean distances represents negative skewness. Fielding (2014: 20) describes negative skewness as having frequent scores clustered at the higher ends and is characterised by high means

Table 5.56: Ranking of the extent of inclusion of sustainability dimensions in the training of semi-skilled workers

Dimension	U	1	2	3	4	5	Mean	Rank
Social	19%	0%	15%	31%	26%	26%	3.44	1
Economic	19%	0%	8%	17%	26%	30%	3.10	2
Environmental	19%	0%	16%	19%	24%	20%	2.75	3

Table 5.56 shows that social issues are included in the training of semi-skilled workers, however to some extent. Despite this, low rating, they were ranked 1st. Environmental issues are only included to a little extent and were rated 3rd. Construction companies should facilitate the training of both skilled and semi-skilled workers, with more attention being placed on structured schemes. There is a need for continuous appraisal of on-the-job training schemes to ensure they are conversant with current trends in the industry. Skilled workers need to undergo short courses that assist them to be literate concerning sustainability.

5.6.4 Sub-question 3.1

What significant sustainability literacy aspects contribute the most to adequate productive work for technical and vocational trained Zimbabwean construction skilled workers? To satisfy the sub-question, the results, analysis of data, interpretation and hypothesis testing is undertaken hereafter

5.6.4.1 Results

5.6.4.1.1 Significant sustainability learning objectives

Table 5.57 shows the ranking of sustainability learning objectives with regards to contributing to adequate productive work. Respondents were requested to rate: where 1- not significant, 2 – of little significance, 3 – somewhat significant, 4 – significant, 5 –very significant, U – unsure. A Pearson chi-square goodness of fit test was undertaken on all the rated sustainability learning objectives and all were determined to be significant towards ensuring adequate productive work of construction skilled workers. The computed p-values for all the strategies was < 0.05, as shown in Table 5.57. The highest Cramer value, between 0 and 1, was considered to have the highest significance (Field, 2014: 743).

Further to that, the Cramer values are highly significant since their $p < 0.001$, indicating that the values of the are unlikely to have happened if there was no association in the population.

Table 5.57: Ranking of sustainability learning objectives

(N=91) (P< 0.05= Significant)		Pearson Chi-Squared test				
Rank	Aspects	Test value	Degrees of freedom	P-value	Cramer's V	Asymp. Sig.
1	The learner is able to facilitate improvements related to working conditions	277.382 ^a	112	0.000	0.873	0.000
2	The learner is able to communicate the need for sustainable practices in production	197.283 ^b	84	0.000	0.850	0.000
3	The learner knows conceptions of positive physical and mental health well-being instruction and can critically reflect on them within the workplace.	249.500 ^c	112	0.000	0.828	0.000
4	The learner knows the socio-economic dimensions of health and well-being required in the workplace	185.786 ^d	84	0.000	0.825	0.000
4	The learner understands that inequality is a major drive for societal problems and individual dissatisfaction	310.051 ^e	140	0.000	0.825	0.000
6	The learner understands the concepts of decent work	244.461 ^f	112	0.000	0.820	0.000
7	The learner is able to feel responsible about their water use on construction sites	235.832 ^g	112	0.000	0.805	0.000
8	The learner is able to challenge cultural and societal orientations in consumption and production	287.776 ^h	140	0.000	0.795	0.000
8	The learner is able to communicate the need for energy efficiency and sufficiency	229.851 ⁱ	112	0.000	0.795	0.000
10	The learner understands the importance of education as a driver of sustainable development	162.280 ^j	84	0.000	0.771	0.000
11	The learner understands conservation strategies that can be implemented during tasks	214.411 ^k	112	0.000	0.767	0.000
12	The learner is able to public demand and support policies that promote social and economic justice, in the workplace	260.441 ^l	140	0.000	0.757	0.000
13	The learner understands the consequences to climate change on productivity	252.678 ^l	140	0.000	0.745	0.000
14	The learner knows relevant prevention strategies to foster positive physical and mental health well-being in the workplace	187.157 ⁿ	112	0.000	0.717	0.000
15	The learner is able to identify their rights and clarify their values and needs related to work	181.834 ^o	112	0.000	0.707	0.000

^a145 cells (100%) have expected count less than 5; ^b114 cells (98.3%) have expected count less than 5; ^c145 cells (100.0%) have expected count less than 5; ^d115 cells (99.1%) have expected count less than 5; ^e172 cells (98.9%) have expected count less than 5; ^f145 cells (100.0%) have expected count less than 5; ^g144 cells (99.3%) have expected count less than 5; ^h172 cells (98.9%) have expected count less than 5; ⁱ144 cells (99.3%) have expected count less than 5; ^j116 cells (100.0%) have expected count less than 5; ^k143 cells (98.6%) have expected count less than 5; ^l172 cells (98.9%) have expected count less than 5; ^m173 cells (99.4%) have expected count less than 5; ⁿ114 cells (99.3%) have expected count less than 5; ^o143 cells (98.6%) have expected count less than 5.

5.6.4.2 Analysis of data

Analysis of data entailed correspondence analysis and normality tests before Pearson Chi-squared tests. The analysis is described hereafter.

5.6.4.2.1 Correspondence Analysis

Since it is erroneously perceived that Likert scales intervals are equidistant (Yelland, 2010: 2), re-scaling must be undertaken through correspondence analysis which re-scaled the 5-point Likert scale from ordinal to interval data (Nkado & Meyer, 2001: 485)

Table 5.58: Re-scaling of 5-point Likert scale for rating significance of sustainability learning objectives

	Responses	Axis 1 co-ordinate	Axis 2 co-ordinate	Euclidean Distance	Adjusted 5-point scale
1	Not Significant	0	0		1
2	Of little Significance	-0.242	-2.195	2.208	2.297
3	Somewhat Significant	1.040	0.286	2.793	3.937
4	Significant	0.134	-0.192	1.024	4.539
5	Very Significant	-0.515	0.251	0.786	5

The results of the re-scaling, in Table 5.58, show that the ordinal ratings are not interval in nature and thus accurate interpretation will be achieved through the use of the re-scaled ratings. The ratings using the re-scaled 5-point scale were then considered and the computations were undertaken for hypothesis 3.1 and hypothesis 3.2.

5.6.4.2.2 Test of normality on sustainability learning objectives

Table 5.59 shows the results of the test for the normality of sustainability learning objectives. A non-significant result (sig value of more than 0.05) indicates normality (Ghasemi & Zahediasl, 2012: 486). SPSS provides the K-S (with Lilliefors correction) and the Shapiro-Wilk normality tests. Using both the Shapiro-Wilk and K-S test results, a sig value of 0.00 indicates that the data is not normally distributed. Therefore, the hypotheses will be computed using non-parametric tests such as the Pearson chi-squared goodness of fit test, the Mann-Whitney and Kruskal-Wallis tests.

Table 5.59: Test of normality

Kolmogorov-Smirnova			Shapiro-Wilk		
Statistic	df	Sig.	Statistic	df	Sig.
0.165	91	0.000	0.755	91	0.000

5.6.4.3 Interpretation

The results show that all the learning objectives have a high association with Cramer's values more than 0.5 (Field, 2014: 743). For skilled to provide adequate productive work they need enhanced instruction in sustainability and decent work learning objectives. The insufficiency of the current curricula in addressing these objectives is evident within the Zimbabwean construction industry. The National Manpower Advisory Committee's mandate of contributing towards manpower deficiencies requires such confirmation to advance sustainability literacy within the training of skilled workers. Added to that, there is an immediate need to equip skilled workers on construction sites with these learning objectives and this should be a construction industry-wide initiative, for it to be effective.

The top 5 sustainability learning objectives include: the learner is able to facilitate improvements related to working conditions; the learner is able to communicate the need for sustainable practices in production; the learner knows conceptions of positive physical and mental health well-being instruction and can critically reflect on them within the workplace; the learner knows the socio-economic dimensions of health and well-being required in the workplace, and the learner understands that inequality is a major drive for societal problems and individual dissatisfaction.

Construction workers' importance is measured by their innovativeness and this can only be encouraged through learning objectives that are creation centred. Training is essential to ensuring innovation (Cotgrave & Kokkarinen, 2010: 268). Sustainable practices have become the norm in every industry, including construction. Technical and vocational training needs to align with the changing needs in a working world Blewitt (2010: 482). Instruction in physical and mental well-being is critical for blue-collar workers. Good health and well-being of workers can only be ascertained through training interventions by construction companies (Freitas, Silva & Santos, 2017: 791). Violation of equality in the workplace is best addressed through training in decent work objectives (ILO, 2018c: 28).

5.6.4.4 Hypothesis 3.1

For interpretation of the results, H0 and H1 are stated in statistical terms.

H0: Positive physical and mental health well-being learning objectives do not contribute the most to adequate productive work for technical and vocational trained Zimbabwean construction skilled workers

H1: Positive physical and mental health well-being learning objectives contribute the most to adequate productive work for technical and vocational trained Zimbabwean construction skilled workers

From Table 5.57, there is evidence to support the null hypothesis as the learning objective with the most significant should have the highest Cramer's value. Therefore, positive physical and mental health well-being learning objectives do not contribute the most to adequate productive work for technical and vocational trained Zimbabwean construction skilled workers.

5.6.5 Sub-question 3.2

What is the difference of perceptions, due to demographic variables, of construction site managers'/ project managers, vocational lecturers and construction skilled trade workers on sustainability literacy aspects that contribute the most to adequate productive work for construction skilled workers? To satisfy the sub-question, the results, analysis of data, interpretation and hypothesis testing is undertaken hereafter

5.6.5.1 Results

The results in Table 5.60 show that there was no statistically significant difference in the aggregate sustainability learning objectives through training of skilled workers with regards to age (0.192), gender (0.514), designation (0.380), educational levels of respondents (0.582) and experience of respondents (0.483). All the demographics showed no statistically significant difference since their p-value were all > 0.05.

Table 5.60: Summary of statistical significance tests

Sustainability Learning Objectives	Age (Sig.)	Gender (sig.)	Designation (Sig.)	Educational levels (Sig.)	Experience (Sig.)
The learner is able to publicly demand and support policies that promote social and economic justice in the workplace	0.199	0.514	0.04	0.10	0.41
The learner knows conceptions of positive physical and mental health well-being instruction and can critically reflect on them in the workplace.	0.297	0.65	0.10	0.31	0.62
The learner knows the socio-economic dimensions of health and well-being required in the workplace	0.233	0.05	0.43	0.82	0.67
The learner knows the relevant prevention strategies to foster positive physical and mental well-being in the workplace	0.301	0.01	0.00	0.01	0.64
The learner understands the importance of education, as a driver of sustainable development	0.469	0.06	0.07	0.11	0.97
The learner is able to feel responsible for his water use on construction sites	0.360	0.370	0.590	0.160	0.830
The learner is able to communicate the need for energy efficiency and sufficiency	0.226	0.850	0.070	0.100	0.630
The learner understands the concept of decent work	0.230	0.580	0.680	0.890	0.210
The learner is able to facilitate improvements related to working conditions	0.328	0.910	0.330	0.510	0.570
The learner is able to identify his rights and clarify his values and needs related to work	0.539	0.750	0.760	0.080	0.470
The learner understands that inequality is a major driver for societal problems and individual dissatisfaction	0.119	0.750	0.100	0.020	0.090
The learner is able to communicate the need for sustainable practices in production	0.256	0.820	0.040	0.140	0.320
The learner is able to challenge cultural and societal orientations in consumption and production	0.046	0.690	0.290	0.480	0.230
The learner understands the consequences of climate change on productivity	0.134	0.260	0.550	0.780	0.080
The learner understands the conservation strategies that can be implemented during tasks	0.215	0.950	0.090	0.140	0.940
Average	0.192	0.514	0.380	0.582	0.483

Significance < 0.05

5.6.5.2 Analysis of data

Analysis of data entailed Mann-Whitney U tests and Kruskal-Wallis tests to ascertain significant differences due to demographic variables. The analysis considered the demographic variables separately and is explained hereafter.

5.6.5.2.1 Generation (Age)

The Kruskal-Wallis Test outputs on statistically significant differences between age categories are shown in Table 5.61. The Kruskal-Wallis test, Table 5.62, revealed that there was no statistically significant difference in the combined perceptions on the significance of sustainability learning objectives in ensuring adequate productive work across 4 different age categories (n =1: Baby boomer; n =36: Generation X; n =53: Generation Y; n =1: Generation Z), average Chi-squared (3, n =91) =4.74, p =0.192.

Table 5.61: Kruskal-Wallis age ranks on sustainability learning objectives

Learning Objectives	Generation	N	Mean Rank
	Baby boomer	1	89
	Generation X	36	46.74
	Generation Y	53	45.4
	Generation Z	1	8.5
	Total	91	

Table 5.62: Kruskal-Wallis test age output on sustainability learning objectives

Learning Objectives	Chi-Square	df	Asymp. Sig.
	4.74	3	0.192

5.6.5.2.2 Gender

The Mann-Whitney U Test outputs on statistically significant differences between genders are shown in Table 5.63. The Mann-Whitney U test, Table 5.64, revealed that there is no statistically significant difference in the perceptions on the significance of sustainability learning objectives in ensuring adequate productive work of males (Median =4, n =24) and females (Median =4, n =8) with p =0.514.

Table 5.63: Mann-Whitney U gender ranks on sustainability learning objectives

Learning Objectives	Gender	N	Mean Rank	Sum of Ranks
	Male	75	45.17	3387.5
	Female	16	49.91	798.5
	Total	91		

Table 5.64: Mann-Whitney U test gender output on sustainability learning objectives

Learning Objectives	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
	537.5	3387.5	-0.653	0.514

5.6.5.3 Designation

The Mann-Whitney U Test outputs on statistically significant differences between designations are shown in Table 5.65. The Mann-Whitney U test, Table 5.66, revealed that there is no statistically significant difference in the combined perceptions on the significance of sustainability learning objectives in ensuring adequate productive work for managers (Median =4, n =54) and workers (Median =4, n =37) with $p = 0.38$.

Table 5.65: Mann-Whitney U designation ranks on sustainability learning objectives

Learning Objectives	Gender	N	Mean Rank	Sum of Ranks
	Managers	54	44.01	2376.5
	Workers	37	48.91	1809.5
	Total	91		

Table 5.66: Mann-Whitney U test designation output on sustainability learning objectives

Learning Objectives	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
	891.5	2376.5	-0.87	0.380

5.6.5.4 Educational Level

The Kruskal-Wallis Test outputs on statistically significant differences between education levels are shown in Table 5.67. The Kruskal-Wallis test, Table 5.68, revealed that there was no statistically significant difference in the combined perceptions on the significance of sustainability learning objectives in ensuring adequate productive work across the 3 different education levels (Level 1, n =15: Certificate; Level 2, n =5: Diploma; Level 3, n =12: Degree), average Chi-squared (3, n =32) =1.47, $p = 0.59$.

Table 5.67: Kruskal-Wallis educational level ranks on sustainability learning objectives

Learning Objectives	Education level	N	Mean Rank
	Certificate	36	47.94
	Diploma	16	49.56
	Degree	39	42.74
	Total	91	

Table 5.68: Kruskal-Wallis test educational level output on sustainability learning objectives

Learning Objectives	Chi-Square	df	Asymp. Sig.
	1.083	2	0.582

5.6.5.5 Experience

The Kruskal-Wallis ranks on statistically significant differences between experience categories are shown in Table 5.69. The Kruskal-Wallis test, Table 5.70, revealed that there was no statistically significant difference in the combined perceptions on the significance of sustainability learning objectives in ensuring adequate productive work across the 4 different experience categories (Experience 1, n =5: 1-5 years; Experience 2, n =8: 6-10 years; Experience 3, n =7: 11-15 years; Experience 4, n =12: 15+ years), average Chi-squared (3, n=32) =1.88, p=0.65.

Table 5.69: Kruskal-Wallis experience ranks on sustainability learning objectives

Learning Objectives	Experience	N	Mean Rank
	1-5 years	21	38.48
	6-10 years	31	47.23
	11-15 years	18	47.33
	15+	21	50.57
	Total	91	

Table 5.70: Kruskal-Wallis test experience output on sustainability learning objectives

Learning Objectives	Chi-Square	df	Asymp. Sig.
	2.455	3	0.483

5.6.5.3 Interpretation

The results, in Table 5.60, showed no statistically significant differences due to demographic variables. However, individual strategies had specified results. The individual sustainability learning objectives through training curricula of skilled workers are further analysed hereafter with regards to their statistically significant differences.

The learning objective of “The learner is able to publicly demand and support policies that promote social and economic justice in the workplace” had p=0.04 for the demographic aspect of designation, indicating a statistically significant difference. Table 5.71 shows managers ranking the objective 8th with a Cramer’s value of 0.840, whilst construction workers ranked the learning objective 1st, with a Cramer’s value of 0.955. Though both designations consider the learning objective significant the construction workers are more in need of training in this objective as it empowers them to criticise their work environments and lobby for improvements. The assertion by MacNaughton and Frey (2011: 448) on the primary purposes of the ILO being to promote social justice is only achievable if workers are enabled to freely communicate their concerns on construction sites without fear or favour.

The learning objective of “The learner is able to communicate the need for sustainable practices in production” had $p=0.04$ for the demographic aspect of designation, indicating a statistically significant difference. Table 5.71 shows managers ranking the objective 7th, with a Cramer’s value of 0.847, whilst construction workers ranked the learning objective 2nd, with a Cramer’s value of 0.949. Though both designations consider the learning objective significant, construction workers ranked it higher due to the inherent need that requires urgent training in the full complement of skills towards achieving “greening” of jobs, which has become an emblem of sustainable development (ILO, 2011: 13). Whilst the managers have acquired some semblance of literacy of sustainable practices in production on construction sites, it is the construction workers who require intensive and extensive sustainability instruction.

Table 5.71: Comparison of site or project managers’ (SPM) and skilled construction workers’ (CSW) ranking of sustainability learning objectives

Learning Objectives	SPM			CSW		
	Cramer’s Value	Asymp. Sig.	Rank	Cramer’s Value	Asymp. Sig.	Rank
The learner is able to communicate the need for energy efficiency and sufficiency	0.919	0.000	1	0.912	0.000	6
The learner is able to facilitate improvements related to working conditions	0.903	0.000	2	0.825	0.091	13
The learner knows conceptions of positive physical and mental health well-being instruction and can critically reflect on them in the workplace	0.880	0.000	3	0.904	0.003	8
The learner understands the importance of education, as a driver of sustainable development	0.872	0.001	4	0.813	0.108	14
The learner understands the conservation strategies that can be implemented during tasks	0.872	0.000	4	0.904	0.025	8
The learner is able to feel responsible for his water use on construction sites	0.865	0.000	6	0.938	0.000	4
The learner is able to communicate the need for sustainable practices in production	0.847	0.000	7	0.949	0.010	2
The learner knows the socio-economic dimensions of health and well-being required in the workplace	0.840	0.005	8	0.955	0.001	1
The learner understands that inequality is a major driver for societal problems and individual dissatisfaction	0.839	0.000	9	0.947	0.001	3
The learner is able to challenge cultural and societal orientations in consumption and production	0.815	0.003	10	0.890	0.001	10
The learner understands the concept of decent work	0.804	0.012	11	0.840	0.008	12
The learner is able to publicly demand and support policies that promote social and economic justice in the workplace	0.801	0.007	12	0.927	0.002	5
The learner understands the consequences of climate change on productivity	0.770	0.037	13	0.864	0.049	11
The learner knows the relevant prevention strategies to foster positive physical and mental well-being in the workplace	0.767	0.061	14	0.907	0.024	7
The learner is able to identify his rights and clarify his values and needs related to work	0.757	0.089	15	0.715	0.297	15

Significance < 0.05

The learning objective of “The learner knows the relevant prevention strategies to foster positive physical and mental well-being in the workplace” had $p = 0.000$ for the demographic aspect of designation, indicating a statistically significant difference. Table

5.71 shows managers ranking the objective insignificant with a p-value = 0.061 which is > 0.05, whilst construction workers ranked the learning objective 7th, with a Cramer's value of 0.907. Transition to a green economy is essential for improvements in decent work includes equipping construction workers with relevant preventative strategies to foster their well-being (ILO, 2018b:2)

The learning objectives of “The learner knows the relevant prevention strategies to foster positive physical and mental well-being in the workplace” and “The learner understands that inequality is a major driver for societal problems and individual dissatisfaction” have $p=0.01$ and $p=0.02$ respectively, indicating that there is a significant difference due to educational levels. According to Table 5.67, those with certificates have a mean rank of 47.94, diplomas= 49.56 and degrees=42.74. The mean ranks show that those with diplomas and certificates have a greater need for these two learning objectives compared to those with degrees. This shows that training curricula within the certificates and diplomas need to incorporate the specifics of the learning objectives of “The learner knows the relevant prevention strategies to foster positive physical and mental well-being in the workplace” and “The learner understands that inequality is a major driver for societal problems and individual dissatisfaction”. This is supported by ILO (2018c: 17) when they argued that jobs in most sectors, are threatened by a continued decent work deficit and ILOb (2018:2) they reported on inequality and the need for appropriate policies that address this phenomenon.

5.6.5.4 Hypothesis 3.2

For interpretation of the results, H_0 and H_1 are stated in statistical terms.

H0: Age, gender, designation, educational levels and experience of construction site managers'/ project managers, vocational lecturers and construction skilled trade workers lead to significant differences of perceptions on perceptions of sustainability literacy objectives that contribute the most to adequate productive work for construction skilled workers

H1: Age, gender, designation, educational levels and experience of construction site managers'/ project managers, vocational lecturers and construction skilled trade workers do not lead to significant differences of perceptions on perceptions of sustainability literacy objectives that contribute the most to adequate productive work for construction skilled workers

The results in Table 5.60, show there is statistical evidence not to support the null hypothesis as all of the demographic variables had insignificant differences where the average p-value > 0.05. The demographic variables of age, gender, designation, educational levels and experience of construction site managers'/ project managers, vocational lecturers and construction skilled trade workers do not lead to significant differences of perceptions on perceptions of sustainability literacy objectives that contribute the most to adequate productive work for construction skilled workers.

5.6.6 Sub-question 4.1

What significant sustainability literacy objectives contribute the most to a safe working environment for on-the-job trained Zimbabwean construction semi-skilled workers?

To satisfy the sub-question, the results, analysis of data, interpretation and hypothesis testing is undertaken hereafter

5.6.6.1 Results

5.6.6.1.2 Significant sustainability learning objectives

Table 5.72: Ranking of the significance of sustainability learning objectives

(N=98) (P< 0.05= Significant)		Pearson Chi-Squared test				
Rank	Aspects	Test value	Degrees of freedom	P-value	Cramer's V	Asymp. Sig.
1	The learner knows relevant prevention strategies to foster positive physical and mental health well-being in the workplace	337.763 ^a	96	0.000	0.928	0.000
2	The learner is able to understand conservation strategies on construction sites	379.550 ^b	120	0.000	0.880	0.000
3	The learner knows conceptions of health, hygiene and well-being and can critically reflect on them.	301.823 ^c	96	0.000	0.877	0.000
4	The learner is able to identify their rights and clarify their values and needs related to work	296.706 ^d	96	0.000	0.870	0.000
5	The learner is able to facilitate improvements related to working conditions	290.771 ^e	96	0.000	0.861	0.000
6	The learner knows the socio-economic dimensions of health and well-being	288.223 ^f	96	0.000	0.857	0.000
7	The learner understands basic ecology and its importance on construction sites	351.310 ^g	120	0.000	0.847	0.000
8	The learner understands the concepts of decent work	347.323 ^h	120	0.000	0.842	0.000
9	The learner is able to communicate the need for sustainable practices in production	276.245 ⁱ	96	0.000	0.839	0.000
10	The learner knows the consequences to climate change	342.149 ^j	120	0.000	0.836	0.000
11	The learner is able to communicate the need for sustainable practices in production	201.736 ^k	96	0.000	0.717	0.000
12	The learner is able to publicly demand and support policies that promote social and economic justice	250.982 ^l	120	0.000	0.716	0.000

^a123 cells (98.4%) have expected count less than 5; ^b148 cells (98.7%) have expected count less than 5; ^c121 cells (96.8%) have expected count less than 5; ^d123 cells (98.4%) have expected count less than 5; ^e123 cells (98.4%) have expected count less than 5; ^f123 cells (98.4%) have expected count less than 5; ^g147 cells (98.0%) have expected count less than 5; ^h147 cells (98.0%) have expected count less than 5; ⁱ122 cells (97.6%) have expected count less than 5; ^j148 cells (98.7%) have expected count less than 5; ^k122 cells (97.6%) have expected count less than 5; ^l148 cells (98.7%) have expected count less than 5.

Respondents were requested to rate the significance of the sustainability learning objectives, given below, to ensure a safe working environment: where 1- not significant, 2 – of little significance, 3 – somewhat significant, 4 – significant, 5 –very significant, U – unsure. A Pearson chi-square goodness of fit test was undertaken on all rated sustainability learning objectives and all were determined to be significant towards ensuring a safe work environment for construction semi-skilled workers. The computed p-values for all the strategies was < 0.05 as shown in Table 5.72. The highest Cramer value, between 0 and 1, was considered to have the highest significance (Field, 2014: 743). Further to that, the Cramer values are highly significant since their $p < 0.001$, indicating that the values of the are unlikely to have happened if there was no association in the population.

5.6.6.2 Analysis of data

Analysis of data entailed correspondence analysis and normality tests before Pearson Chi-squared tests. The analysis is described hereafter.

5.6.6.2.1 Correspondence Analysis

Since it is erroneously perceived that Likert scales intervals are equidistant (Yelland, 2010: 2), re-scaling must be undertaken through correspondence analysis which re-scaled the 5-point Likert scale from ordinal to interval data (Nkado & Meyer, 2001: 485).

Table 5.73: Re-scaling of 5-point Likert scale for rating significance of sustainability learning objectives

	Response	Axis 1 co-ordinate	Axis 2 co-ordinate	Euclidean Distance	Adjusted 5-point scale
1	Not Significant	0.182	-0.062		1
2	Of little Significance	0.094	0.451	0.520	1.447
3	Somewhat Significant	0.284	0.162	0.346	1.744
4	Significant	1.121	-0.358	0.985	2.590
5	Very Significant	-1.681	-0.193	2.807	5

Table 5.73 presents the results of the re-scaling which show that the ordinal ratings are not interval in nature and thus accurate interpretation will be achieved through the use of the re-scaled ratings. Furthermore, the nature of Euclidean distances represents negative skewness due to the majority of respondents rating the corporate social responsibility strategies very highly as shown by the high values. Fielding (2014: 20) describes negative skewness as having frequent scores clustered at the higher ends and is characterised by high means. The ratings using the re-scaled 5-point scale were then considered for evaluating the computations undertaken for hypothesis 4.1.

5.6.6.2.2 Test of normality on sustainability learning objectives

Table 5.74 shows the results of the test for the normality of learning objectives. A non-significant result (sig value of more than 0.05) indicates normality (Ghasemi & Zahediasl, 2012: 486). SPSS provides the K-S (with Lilliefors correction) and the Shapiro-Wilk normality tests. Using both the Shapiro-Wilk and K-S test results, a sig value of less than 0.05 indicates that the data is not normally distributed. Therefore, the hypotheses will be computed using non-parametric tests such as the Chi-squared goodness of fit test, the Mann-Whitney and Kruskal-Wallis tests.

Table 5.74: Test of normality

Kolmogorov-Smirnova			Shapiro-Wilk		
Statistic	df	Sig.	Statistic	df	Sig.
0.139	98	0.000	0.789	98	0.000

5.6.6.3 Interpretation

The results show that all the learning objectives have a high association with Cramer's values more than 0.5 (Field, 2014: 743). Semi-skilled workers in Zimbabwe are very much in need of sustainability literacy to ensure a safe working environment. The unstructured on-the-job training schemes in the country make it difficult to ensure competent and consistent training. Henceforth, it is imperative the on-the-job training is formalised before any other interventions are implemented. On-the-job training of semi-skilled workers requires trainers that are also sustainability literate. The scope of remedial action is both extensive and intensive for this group of people.

The top 5 learning objectives, as shown in Table 5.72, for semi-skilled workers to ensure a safe working environment include: the learner knows relevant prevention strategies to foster positive physical and mental health well-being in the workplace; the learner is able to understand conservation strategies on construction sites; the learner knows conceptions of health, hygiene and well-being and can critically reflect on them; the learner is able to identify their rights and clarify their values and needs related to work, and the learner is able to facilitate improvements related to working conditions. These learning objectives are similar to those for skilled workers on aspects of physical and mental well-being and facilitation of improvements in the workplace.

Instruction on the identification of rights and clarification of needs related to work are essential for ensuring a safe work environment. Adhikari *et al.*, (2011: 75) motivates for

adequate training of decent work to workers to protect their rights and interests. Workers should be able to communicate their concerns on working environments that are not safe. Conservation strategies indirectly contribute to safe working environments as waste is a potential hazard. Such problems must be avoided by eliminating wasteful production and consumption patterns (Viertel, 2010: 222).

5.6.6.4 Hypothesis 4.1

For interpretation of the results, H_0 and H_1 are stated in statistical terms.

H_0 : *Training in socio-economic dimensions of well-being does not contribute the most to a safe working environment for on-the-job trained Zimbabwean construction semi-skilled workers*

H_1 : *Training in socio-economic dimensions of well-being contributes the most to a safe working environment for on-the-job trained Zimbabwean construction semi-skilled workers*

From Table 5.72, there is statistical evidence to support the null hypothesis as the learning objective with the most significant should have the highest Cramer's value. Therefore, training in socio-economic dimensions of well-being does not contribute the most to a safe working environment for on-the-job trained Zimbabwean construction semi-skilled workers.

5.6.7 Sub-question 4.2

What is the difference of perceptions, due to demographic variables, of construction site managers'/ project managers, training managers, construction semi-skilled workers and training managers on sustainability literacy objectives that contribute the most to a safe working environment for construction skilled workers?

To satisfy the sub-question, the results, analysis of data, interpretation and hypothesis testing is undertaken hereafter

5.6.7.1 Results

The results in Table 5.74 show that there was no statistically significant difference in the aggregate sustainability learning objectives through on-the-job training of semi-skilled workers with regards to age (0.561), gender (0.370), educational levels of respondents (0.079) and experience of respondents (0.467). However, designation (0.012) and showed a statistically significant difference since their p-value was < 0.05 .

Table 5.74: Summary of results on sustainability learning objectives

Sustainability Learning Objectives	Age (Sig.)	Gender (sig.)	Designation (Sig.)	Educational level (Sig.)	Experience (Sig.)
The learner is able to publicly demand and support policies that promote social and economic justice	0.300	0.000	0.007	0.020	0.780
The learner knows the concepts of health, hygiene and well-being and can critically reflect on them.	0.780	0.290	0.040	0.080	0.400
The learner knows the socio-economic dimensions of health and well-being	0.130	0.650	0.005	0.010	0.240
The learner knows the relevant prevention strategies to foster positive physical and mental well-being in the workplace.	0.270	0.970	0.002	0.010	0.900
The learner is able to communicate the need for energy efficiency and sufficiency.	0.810	0.440	0.440	0.660	0.830
The learner understands the concept of decent work.	0.410	0.260	0.612	0.440	0.110
The learner is able to facilitate any improvements related to the working conditions.	0.700	0.800	0.466	0.880	0.920
The learner is able to identify his rights and clarify his values and the needs related to work.	0.170	0.480	0.001	0.010	0.640
The learner is able to communicate the need for sustainable practices in production.	0.240	0.640	0.219	0.320	0.090
The learner knows the consequences of climate change	0.450	0.760	0.040	0.240	0.410
The learner understands basic ecology and its importance on construction sites.	0.570	0.650	0.051	0.100	0.340
The learner is able to understand conservation strategies on construction sites.	0.640	0.360	0.357	0.400	0.580
Average	0.561	0.370	0.012	0.079	0.467

Significance < 0.05

5.6.7.2 Analysis of data

Analysis of data entailed Mann-Whitney U tests and Kruskal-Wallis tests to ascertain significant differences due to demographic variables. The analysis considered the demographic variables separately and is explained hereafter.

5.6.7.2.1 Generation (Age)

The Kruskal-Wallis Test outputs on statistically significant differences between age categories are shown in Table 5.75. The Kruskal-Wallis test, as shown in Table 5.76, revealed that there was no statistically significant difference in the combined perceptions

on the significance of sustainability learning objectives in ensuring a safe working environment across 4 different age categories (n =2: Baby boomer; n =31: Generation X; n =64: Generation Y; n =1: Generation Z), average Chi-squared (3, n =98) =2.057, p =0.561.

Table 5.75: Kruskal-Wallis age ranks on sustainability learning objectives

Learning Objectives	Generation	N	Mean Rank
	Baby boomer	2	64.75
	Generation X	31	54.26
	Generation Y	64	46.77
	Generation Z	1	46.5
	Total	98	

Table 5.76: Kruskal-Wallis test age output on sustainability learning objectives

Learning Objectives	Chi-Square	df	Asymp. Sig.
	2.057	3	0.561

5.6.7.2.2 Gender

The Mann-Whitney U Test outputs on statistically significant differences between genders are shown in Table 5.77. The Mann-Whitney U Test, in Table 5.78, revealed that there is no statistically significant difference in the perceptions on the significance of sustainability learning objectives in ensuring a safe working environment of males (Median =4, n =88) and females (Median =3, n =10) with p =0.37.

Table 5.77: Mann-Whitney U gender ranks on sustainability learning objectives

Learning Objectives	Gender	N	Mean Rank	Sum of Ranks
	Male	88	50.38	4433
	Female	10	41.8	418
	Total	98		

Table 5.78: Mann-Whitney U test gender output on sustainability learning objectives

Learning Objectives	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
	363	418	-0.91	0.370

5.6.7.2.3 Designation

The Mann-Whitney U Test outputs on statistically significant differences between designations are shown in Table 5.79. The Mann-Whitney U Test, in Table 5.80, revealed that there is a statistically significant difference in the perceptions on the significance of

sustainability learning objectives in ensuring a safe working environment of managers (Median =4, n =54) and workers (Median =4, n =44) with $p = 0.012$.

Table 5.79: Mann-Whitney U designation ranks on sustainability learning objectives

Learning Objectives	Gender	N	Mean Rank	Sum of Ranks
	Managers	54	43.1	2327.5
	Workers	44	57.35	2523.5
	Total	98		

Table 5.80: Kruskal-Wallis test designation output on sustainability learning objectives

Learning Objectives	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
	836	2321	-2.521	0.012

5.6.7.2.4 Educational Levels

The Kruskal-Wallis Test outputs on statistically significant differences between education levels are shown in Table 5.81. The Kruskal-Wallis Test, in Table 5.82, revealed that there was no statistically significant difference in the combined perceptions on the significance of sustainability learning objectives in ensuring a safe working environment across the 4 different education levels (Level 1, n =15: Diploma; Level 2, n =39: Degree; Level 3, n =40: No Minimum Ordinary level; Level4, n =4: Minimum Ordinary Level), average Chi-squared (3, n =98) =6.776, $p=0.079$.

Table 5.81: Kruskal-Wallis educational level ranks on sustainability learning objectives

Learning Objectives	Education level	N	Mean Rank
	Diploma	15	46.97
	Degree	39	41.45
	No Minimum O levels	40	57.35
	Minimum O levels	4	59
	Total	98	

Table 5.82: Kruskal-Wallis test educational level output on sustainability learning objectives

Learning Objectives	Chi-Square	df	Asymp. Sig.
	6.776	3	0.079

5.6.7.2.5 Experience

The Kruskal-Wallis Test outputs on statistically significant differences between experience categories are shown in Table 5.83. The Kruskal-Wallis Test, in Table 5.84, revealed that

there was no statistically significant difference in the combined perceptions on the significance of sustainability learning objectives in ensuring a safe working environment across the 4 different experience categories (Experience 1, n =26: 1-5 years; Experience 2, n =39: 6-10 years; Experience 3, n =14: 11-15 years; Experience 4, n =19: 15+ years), average Chi-squared (3, n =98) =2.549, p =0.467.

Table 5.83: Kruskal-Wallis experience ranks on sustainability learning objectives

Learning Objectives	Experience	N	Mean Rank
	1-5 years	26	43.23
	6-10 years	39	51.42
	11-15 years	14	47
	15+	19	55.97
	Total	98	

Table 5.84: Kruskal-Wallis test experience output on sustainability learning objectives

Learning Objectives	Chi-Square	df	Asymp. Sig.
	2.549	3	0.467

5.6.7.3 Interpretation

The interpretation was done on learning objectives, shown in Table 5.74, for all sustainability learning objectives through on-the-job training of semi-skilled workers. The learning objective of “The learner is able to publicly demand and support policies that promote social and economic justice” had statistically significant differences due to the demographics of gender, designation and educational levels with p-values =0.00, 0.007, 0.02 respectively. For gender, as shown in Table 5.77, the males had a mean rank of 50.38 and median of 4 whilst females had a mean rank of 41.80 and median of 3. This shows that males have a greater need for instruction in this learning objective. This confirms the widely held claim that it is a male-dominated industry, and this further intensifies this view. With regards to the designation, Table 5.85 shows that managers rank this learning objective 12th, with a Cramer’s value of 0.766 whilst construction semi-skilled workers rank it 7th, with a Cramer’s value of 0.822. This shows that workers have a greater need for such instruction as it assists them to openly contribute to their workplace. For educational levels, as shown in Table 5.81, those with diplomas, degrees, no minimum ordinary levels and the minimum ordinary levels had a mean rank of 46.97, 41.45, 47.35 and 59 respectively. This shows that those with no minimum ordinary levels and the minimum ordinary levels have not been exposed to sustainability learning objectives during their secondary schooling, thus they had a much greater need for such instruction through on-the-job training.

The learning objective of “The learner knows the concepts of health, hygiene and well-being and can critically reflect on them.” had $p=0.04$ for the demographic aspect of designation, indicating a statistically significant difference. Table 5.85 shows managers ranking the learning objective 3rd, with a Cramer’s value of 0.919. Site and Project Managers ranked this learning objective significant whilst construction workers consider it insignificant due to a significance of 0.125 which is > 0.05 . Critically this objective should be significant for construction workers as it empowers them to ensure that their well-being is not violated or threatened by the employer’s organisation on construction sites. However, managers are more cognisant of its significance as both Teo, Ling and Ong (2005: 414) and Ricci *et al.*, (2016: 356) advocate for training in safe work practices, safety awareness campaigns and support for continuous improvement of occupational health and well-being as being critical to enhancing the well-being of construction workers.

Table 5.85: Comparison of site or project managers’ (SPM) semi-skilled construction workers’ (CSSW) ranking of sustainability learning objectives

Learning Objective	SPM			CSSW		
	Cramer’s Value	Asymp. Sig.	Rank	Cramer’s Value	Asymp. Sig.	Rank
The learner knows the relevant prevention strategies to foster positive physical and mental well-being in the workplace.	0.972	0.000	1	0.912	0.000	1
The learner is able to understand conservation strategies on construction sites.	0.935	0.000	2	0.787	0.001	10
The learner knows the concepts of health, hygiene and well-being and can critically reflect on them.	0.919	0.000	3	0.697	0.125	12
The learner is able to identify his rights and clarify his values and the needs related to work.	0.910	0.000	4	0.776	0.033	11
The learner knows the socio-economic dimensions of health and well-being	0.902	0.000	5	0.885	0.000	3
The learner understands the concept of decent work.	0.900	0.000	6	0.820	0.001	8
The learner is able to communicate the need for sustainable practices in production.	0.898	0.000	7	0.860	0.000	4
The learner is able to facilitate any improvements related to the working conditions.	0.860	0.000	8	0.894	0.000	2
The learner understands basic ecology and its importance on construction sites.	0.854	0.000	9	0.838	0.001	6
The learner knows the consequences of climate change	0.841	0.000	10	0.858	0.000	5
The learner is able to communicate the need for energy efficiency and sufficiency.	0.815	0.000	11	0.820	0.000	8
The learner is able to publicly demand and support policies that promote social and economic justice	0.766	0.005	12	0.822	0.001	7

Significance < 0.05

The learning objective of “The learner knows the socio-economic dimensions of health and well-being” had statistically significant differences due to the demographics of designation with $p\text{-value} = 0.005$. The learning objective of “The learner knows the relevant prevention strategies to foster positive physical and mental well-being in the workplace” statistically significant differences due to the demographics of designation with $p\text{-value} = 0.002$. The

learning objective of “The learner is able to identify his rights and clarify his values and the needs related to work” statistically significant differences due to the demographics of designation with $p\text{-value} = 0.001$. The learning objective of “The learner knows the consequences of climate change” had statistically significant differences due to the demographics of designation with $p\text{-value} = 0.04$. Table 5.85 shows that managers ranked the learning objective on “The learner knows the socio-economic dimensions of health and well-being” 5th, with a Cramer’s value of 0.902, whilst construction semi-skilled workers rank it 3rd, with a Cramer’s value of 0.885. This shows that workers have a greater need for such instruction as it affects them, their workplaces and their continued welfare. Such instruction is supported by Ahasan and Imbeau (2003: 123) when they reported that it allows construction workers to fully benefit through protection from work-related disorders that can render them economically incapacitated.

For the learning objective on “The learner knows the relevant prevention strategies to foster positive physical and mental well-being in the workplace” both managers and construction semi-skilled workers ranked it 1st, with a Cramer’s value of 0.972 and 0.912 respectively. Related to the objective on “The learner knows the socio-economic dimensions of health and well-being”, the construction workers are most affected by any illiteracy within this objective the most as their physical well-being can be potentially compromised due failure to protect themselves from adverse working conditions on construction sites. For the learning objective on “The learner is able to identify his rights and clarify his values and the needs related to work” managers ranked it 4th, with a Cramer’s value of 0.910, whilst construction semi-skilled workers rank it 11th, with a Cramers’ value of 0.776, as shown in Table 5.85. Contrary to the perceptions, construction workers are most in need of literacy that allows them to recognise their rights on construction sites. ILO (2018c: 28) support decent work in general, as it allows workers to contribute to the principle of equal opportunity and employees’ rights through encouraging increased utilisation of vulnerable workers. Thus, managers acknowledge more than workers concerning their work and workplaces, hence enhancing their welfare.

For the learning objective on “The learner knows the consequences of climate change” managers ranked it 10th, with a Cramer’s value of 0.841 whilst construction semi-skilled workers rank it 5th, with a Cramer’s value of 0.858, as shown in Table 5.85. Despite UNICEF (2012: 5) confirming the need to adjust existing training approaches so that learners are provided with the necessary knowledge to react to the climate change phenomenon, both designations have rated this learning objective low compared to the other objectives.

Despite this, construction workers have alluded more to its importance since Cruickshank and Fenner (2012: 251), Balliester and Elshaikhi (2018: 1) and ILO (2018c: 23) are unanimous on it transforming current working conditions regime through contributing to perpetual productivity losses due to the increased impact of natural hazards on the world of work, and this is one of the key megatrends, projected to play a major role, within the future of work.

The learning objective of “The learner knows the socio-economic dimensions of health and well-being” had statistically significant differences due to the demographics of educational level with $p\text{-value} = 0.01$. The learning objective “The learner knows the relevant prevention strategies to foster positive physical and mental well-being in the workplace” had statistically significant differences due to the demographics of educational level with $p\text{-value} = 0.01$. The learning objective “The learner is able to identify his rights and clarify his values and the needs related to work” had statistically significant differences due to the demographics of educational level with $p\text{-value} = 0.01$. According to Table 5.81, those with diplomas, degrees, no minimum ordinary levels and the minimum ordinary levels had a mean rank of 46.97, 41.45, 47.35 and 59 respectively. Again, this shows that those with no minimum ordinary levels and the minimum ordinary levels have not been exposed to sustainability learning objectives during their secondary schooling, thus they had a much greater need for such instruction through on-the-job training. Added to this, the importance of these learning objectives to construction workers cannot be over-emphasised as fundamental aspects of workers’ health, physical and mental well-being and rights need to be part of their training if their welfare is to be achieved.

5.6.7.4 Hypothesis 4.2

For interpretation of the results, H_0 and H_1 are stated in statistical terms.

H_0 : *Generation (Age), gender, designation, educational levels, and experience of construction site managers’/ project managers, training managers, construction skilled trade workers lead to significant differences of perceptions on sustainability learning objectives that contribute the most to a safe working environment for on-the-job trained construction skilled workers.*

H_1 : *Generation (Age), gender, designation, educational levels, and experience of construction site managers’/ project managers, training managers, construction skilled trade workers do not lead to significant differences of perceptions on sustainability learning*

objectives that contribute the most to a safe working environment for on-the-job trained construction skilled workers.

The results in Table 5.75, show there is statistical evidence to support the null hypothesis as the some of the demographic variables had significant differences where the average p-value < 0.05. The demographic variables of age, gender, educational levels and experience of construction site managers'/ project managers, training managers, construction skilled trade workers do not lead to significant differences of perceptions on sustainability learning objectives that contribute the most to a safe working environment for on-the-job trained construction skilled workers. However, the demographic variable of the designation of construction site/project managers, training managers, construction skilled trade workers leads to significant differences of perceptions on sustainability learning objectives that contribute the most to a safe working environment for on-the-job trained construction skilled workers.

5.7 PROVISION OF DECENT WORKING CONDITIONS

Establishing the required decent working conditions and incorporating them within the productivity measurement of various tasks assists in incorporating them within everyday tasks. Further to that, productivity outputs that are reflective of these conditions are generated and monitored on construction sites. Initially, respondents commented on these aspects and uncovered the current deficiencies within them. The results, analysis and interpretation from these interrogations are presented under each sub-heading. Consequent to that, the sub-question was responded to through hypothesis testing.

5.7.1 Site/project managers' perspectives on the influence of working conditions on ascertaining realistic productivity outputs

Site/project managers were asked to comment on the effect of failing to consider working conditions on ascertaining realistic productivity outputs. Of the 54 returned questionnaires, 48 (88.9%) of respondents had at least one comment while 6 (11.1%) did not comment. All the comments were collected as textual data and undertaken through meaning condensation, coded and categorised, as presented in Table 7.86 before inference was undertaken. ATLAS.ti 8 was utilised to aid analysis. Coding was undertaken by two coders and achieved reliability of 85%. The categorisation was aided by literature in section 3.3.4. (ILO, 2018: 15) allude to achieving welfare as being paramount it decency of work and Durdyev and Ismail (2016: 456) suggested the provision and control of convenient working

conditions as on of the most significant ways of raising productivity through management. Codification included achieving the welfare of workers (care of workers, the safety of workers and morale of workers) and productivity performance (monitoring and levels of productivity).

Table 5.86: Frequencies of categories

Example of comment	Code	Count	Category	Frequency
workers need to know that they are cared for	Care of workers	10	Achieving the welfare of workers	60.2%
workers will be afraid to get injured	Safety of workers	20		
it lowers the morale of workers	Morale of workers	20	Productivity performance	39.8%
Difficult to monitor and evaluate	Monitoring	6		
It results in reduced productivity	Levels of productivity	27		
	Total	83		100%

As shown in Table 7.86, achieving the welfare of workers (60.2%) and productivity performance (39.8%) are well represented in the responses of site/project managers. The responses are consistent with the analysis by ILO (2018e: 15) when they stated that construction sites in developing economies are characterised by the most precarious working conditions that include unsafe practices and unfair workloads for workers. The responses further align with Stamerra (2016: 515) when the author acknowledged that decent working conditions are directed towards the human aspect of work, are dignified and satisfactory to the worker, and hence are effective in determining productivity. The emphasis on the importance of working conditions on labour productivity by ILO (2018: 15) and ILO (2018b: 3, 4) is also justified by the responses. There is a need to exploit this appreciation by managers by structurally supporting them with resources to ensure the provision of adequate working conditions.

5.7.2 Construction skilled workers' perspective on the influence of working conditions on ascertaining realistic productivity outputs

Skilled and semi-skilled workers were requested to indicate the influence of working conditions on ascertaining realistic productivity outputs where; 1- very low extent, 2- low extent, 3- average, 4- high extent, 5- very high extent and U- Unsure.

Table 5.87: Rating influence of working conditions on ascertaining realistic productivity outputs

Indication of the influence of working conditions on realistic labour productivity outputs	U	1	2	3	4	5	Mean	Median
Skilled workers	0%	0%	0%	5%	60%	35%	4.30	4.00
Semi-skilled workers	0%	0%	2%	0%	75%	23%	4.19	4.00

Table 5.87 shows that more than half of skilled workers, 60% and the majority of semi-skilled workers, 75%, indicated that working conditions influence labour productivity to a high extent. This supports effective labour utilisation and soundness of planning through the provision of adequate working conditions. Decent working conditions are directed towards the human aspect of work, are dignified and satisfactory to the worker, and hence are effective in determining productivity. The emphasis on the importance of working conditions on labour productivity is justified by the responses of both managers and construction workers.

5.7.3 Sub-question 5.1

What are the significant decent working conditions that influence improved productive work for Zimbabwean construction skilled and semi-skilled workers?

To satisfy the sub-question, the results, analysis of data, interpretation and hypothesis testing is undertaken hereafter

5.7.3.1 Results

5.7.3.1.1 Significant decent working conditions

Respondents were requested to rate the significance of the decent working conditions, given below, to ensuring improved productive work: where 1- not significant, 2 – of little significance, 3 – somewhat significant, 4 – significant, 5 –very significant, u – unsure

Table 5.88: Ranking of significant decent working conditions

(N=98) (P< 0.05= Significant)		Pearson Chi-Squared test				
Rank	Decent working conditions	Test value	Degrees of freedom	P-value	Cramer's V	Asymp. Sig.
1	Provision of adequate occupational safety and health organization on sites	172.870 ^a	30	0.000	0.800	0.000
2	Satisfactory ergonomics on sites	191.877 ^f	45	0.000	0.799	0.000
3	Ensuring the maximum standard working time (44 hours per week) is adhered to for all workers	242.130 ^e	45	0.000	0.798	0.000
4	Provision of sufficient personal protective equipment for workers	258.523 ^b	45	0.000	0.773	0.000
5	Appropriate forecasting and planning for various climatic conditions	293.118 ^g	60	0.000	0.747	0.000
6	Provision of adequate work-related welfare facilities on construction sites	343.609 ^e	60	0.000	0.737	0.000
7	Satisfactory workplace conditions that enable enhanced worker efficiency	301.520 ^d	60	0.000	0.688	0.000

^a40 cells (83.3%) have expected count less than 5; ^b56 cells (87.5%) have expected count less than 5; ^c54 cells (84.4%) have expected count less than 5; ^d72 cells (90%) have expected count less than 5; ^e70 cells (87.5%) have expected count less than 5, ^f54 cells (84.4%) have expected count less than 5; ^g70 cells (87.5%) have expected count less than 5

. A Pearson chi-square goodness of fit test was undertaken to all the rated decent working conditions and all were determined to be significant towards improving productive work of construction skilled and semi-skilled workers. The computed p-values for all the strategies was < 0.05 , as shown in Table 5.88. The highest Cramer value, between 0 and 1, was considered to have the highest significance (Field, 2014: 743). Further to that, the Cramer values are highly significant since their $p < 0.001$, indicating that the values of the are unlikely to have happened if there was no association in the population.

5.7.3.2 Analysis of data

Analysis of data entailed correspondence analysis and normality tests before Pearson Chi-squared tests. The analysis is described hereafter.

5.7.3.2.1 Correspondence Analysis

Since it is erroneously perceived that Likert scales intervals are equidistant (Yelland, 2010: 2), re-scaling must be undertaken through correspondence analysis which re-scaled the 5-point Likert scale from ordinal to interval data (Nkado & Meyer, 2001: 485).

Table 5.89: Re-scaling of 5-point Likert scale for rating significance of decent working conditions

	Responses	Axis 1 co-ordinate	Axis 2 co-ordinate	Euclidean Distance	Adjusted 5-point scale
1	Not Significant	0	0		1
2	Of little Significance	-0.119	-0.036	0.124	1.116
3	Somewhat Significant	-0.174	0.405	0.444	1.529
4	Significant	-1.141	-0.231	1.157	2.604
5	Very Significant	1.435	-0.138	2.578	5

The results of the re-scaling, as in Table 5.89, show that the ordinal ratings are not interval in nature and thus accurate interpretation will be achieved through the use of the re-scaled ratings. Furthermore, the nature of Euclidean distances represents negative skewness due to the majority of respondents rating the corporate social responsibility strategies very highly. Field (2014: 20) describes negative skewness as having frequent scores clustered at the higher ends and is characterised by high means. The ratings using the re-scaled 5-point scale were then considered for evaluating the computations undertaken for hypothesis 5.1.

5.7.2.2 Test of normality on decent working conditions

Table 5.90 shows the results of the test for the normality of decent working conditions. A non-significant result (sig value of more than 0.05) indicates normality. SPSS provides the K-S (with Lilliefors correction) and the Shapiro-Wilk normality tests (Ghasemi & Zahediasl,

2012: 486). Using both the Shapiro-Wilk and K-S test results, a sig value of 0.00 indicates that the data is not normally distributed. Therefore, the hypotheses will be computed using non-parametric tests such as the Chi-squared goodness of fit test, the Mann-Whitney and Kruskal-Wallis tests.

Table 5.90: Test of normality

Kolmogorov-Smirnova			Shapiro-Wilk		
Statistic	df	Sig.	Statistic	df	Sig.
0.164	135	0.000	0.852	135	0.000

5.7.3.3 Interpretation

The results in Table 5.88 show that all the learning objectives have a high association with Cramer's values more than 0.5 (Field, 2014: 743). Decent working conditions are not only a requirement for all workplaces but they also can contribute to improved productivity. A construction worker whose welfare is enhanced is potentially more productive, as shown by the results. Therefore, it is important and beneficial that construction companies realise that achieving decent working conditions has a benefit of improving productivity and possibly profitability.

The decent working condition with the highest Cramer's value of 0.800, is the provision of adequate occupational safety and health organization on sites. Improving construction labour productivity is borne out of ensuring that occupational safety and health conditions are accorded the importance they deserve. The dual benefit of preserving human life and achieving high productivity is inevitable if construction companies in Zimbabwe inculcate this fundamental in their corporate strategies. Improving construction labour productivity is borne out of ensuring that occupational safety and health conditions are accorded the importance they deserve. Indeed, workers' health and well-being is a significant factor that affects labour productivity (Durdyev & Mbachu, 2017: 28). The lack of provision of these conditions by the construction companies will have disastrous consequences on productivity levels (Chigara & Moyo, 2014a: 62). De Silva and Wimalaratne (2012: 387) justify improving performance in the construction industry by adopting an occupational safety and health culture. This can be enhanced through initially integrating OSH legislation within a construction industry bill (Sherratt & Sherratt, 2017: 389, Chigara & Moyo, 2014b: 150). Nunez and Villanueva (2011: 66) and Hare and Cameron (2012: 193) concur on the importance of adequate safety and health conditions being pertinent to enhancing labour productivity on construction sites as reflected by the results. Recommendations by Oswald

et al., (2017: 370) to offer reward systems aligned to OSH can also be implemented. Thus, the resolution of OSH inadequacies guarantees productivity gains.

Related to this, promoting satisfactory ergonomics on construction sites is ranked 2nd on improving labour productivity on construction sites. Lack of awareness of ergonomics on construction sites detrimental, not only to the welfare of workers but also to the loss of productivity (Eaves, Gyi & Gibb, 2013: 101; Obiozo & Smallwood, 2014: 146; Adnan & Ressang, 2016: 190).

5.7.3.4 Hypothesis 5.1

For interpretation of the results, H0 and H1 are stated in statistical terms.

H0: Adequate occupational safety and health conditions do not influence improved productive work of Zimbabwean construction skilled and semi-skilled workers the most.

H1: Adequate occupational safety and health conditions influence improved productive work of Zimbabwean construction skilled and semi-skilled workers the most.

From Table 5.89, statistical evidence does not support the null hypothesis as the indicated decent working condition with the most significant has the highest Cramer's value of 0.800. Therefore, adequate occupational safety and health conditions influence improved productive work of Zimbabwean construction skilled and semi-skilled workers the most.

5.7.4 Sub-question 5.2

What is the difference of perceptions, due to demographic variables, of construction site managers'/ project managers' construction skilled trade workers on decent working conditions that lead the most to improved productive work for construction skilled and semi-skilled workers?

To satisfy the sub-question, the results, analysis of data, interpretation and hypothesis testing is undertaken hereafter

5.7.4.1 Results

The results show that there was no statistically significant difference in the aggregate decent working conditions with regards to age (0.086), gender (0.352) and experience of respondents (0.553). However, designation (0.00) and educational levels of respondents

(0.001) showed a statistically significant difference since their p-value was < 0.05. Table 5.91 summarises the null hypothesis test for all the decent working conditions.

Table 5.91: Summary of hypothesis test results on demographics

Decent Working Conditions	Age (Sig.)	Gender (sig.)	Designation (Sig.)	Educational levels (Sig.)	Experience (Sig.)
Provision of adequate occupational safety and health organisation on sites	0.890	0.830	0.150	0.100	0.260
Provision of sufficient personal protective equipment for workers	0.440	0.370	0.000	0.000	0.630
Ensuring the maximum standard Working time (44hrs per week) is adhered to for all workers	0.750	0.130	0.060	0.170	0.820
Satisfactory working conditions that enable enhanced worker efficiency	0.130	0.170	0.020	0.090	0.300
Provision of adequate work-related welfare facilities on construction sites	0.180	0.400	0.000	0.000	0.880
Satisfactory ergonomics on sites	0.110	0.680	0.010	0.050	0.490
Appropriate forecasting and planning for various climatic conditions	0.080	0.810	0.000	0.010	0.670
Average	0.086	0.352	0.000	0.001	0.553

*Significance < 0.05

5.7.4.2 Analysis of data

Analysis of data entailed Mann-Whitney U tests and Kruskal-Wallis tests to ascertain significant differences due to demographic variables. The analysis considered the demographic variables separately and is explained hereafter.

5.7.4.2.1 Generation (Age)

The Kruskal-Wallis Test outputs on statistically significant differences between age categories are shown in Table 5.92. The Kruskal-Wallis Test, in Table 5.93, revealed that there was no statistically significant difference in the combined perceptions on the significance of the decent working conditions in ensuring improved productive work across 4 different age categories (n =2: Baby boomer; n =54: Generation X; n =78: Generation Y; n =1: Generation Z), average Chi-squared (3, n =135) =6.605, p =0.086.

Table 5.92: Kruskal-Wallis age ranks on decent working conditions

Decent working conditions	Generation	N	Mean Rank
	Baby boomer	2	85
	Generation X	54	77.24
	Generation Y	78	60.83
	Generation Z	1	94.5
	Total	135	

Table 5.93: Kruskal-Wallis test age output on decent working conditions

Decent working conditions	Chi-Square	df	Asymp. Sig.
	6.605	3	0.086

5.7.4.2.2 Gender

The Mann-Whitney U Test outputs on statistically significant differences between genders are shown in Table 5.94. The Mann-Whitney U Test, in Table 5.95, revealed that there is no statistically significant difference in the combined perceptions on the significance of the decent working conditions in ensuring improved productive work of males (Median =4, n =116) and females (Median =4, n=19).

Table 5.94: Mann-Whitney U gender ranks on decent working conditions

Decent working conditions	Gender	N	Mean Rank	Sum of Ranks
	Male	116	69.25	8033.5
	Female	19	60.34	1146.5
	Total	135		

Table 5.95: Mann-Whitney U test gender output on decent working conditions

	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
Decent working conditions	956.5	1146.5	-0.93	0.352

5.7.3.3 Designation

The Mann-Whitney U Test outputs on statistically significant differences between designations are shown in Table 5.96. The Mann-Whitney U Test, Table 5.97, revealed that there is no statistically significant difference in the combined perceptions on the significance of the decent working conditions in ensuring improved productive work for managers (Median =4, n =54) and workers (Median =4, n =81).

Table 5.96: Mann-Whitney U designation ranks on decent working conditions

Decent working conditions	Gender	N	Mean Rank	Sum of Ranks
	Managers	54	51.74	2794
	Workers	81	78.84	6386
	Total	135		

Table 5.97: Mann-Whitney U test designation output on decent working conditions

Decent working conditions	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
	1309	2794	-3.983	0.000

5.7.3.4 Educational Levels

The Kruskal-Wallis Test outputs on statistically significant differences between education levels are shown in Table 5.98. The Kruskal-Wallis Test, in Table 5.99, revealed that there was no statistically significant difference in the combined perceptions on the significance of the decent working conditions in ensuring improved productive work across the 5 different education levels (Level 1, n =36: Certificate; Level 2, n =16: Diploma; Level 3, n =39: Degree; Level 4, n =38: Minimum Ordinary Level; Level 5, n=6: No Minimum Ordinary Level), average Chi-squared (4, n=135) = 19.995, p=0.001.

Table 5.98: Kruskal-Wallis educational level ranks on decent working conditions

Education level	N	Mean Rank
Decent working conditions	Certificate	75.58
	Diploma	67.47
	Degree	45.9
	Minimum Ordinary level	83.21
	No Minimum Ordinary level	71.25
	Total	135

Table 5.99: Kruskal-Wallis test educational level output on decent working conditions

	Chi-Square	df	Asymp. Sig.
Decent working conditions	19.995	4	0.001

However, since the Kruskal-Wallis test shows the statistically significant difference in the combined perceptions on the significance of decent working conditions that ensure improved construction labour productivity, it did not establish where the significant differences lie across the 5 different education levels. In such instances, Osei-Kyei and Chan (2017: 32) support the use of the Mann-Whitney U test on the significant strategies using a recalculated alpha value of 0.005 (0.05/10). Dividing by 10 relates to the number of

groups that emanate from the 5 different educational levels. Therefore, from Table 5.100, the following decent working conditions were considered: Provision of sufficient personal protective equipment for workers; Provision of adequate work-related welfare facilities on construction sites; and appropriate forecasting and planning for various climatic conditions.

Table 5.100: Mann-Whitney U Test results on significant decent working conditions

Decent working condition	Education Groups	Mann-Whitney U	Wilcoxon W	Z	r	Asymp. Sig. (2-tailed)
Provision of sufficient personal protective equipment for workers	Certificate & Degree	438.5	1218.5	-3.061	0.35	0.002
	Degree & Minimum O level	399	1179	-3.818	0.44	0.000
Provision of adequate work-related welfare facilities on construction sites	Degree & Minimum O level	394	1174	-4.324	0.49	0.000
Appropriate forecasting and planning for various climatic conditions	Certificate & Degree	448	1228	-3.045	0.35	0.002

Significance test value of 0.005

The results for the Mann-Whitney U test on decent working condition, as shown in Table 5.96, for provision of sufficient personal protective equipment for workers show that there is a significant difference between a certificate and degree holders and also between degree and those with the minimum ordinary level subjects required to have passed since the p-values of 0.002 and 0.000 are < 0.005 , $r = 0.35$ and 0.44 respectively. Field (2014: 225) states that the Mann-Whitney U test interpretation relies on scores being ranked from lowest to highest; thus, the lowest mean rank is the group with the greatest number of lower scores. According to Table 5.101, those with certificates had a higher mean rank of 45.32 compared to degree holders who had 31.24. This shows that certificate holders, who are predominantly skilled workers, view this condition as being more significant than the degree holders, who are predominantly site or project managers. The certificate holders view this condition as very necessary for enhancing construction labour productivity as compared to the degree holders. Again, for the same decent working condition, the degree holders have a mean rank of 30.10 whilst those with the minimum ordinary levels have a mean rank of 48.00. Despite the lack of relevant instruction for those with the minimum ordinary levels, they perceive that provision of sufficient personal protective equipment for workers is fundamental to enhancing construction labour productivity. Generally, the skilled and semi-skilled workers, with certificates and minimum ordinary levels, have a higher regard for this working condition compared to the degree holders.

Table 5.101: Mann-Whitney U test educational level ranks on selected decent working conditions

Decent working conditions	Education Group	N	Mean Rank	Sum of Ranks
Provision of sufficient personal protective equipment for workers	Certificate	36	45.32	1631.5
	Degree	39	31.24	1218.5
	Total	75		
	Degree	39	30.23	1179
	Minimum Ordinary levels	38	48.00	1824
	Total	77		
Provision of adequate work-related welfare facilities on construction sites	Degree	39	30.10	1174
	Minimum Ordinary levels	38	48.13	1829
	Total	77		
Appropriate forecasting and planning for various climatic conditions	Certificate	36	45.06	1622
	Degree	39	31.49	1228
	Total	75		

For “provision of adequate work-related welfare facilities” on construction sites, the results show that there is a significant difference between degree holders and those with the minimum ordinary levels since the p-value of 0.000 is < 0.005 , $r = 0.49$. According to Table 5.101, those with degree holders had a lower mean rank of 30.1 compared to those who with the minimum ordinary levels with 48.13. This shows that those with minimum ordinary levels, who are predominantly semi-skilled workers, view this condition as being more significant since they are affected the most than the degree holders, who are predominantly site or project managers.

For “appropriate forecasting and planning for various climatic conditions”, the results show that there is a significant difference between certificate holders and degree holders since the p-value of 0.002 is < 0.005 , $r = 0.35$. According to Table 5.101, those with certificate had a higher mean rank of 45.06 compared to those with a degree with 31.49. This shows that those with certificates, who are predominantly semi-skilled workers, view this condition as being more significant since they are affected the most than the degree holders, who are predominantly site or project managers.

5.7.3.5 Experience

The Kruskal-Wallis Test outputs on statistically significant differences between experience categories are shown in Table 5.102. The Kruskal-Wallis Test, in Table 5.103, revealed that there was no statistically significant difference in the combined perceptions on the significance of the decent working conditions in ensuring improved productive work across

the 4 different experience categories (Experience 1, n=33: 1-5 years; Experience 2, n=47: 6-10 years; Experience 3, n=23: 11-15 years; Experience 4, n=32: 15+ years), average Chi-squared (3, n=135) =2.093, p=0.553.

Table 5.102: Kruskal-Wallis experience ranks on decent working conditions

Experience		N	Mean Rank
Decent working conditions	1-5 years	33	59.67
	6-10 years	47	70.83
	11-15 years	23	68.96
	15+	32	71.75
	Total	135	

Table 5.103: Kruskal-Wallis test experience output on decent working conditions

	Chi-Square	df	Asymp. Sig.
Decent working conditions	2.093	3	0.553

5.7.4.3 Interpretation

The interpretation was undertaken for all the individual decent working conditions hereafter, with regards to their statistically significant differences. Demographics of educational level had a statistically significant difference in the following decent working conditions; Provision of sufficient personal protective equipment for workers, Provision of adequate work-related welfare facilities on construction sites and appropriate forecasting and planning for various climatic conditions. The mean ranks, as shown in Table 5.98, for the educational level designation: certificate =75.58; diploma =67.47; degree =45.9; minimum ordinary levels =83.21; and no ordinary levels= 71.25.

Demographics of designation had a statistically significant difference in the following decent working conditions; Satisfactory ergonomics on site, appropriate forecasting and planning for various climatic conditions, Provision of adequate work-related welfare facilities on construction sites, Satisfactory working conditions that enable enhanced worker efficiency and Provision of sufficient personal protective equipment for workers.

Satisfactory ergonomics on-site for workers was ranked 1st by managers with a Cramer's value of 0.857, whilst construction workers also ranked it 1st, with a Cramer's value of 0.937 as shown in Table 5.104. Though the condition is significant for both designations, construction workers rated it much higher than the managers. The advent of musculoskeletal and psychosomatic disorders in industrialized countries as new risks for workers is also a concern in developing countries like Zimbabwe (Coupand, 2017: 93).

However, the attempt to improve productivity through improved design systems should entail improved ergonomics for workers (Neumann *et al.*, 2006: 904).

Table 5.104: Comparison of site or project managers' (SPM) and skilled and semi-skilled construction workers' (CSSSW) ranking of decent working conditions

Decent work condition	SPM			CSSW		
	Cramer's Value	Asymp. Sig.	Rank	Cramer's Value	Asymp. Sig.	Rank
Satisfactory ergonomics on sites	0.857	0.000	1	0.937	0.000	1
Provision of adequate occupational health, safety and well-being requirements on sites	0.813	0.000	2	0.779	0.000	5
Ensuring the maximum standard working time (44 hrs. per week) is adhered to for all workers,	0.806	0.000	3	0.906	0.000	3
Appropriate forecasting and planning for various climatic conditions.	0.752	0.000	4	0.764	0.000	6
Provision of adequate work-related welfare facilities on construction sites,	0.731	0.000	5	0.753	0.000	7
Satisfactory workplace conditions that enable enhanced worker efficiency,	0.672	0.000	6	0.853	0.000	4
Provision of sufficient personal protective equipment for workers.	0.641	0.000	7	0.915	0.000	2

Significance < 0.05

“Appropriate forecasting and planning for various climatic conditions” was ranked 4th by both managers, with a Cramer’s value of 0.752, and 6th by construction workers with a Cramer’s value of 0.764, as shown in Table 5.104. Managers have a greater association with this condition, due to them undertaking these planning efforts. Further to that, companies are affected the most in situations of inclement weather, and lastly productivity generally reduces when conditions are not optimum (Mincks & Johnston, 2004: 193). In support of this, Sarode and Shirasath (2012: 2736) guarantee improved employee productivity through the provision of a comfortable work environment where workers are exposed to a proper range of temperature, adequate ventilation and adequate humidity. Hasan *et al.*, (2018: 932) and Durdyev and Ismail (2016: 456) reiterate that climatic conditions are one of the riskiest and significant factors that affect labour productivity on construction sites.

“Provision of adequate work-related welfare facilities on construction sites” was ranked 5th by managers, with a Cramer’s value of 0.731, whilst construction workers ranked it 7th, with a Cramer’s value of 0.753, as shown in Table 5.104. The results are consistent with these conditions mainly affecting workers in their work on construction sites. Managers are tasked with ensuring that these conditions are conducive for workers, however, they are not directly affected by their status. The ambiguity of the Zimbabwe Government (2013: 281) abates construction companies not to provide specific standardised work-related welfare facilities and thus lacklustre conditions culminate. However, for workers, Mincks and Johnston (2004: 213) report that the provision of adequate temporary facilities related to project requirements has a distinct impact on craftsperson productivity. Due to this favourable

advantage, managers within construction companies are encouraged to afford this decent working condition the attention that it deserves. Fundamentally, March (2009: 10) also recognises that productivity losses emanate from employees' attempts to access welfare facilities elsewhere, which is less prioritised by managers of construction sites.

"Satisfactory workplace conditions that enable enhanced worker efficiency," was ranked 6th by managers, with a Cramer's value of 0.672, whilst construction workers ranked it 4th, with a Cramer's value of 0.853, as shown in Table 5.104. Construction workers have a higher association with this decent working condition though the actual conditions are the prerequisite of site and project managers. Aboagye-Nimo & Emuze, (2017: 285) confirm that construction workers are more productive if managers uphold this responsibility. Satisfactory workplace conditions nurture workers and this leads to productivity advances (Sarode & Shirasath, 2012: 2737; Abrey & Smallwood, 2014: 7).

"Provision of sufficient personal protective equipment" for workers was ranked 7th by managers, with a Cramer's value of 0.672, whilst construction workers ranked it 4th, with a Cramer's value of 0.915, as shown in Table 5.104. Though the condition is significant for both designations, construction workers rated it much higher than the managers. Construction workers potentially reacted to the assertion by ILO (2018e, 20) that provision of personal protective equipment as merely a box-ticking exercise that is not effective in galvanising construction workers against site accidents. Thus, workers view this condition as pertinent to them enhancing construction labour productivity on construction sites.

5.7.4.4 Hypothesis 5.2

For interpretation of the results, H0 and H1 are stated in statistical terms.

H0: Generation (Age), gender, designation, educational levels and experience of construction site managers'/ project managers' construction skilled trade workers lead to significant differences of perceptions on decent working conditions that lead the most to improved productive work for construction skilled workers.

H1: Generation (Age), gender, designation, educational levels and experience of construction site managers'/ project managers' construction skilled trade workers do not lead to significant differences of perceptions on decent working conditions that lead the most to improved productive work for construction skilled workers.

The results in Table 5.92, there is statistical evidence to support the null hypothesis as some of the demographic variables had significant differences where the average p-value < 0.05. The demographic variables of age, gender and experience of construction site managers'/ project managers' construction, skilled trade workers do not lead to significant differences of perceptions on decent working conditions that lead the most to improved productive work for construction skilled workers. However, the demographic variables of designation and educational levels of construction site managers'/ project managers' construction skilled trade workers lead to significant differences of perceptions on decent working conditions that lead the most to improved productive work for construction skilled workers.

5.8 Indicators for sustaining construction labour productivity

The results, analysis and interpretation from the interrogations on the understanding and need for sustaining construction labour productivity are presented under each sub-heading.

5.8.1 Understanding labour productivity performance measurement

Site/project managers, educators and regulators were asked to comment on their understanding of labour productivity performance measurement. Of the 86 returned questionnaires, 79 (91.8%%) of respondents had at least one comment while 7 (8.2%) did not comment. All the comments were collected as textual data and undertaken through meaning condensation, coded and categorised, as presented in Table 5.105 before inference was undertaken. ATLAS.ti 8 was utilised to aid analysis. Coding was undertaken by two coders and achieved a reliable percentage of agreement of 90%. The categorisation was aided by literature in section 2.2.3 and 3.3.5. Piercy and Rich (2015: 288) refer to workforce issues as being critical. Performance improvement should be accompanied by competitiveness (Despotovic *et al.*, 2015: 1). Categorisation and codification included factors affecting workers (task output and skills levels) and performance appraisal (monitoring indicators and corrective action).

Table 5.105: Frequencies of categories

Example of comment	Code	Count	Category	Frequency
Time for completing a task	Task output	42	Worker performance	57.6%
Reflects the skills of workers	Skills levels	7		
Achieving set objectives on set targets	Monitoring indicators	35	Performance appraisal	42.4%
Its purpose is to constantly improve in grey areas	Corrective action	1		
	Total	85		100%

Hogevold *et al.*, (2015: 436) and Despotovic *et al.*, (2015: 1) reported that the promotion of competitiveness should achieve desirable changes. The results in Table 5.105, show worker performance (57.6%) and performance appraisal (42.4%) being significant within the respondents' understanding. However, the low understanding of the corrective action is of concern. Performance measurement's importance can not be overemphasised, however, without corrective action, very little is achieved. Robinson *et al.*, (2005: 13) relay that clients, investors and other stakeholders are demanding continuous performance improvement and this can only be realised through corrective action in performance appraisal.

Performance measurement ensures that every aspect of the company, including manpower related factors, are critically analysed to improve on efficiency and effectiveness. Hogevold *et al.*, (2015: 438) report that businesses are measured for them to be strengthened. This is consistent with the responses on the understanding of labour productivity performance measurement where the respondents referring to task output and monitoring and evaluation.

5.8.2 Need for sustaining labour productivity

Site/project managers, educators and regulators were asked to comment on their insights on the need for sustaining labour productivity. Of the 86 returned questionnaires, 72 (83.7% of respondents had at least one comment while 14 (16.3%) did not comment. All the comments were collected as textual data and undertaken through meaning condensation, coded and categorised, as presented in Table 5.106 before inference was undertaken. ATLAS.ti 8 was utilised to aid analysis. Coding was undertaken by two coders and achieved a reliable percentage of agreement of 80%. The categorisation was aided by literature in section 3.3.5. Continuous performance improvement and sustainability practice are increasingly being demanded by construction stakeholders, including construction workers (Robinson, *et al*, 2005: 13; Hogevold *et al.*, 2015: 436). Categorisation and codification included worker-related aspects (sustainable practices, skills development and employee well-being) and performance improvement (minimisation of resources and productivity levels). The results show that the responses are skewed towards performance improvement (79.8%) as compared to worker-related aspects (20.2%). These responses correspond to the respondents understanding of labour productivity performance measurement. This is contrary to global views on the need for sustaining construction productivity which includes the need to ascertain decency of work.

Table 5.105: Frequencies of categories

Example of comment	Code	Count	Category	Frequency
Increased economic and social growth of a company	Sustainable practices	7	Welfare of workers	20.2%
Equips workers with new skills	skills development	5		
Increased workers' motivation	Workers well-being	5		
Minimisation of costs	Minimisation of resources	30	Performance improvement	79.8%
Leads to improved productivity levels	productivity levels	37		
	Total	84		100%

This strongly advocates for the implementation of productivity measurement centres in Zimbabwe which are aligned to achieving decent work. Respondents could not fully explain the need as they generally focused on the general economic expectations rather than including all the dimensions. Mariappanadar (2012: 168) justifies the inclusion of human resources within the context and reports that they must be managed sustainably to ensure a positive impact on communities.

The social dimension is also as important within the need for sustaining construction labour productivity. Almahmoud and Doloï, (2015: 153) reports that the social aspect in developing countries has been neglected with issues of inequity, health problems, poverty and illiteracy dominant. Murray and Cotgrave, 2007: 9) also suggest that the vision of an equitable, safe and healthy future for mankind remains paramount in any discourse.

5.9 Chapter Summary

This chapter reported on the response rate for the study where an acceptable rate of 78.4% is was achieved. The profile of the respondents was also considered, where the demographic variables of the study were presented and interpreted. The generation (age), gender, designation, educational levels and experience of the respondents were representative of the study population and this enabled generalisation of results. The profile of the construction companies, that included, their category, their experience and the sites considered were also considered and representativeness was confirmed.

The objectives of the study were interrogated with initially considering pertinent background aspects before the hypotheses tests were undertaken. For each objective under consideration correspondence analysis was undertaken to ensure that the scaling for the responses was ordinal and not interval. Tests of normality, Pearson Chi-squared tests and

Cramer's Value, Ranking, Mann-Whitney U tests and Kruskal Wallis tests were undertaken to satisfy the objectives.

CHAPTER 6: MODEL DEVELOPMENT

6.1 INTRODUCTION

This chapter reports on the steps towards developing the model. After the indicators were rated, data aggregation was undertaken to consider them within their substantive elements. Causality was established and the weights of demographic variables assigned resulting in the derivation of regression models for performance measurement for sustaining construction labour productivity. Short and long-term interventions were generated and the validation of regression models was done using cross-validation and secondary data.

6.2 INDICATORS FOR SUSTAINING CONSTRUCTION LABOUR PRODUCTIVITY PERFORMANCE

6.2.1 Correspondence Analysis

Since it is erroneously perceived that Likert scales intervals are equidistant (Yelland, 2010: 2), re-scaling must be undertaken through correspondence analysis which re-scaled the 5-point Likert scale from ordinal to interval data (Nkado & Meyer, 2001: 485).

Table 6.1: Re-scaling of 5-point Likert scale for rating significance of indicators

	Responses	Axis 1 co-ordinate	Axis 2 co-ordinate	Euclidean Distance	Adjusted 5-point scale
1	Not Significant	-0.135	-0.328		1
2	Of little Significance	0.333	0.057	0.606	1.362
3	Somewhat Significant	0.609	-0.885	0.982	1.947
4	Significant	-1.652	0.201	2.508	3.443
5	Very Significant	0.846	0.955	2.609	5

The results of the re-scaling, as in Table 6.1, show that the ordinal ratings are not interval in nature and thus accurate interpretation will be achieved through the use of the re-scaled ratings. Furthermore, the nature of Euclidean distances represents a normal distribution.

6.2.2 Test of normality on indicators

The results of the test for the normality of indicators was undertaken. A non-significant result (sig. value of more than 0.05) indicates normality of 0.052 and 0.062 for both the Kolmogorov-Smirnova test and the Shapiro-Wilk (Ghasemi & Zahediasl, 2012: 486). Therefore, the hypothesis was computed using parametric tests, namely the Pearson bivariate correlation method and Regression analysis.

6.2.3 Ranking of Substantive elements

Table 6.2: Ranking of Substantive elements and indicators

Rank	Substantive element	Indicator	Mean	Average mean
1.	Adequate earnings and productive work	Employees with recent job training	4.221	4.221
2.	Environmental context	Environmental impact of labour administration	4.163	4.163
3.	Safe work environment	Occupational injury frequency rate (fatal and non-fatal)	3.919	3.989
		Time lost due to occupational injuries	4.056	
4.	Employment opportunities	Labour force participation rate	4.267	3.961
		Employment by status in employment	3.826	
		Labour underutilisation	3.791	
5.	Economic and social context for decent work	Labour productivity (Gross Domestic Product per employed person, level, and growth rate)	4.058	3.892
		Income inequality	3.733	
		Sustainable literacy levels	3.885	
6.	Combining work, family and personal life	Unusual hours	3.511	3.651
		Maternity protection	3.791	
7.	Social dialogue, workers' and employers' representation	Trade union density rate	3.279	3.643
		Collective bargaining coverage rate	3.872	
		Days missed due to strikes and lockout	3.779	
8.	Decent working time	Employment with excess working time (44 hours per week)	3.849	3.589
		Time-related underemployment rate	3.035	
		Paid annual leave	3.884	
9.	Stability and security of work	Precarious employment rate	3.267	3.361
		Subsistence worker rate	3.454	
10.	Social security	Share of population above pensionable age benefiting from pension	3.209	3.353
		Public social security expenditure (proportion of Gross Domestic Product)	3.256	
		Share of economically active population contributing to a pension scheme	3.593	
11.	Work that should be abolished	Forced labour rate	3.314	3.314
12.	Equal opportunity and treatment in employment	Occupational segregation by sex	3.267	3.274
		A measure of discrimination (by ethnicity, of indigenous people)	3.279	

Respondents were requested to rate the significance of given indicators, for sustaining construction labour productivity: where 1- not significant, 2 – of little significance, 3 – somewhat significant, 4 – significant, 5 –very significant, U – Unsure. Respondents rated individual statistical indicators, however, analysis grouped all the indicators into substantive elements. The indicators selection and grouping process were subjective and qualitative. The confines of this framework are the decent work agenda, and further to this, the economic and social context and environmental dimension were incorporated into the whole matrix as suggested by ILO (2013: 13). Therefore 12 substantive elements were reviewed concerning the Zimbabwean context. The data aggregation method where the responses for each indicator were considered to form the final score for the substantive elements or dimension as shown in Table 6.2.

The results show that the top 3 selected indicators were the labour force participation rate (4.267), employees with recent job training (4.221) and environmental impact of labour (4.163). The importance of the labour force participation rate is consistent with developing countries, who have suppressed economic growth and very high levels of unemployment like Zimbabwe (Zimbabwe National Employment Policy Framework, 2009). Related to that, employees with recent job training is consistent with manpower related challenges that are affecting the Zimbabwean construction industry (Chigara *et al.*, 2013; Chigara & Moyo, 2014a; Mhlanga, 2018). The environmental impact of labour administration is a noteworthy finding, considering these are key issues that should be addressed in work environments (ILO, 2018d). The average means enabled an analysis to be made within the substantive elements and guarded against the selection of indicators that measured the same element.

6.2.4 Correlational analysis

The research hypothesis that considered whether comprehensive indicators for sustaining construction labour productivity performance could be developed through consultations with construction stakeholders, was tested through the Pearson bivariate correlation method. The results in Table 6.3, show selection of significant substantive elements concerning demographic variables of gender, generation, designation, educational level and experience of respondents. The two-tailed test of significance level was used to assess and investigate any causality where only variables that had significant (<0.05) variations between the substantive indicator variables and the demographic variables were selected for further analysis (Shayib, 2013: 239).

Table 6.3: Correlation analysis of substantive elements

Substantive element		Gender	Generation (Age)	Designation	Education level	Experience
Employment opportunities	Corr.	0.025	-0.108	-0.108	0.063	0.123
	Sig.	0.818	0.321	0.321	0.563	0.258
Adequate earnings and productive work	Corr.	-0.041	-0.266	0.314	-0.94	-0.40
	Sig.	0.710	0.013	0.003	0.388	0.716
Decent working time	Corr.	0.024	-0.37	-0.209	0.77	0.035
	Sig.	0.826	0.733	0.058	0.481	0.747
Combining work, family and personal life	Corr.	0.085	0.004	-0.273	0.342	0.57
	Sig.	0.437	0.972	0.011	0.001	0.602
Work that should be abolished	Corr.	-0.039	-0.176	-0.095	0.173	0.090
	Sig.	0.724	0.105	0.383	0.112	0.411
Stability and security of work	Corr.	-0.000	0.058	-0.287	0.117	0.067
	Sig.	0.940	0.595	0.007	0.285	0.538
Equal opportunity and treatment in employment	Corr.	-0.20	0.027	0.062	-0.005	0.058
	Sig.	0.854	0.805	0.573	0.964	0.595
Safe work environment	Corr.	0.191	-0.019	-0.068	0.181	0.021
	Sig.	0.079	0.865	0.536	0.096	0.846
Social security	Corr.	-0.007	-0.039	-0.216	0.470	0.055
	Sig.	0.951	0.721	0.046	0.665	0.612
Social dialogue, workers' and employers' representation	Corr.	-0.051	0.038	-0.109	0.046	0.021
	Sig.	0.644	0.724	0.316	0.677	0.846
Economic and social context for decent work	Corr.	0.119	0.022	-0.201	0.002	0.043
	Sig.	0.277	0.843	0.064	0.986	0.691
Environmental context	Corr.	0.073	0.059	0.235	0.111	-0.021
	Sig.	0.503	0.592	0.029	0.309	0.845

Corr.-correlation

Sig. - significance

Besides establishing the relationship, the direction of the relationship that is the sign was determined. Shayib (2013: 239) posits that positive relationship refers to the positive connection between demographic variable and group indicator variables i.e. when we move from one demographic variable to another (arranged in the ordinal form), the indicator values increases. Further to this, negative relationship refers to the negative connection

between demographic variable and indicator variables i.e. when we move from one demographic variable to another (arranged in the ordinal form), the indicator values decreases. Table 6.3 shows the results of correlation analysis of substantive elements. Italicised values are for Pearson correlation and regular values are for significance (two-tailed). Significance and correlation were determined between adequate earnings and productive work and age (-) and designation (+); Combining work, family and personal life and designation (-) and education level (+); Stability and security of work and designation (-); social security and designation (-); and environmental context and designation (+). These results thus, accept the null hypothesis that “Comprehensive sustainability indicators for construction labour productivity performance can be developed through consultations with construction stakeholders”.

6.2.5 Hypothesis 6

For interpretation of the results, H0 and H1 are stated in statistical terms.

H0: Comprehensive indicators for sustaining construction labour productivity performance cannot be developed through consultations with, and demographic considerations of, construction stakeholders.

H1: Comprehensive indicators for sustaining construction labour productivity performance can be developed through consultations with, and demographic considerations of, construction stakeholders.

From Table 6.3, statistical evidence does not support the null hypothesis, as the significant indicators with p-values < 0.05 were developed. Therefore, comprehensive indicators for sustaining construction labour productivity performance can be developed through consultations with construction stakeholders and considering their demographic variables.

6.3 REGRESSION ANALYSIS AND INTERPRETATION OF MODELS

Regression was utilised to assign weights to the significant demographic variables. Weights were considered where there were two or more independent variables. The values of the weights vary in an interval [0, 1] (Shayib, 2013: 240). The type of causality or relationship (negative or positive) determines the value of the strengths. The derived models were also interpreted with regards the statistical indicators within the substantive elements and the

associated demographic variables. From the analysis, statistically significant regression models were found as:

6.3.1 Model 1

Table 6.3 shows designation and generation as significant demographic variables. The constituent weighting for Adequate earnings and productive work is generation (weight = 0.403) & designation (weight = 0.597). The model summary in Table 6.4 shows the R-value of 0.349, which shows the correlation between adequate earnings and productive work and the demographic variables of designation and generation. The value of R^2 is 0.122, which tells us that the demographic variables of designation and generation can account for 12.2% of the variation in inadequate earnings and productive work. However, 87.8% of the variation inadequate earnings and productive work cannot be explained by designation and generation alone. However, we need to consider the designation and generation of construction stakeholders to explain any gains or losses in sustaining construction labour productivity through the substantive element of adequate earnings and productive work.

Table 6.4: Model summary for adequate earnings and productive work

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.349 ^a	0.122	0.101	0.51224
a. Predictors: (Constant), Designation, Generation				

In the variance analysis in Table 6.5, the sum of squared residuals and the sum of squared errors that were explained by the regression equation is shown. The results show that there is less than 5% chance that an F-ratio this large would happen if the null hypothesis were true.

Table 6.5: Analysis of variance for adequate earnings and productive work

ANOVA ^a						
Model 1		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.024	2	1.512	5.762	0.005 ^b
	Residual	21.779	83	0.262		
	Total	24.802	85			
a. Dependent Variable: Adequate Earnings and Productive Work						
b. Predictors: (Constant), Designation, Generation						

Therefore, we can conclude that our regression model results in significantly better prediction of adequate earnings and productive work than if we used the mean value of

adequate earnings and productive work. Thus, this regression model predicts adequate earnings and productive work well. The regression model that is statistically significantly (Sig.< 0.05) is given in Table 6.6. The predictor variable of generation shows a significance value of 0.142, which is > 0.05, but due to multicollinearity. Field (2014: 324) states that when two predictor variables are perfectly correlated, the values of B for each variable are interchangeable.

Table 6.6: Coefficients for adequate earnings and productive work

Model 1	Unstandardised coefficients		Unstandardised coefficients		
	B	Std. Error	Beta	t	Sig.
Constant	4.447	.315		14.130	0.000
Generation	-0.158	.107	-0.167	-1.483	0.142
Designation	0.092	.042	0.247	2.199	0.031

The resulting regression model equation is given by the equation shown below;

$$Y = 0.092 * X_1 - 0.158 * X_2 + 4.447$$

Where *Y* – Adequate earnings and productive work, *X*₁ – Designation, *X*₂ – Generation

6.3.2 Model 2

Table 6.3 shows designation and educational levels as significant demographic variables. The constituent weighting for Combining work, family and personal life is designation (weight = 0.433) & educational level (weight = 0.567). The model summary in Table 6.7 shows the R-value of 0.420, which shows the correlation between combining work, family and personal life and the demographic variables of designation and educational levels. The value of R² is 0.176, which tells us that the demographic variables of designation and educational levels can account for 17.6% of the variation in combining work, family and personal life. However, 82.4% of the variation in combining work, family and personal life cannot be explained by designation and educational levels alone. However, we need to consider the designation and educational levels of construction stakeholders to explain any gains or losses in sustaining construction labour productivity through the substantive element of combining work, family and personal life.

Table 6.7: Model summary for combining work, family and personal life

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
2	0.420 ^a	0.176	0.157	1.96255
a. Predictors: (Constant), Education level, Designation				

In the variance analysis in Table 6.8, the sum of squared residuals and the sum of squared errors that were explained by the regression equation is shown. The results show that there is less than 5% chance that an F-ratio this large would happen if the null hypothesis were true. Therefore, we can conclude that our regression model results in significantly better prediction of combining work, family and personal life than if we used the mean value of combining work, family and personal life. Thus, this regression model predicts combining work, family and personal life well.

Table 6.8: Analysis of variance for combining work, family and personal life

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	68.456	2	34.228	8.887	0.000 ^b
	Residual	319.683	83	3.852		
	Total	388.140	85			
a. Dependent Variable: Combining Family, Work and Personal life						
b. Predictors: (Constant), Education level, Designation						

The regression model that is statistically significantly (Sig. < 0.05) is given in Table 6.9. The predictor variables of designation and educational generation show significance values of 0.017 and 0.002 respectively, which is < 0.05.

Table 6.9: Coefficients for combining work, family and personal life

Model 2	Unstandardised coefficients		Unstandardised coefficients		
	B	Std. Error	Beta	t	Sig.
Constant	4.674	1.115		4.192	0.000
Designation	-0.359	0.147	-0.244	-2.444	0.017
Educational Levels	1.248	0.390	0.320	3.200	0.002

The resulting regression model is given by the equation shown below;

$$Y = -0.359 \cdot X_1 + 1.248 \cdot X_2 + 4.674$$

Where *Y* – Combining work, family and personal life, *X*₁ – Designation, *X*₂ – Education Level

6.3.3 Model 3

Since Table 6.3 shows designation as a significant demographic variable for stability and security of work. The model in Table 6.10 shows the R-value of 0.287, which shows the correlation between stability and security of work and the demographic variable of designation. The value of R^2 is 0.082, which tells us that the demographic variable of designation can account for 8.2% of the variation in stability and security of work. However, 91.8% of the variation in stability and security of work cannot be explained by designation alone. Though, we need to consider the designation of construction stakeholders to explain any gains or losses in sustaining construction labour productivity through the substantive element of stability and security of work.

Table 6.10: Model summary for stability and security of work

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
3	0.287 ^a	0.082	0.071	2.59266
a. Predictors: (Constant), Designation				

In the variance analysis in Table 6.11, the sum of squared residuals and the sum of squared errors that were explained by the regression equation is shown. The results show that there is less than 5% chance that an F-ratio this large would happen if the null hypothesis were true. Therefore, we can conclude that our regression model results in significantly better prediction of stability and security of work than if we used the mean value of stability and security of work. Thus, this regression model predicts the stability and security of work well.

Table 6.11: Analysis of variance for stability and security of work

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	50.664	1	50.664	7.537	0.007 ^b
	Residual	564.638	84	6.722		
	Total	615.302	85			
a. Dependent Variable: Stability and Security of work						
b. Predictors: (Constant), Designation						

The regression model that is statistically significantly (Sig.< 0.05) is given in Table 6.12. The predictor variable of designation shows a significance value of 0.007, which is < 0.05.

Table 6.12: Coefficients for stability and security of work

Model 3	Unstandardised coefficients		Unstandardised coefficients		
	B	Std. Error	Beta	t	Sig.
Constant	7.726	0.461		16.770	0.000
Designation	-0.530	0.193	-0.287	-2.745	0.007

The resulting regression model is given by the equation shown below;

$$Y = -0.530 \cdot X_I + 7.726$$

Where Y – *Stability and Security of work*, X_I – *Designation*

6.3.4 Model 4

Since Table 6.3 shows designation as a significant demographic variable for Social security. The model in Table 7.13 shows the R-value of 0.216, which shows the correlation between social security and the demographic variable of designation. The value of R² is 0.046, which tells us that the demographic variable of designation can account for 4.6% of the variation in social security. However, 95.4% of the variation in social security cannot be explained by designation alone. Though, we need to consider the designation of construction stakeholders to explain any gains or losses in sustaining construction labour productivity.

Table 6.13: Model summary for social security

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.216 ^a	0.046	0.035	3.44373
a. Predictors: (Constant), Designation				

In the variance analysis in Table 6.14, the sum of squared residuals and the sum of squared errors that were explained by the regression equation is shown.

Table 6.14: Variance analysis for social security

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	48.528	1	48.528	4.092	0.046 ^b
	Residual	996.181	84	11.859		
	Total	1044.709	85			
a. Dependent Variable: Social Security						
b. Predictors: (Constant), Designation						

The results show that there is less than 5% chance that an F-ratio this large would happen if the null hypothesis were true. Therefore, we can conclude that our regression model results in significantly better prediction of social security than if we used the mean value of social security. Thus, this regression model predicts social security well. The regression model that is statistically significantly (Sig.< 0.05) is given in Table 6.15. The predictor variable of designation shows a significance value of 0.046, which is < 0.05.

Table 6.15: Coefficients for social security

Model 4	Unstandardised coefficients		Unstandardised coefficients		
	B	Std. Error	Beta	t	Sig.
Constant	11.042	0.612		18.044	0.000
Designation	-.519	0.257	-.216	-2.023	0.046

The resulting regression model is given by the equation shown below;

$$Y = -0.519 \cdot X_1 + 11.042$$

Where Y – Social Security, X_1 – Designation

6.3.5 Model 5

Since Table 6.3 shows designation as a significant demographic variable for Environmental context. The model in Table 6.16 shows the R-value of 0.235, which shows the correlation between environmental context and the demographic variable of designation. The value of R^2 is 0.055, which tells us that the demographic variable of designation can account for 5.5% of the variation in the environmental context. However, 94.5% of the variation in environmental context cannot be explained by designation alone. Though, we need to consider the designation of construction stakeholders to explain any gains or losses in sustaining construction labour productivity through the environmental context substantive element.

Table 6.16: Model summary for environmental context

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.235 ^a	0.055	0.044	0.92280
a. Predictors: (Constant), Designation				

In the variance analysis in Table 6.17, the sum of squared residuals and the sum of squared errors that were explained by the regression equation is shown. The results show that there is less than 5% chance that an F-ratio this large would happen if the null hypothesis were true. Therefore, we can conclude that our regression model results are a significantly better prediction of environmental context than if we used the mean value of the environmental context. Thus, this regression model predicts environmental context well.

Table 6.17: Variance analysis for environmental context

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.189	1	4.189	4.920	0.029 ^b
	Residual	71.532	84	0.852		
	Total	75.721	85			
a. Dependent Variable: Environmental Context						
b. Predictors: (Constant), Designation						

The regression model that is statistically significantly (Sig.< 0.05) is given in Table 6.18. The predictor variable of designation shows a significance value of 0.029, which is < 0.05.

Table 6.18: Coefficients for environmental context

Model 4	Unstandardised coefficients		Unstandardised coefficients		
	B	Std. Error	Beta	t	Sig.
Constant	3.874	0.164		23.622	0.000
Designation	0.153	0.069	0.235	2.218	0.029

The resulting regression equation is given by the equation shown below;

$$Y = 0.153 * X_1 + 3.874$$

Where Y – *Environment Context*, X_1 – *Designation*

6.4 MODEL FORMULATION AND INTERPRETATION

The model in Figure 6.1 is constituted by construction labour productivity determinants that are pertinent to the Zimbabwean construction industry and whose resolution is based on addressing substantive elements located in the decent work agenda. These individually contribute to sustaining construction labour productivity by addressing statistically significant differences due to demographic variables. Further to that, they cumulatively contribute to a wider analysis on all the substantive elements, within decent work, and how

statistically significant differences due to demographic variables can be modelled for short and long-term interventions.

6.4.1 Short- and long-term interventions

The regression models determined show statistically significant demographic variables concerning various substantive elements, which were derived from the decent work agenda, which require short and long-term interventions. The nature of the demographic differences and the nature of dependent variables under study differentiate whether short or long-term interventions are required.

Short-term interventions are required where the significant differences are project-based and hence the magnitude of resolutions are project-based. Statistical significance shown in hypotheses 1.2, 2.2, 3.2, 4.2, 5.2 and 6 recognises demographic variables that require short-term interventions. The responses from site or project managers and construction workers exposed the construction site deficiencies concerning pre-determined substantive elements of social security, adequate productive work, adequate employment treatment and safe working environment. The demographic variable of designation and educational levels showed statistically significant differences in the ranking of the various dependent variables. In all instances, construction workers and those with lower educational levels had higher rankings for these variables. Construction companies need to implement training on-site to benefit their workers concerning ways that reduce environmental footprint, building staff confidence in people-centred values and relevant prevention strategies that foster positive physical and mental well-being in the workplace. Further to this, companies should ensure that workers participate and facilitate improvements related to their working conditions. Also, decent working conditions, particularly, provision of adequate occupational safety and health organisation on sites, should be cultivated and even incentivised on construction sites.

On the other hand, long-term interventions are required where the significant differences are industry entrenched and hence the magnitude of the resolutions are structural and require continuous improvement. The demographic variable of generation and designation showed a statistically significant difference with the decent work substantive element of adequate earnings and productive work. Respondents of different designations and generations within site/project managers, educators and regulators perceived that construction workers are not adequately remunerated for the work they undertake. The absence of even productivity measurement exacerbates the situation. Establishment of a

National Productivity Centre aids the generation of realistic standard outputs and provides a solid foundation for negotiations between workers and management. Aligned to this, continuous social dialogue within the Tripartite Negotiation Forum to establish fair remuneration is paramount.

The demographic variable of educational level and designation showed a statistically significant difference with the decent work substantive element of combining work, family and personal life. Respondents of different educational levels and designations within site/project managers, educators and regulators perceived that construction workers are disadvantaged through lack of work-life balance. This is possibly due to aspects of overtime being a financial motivation to workers, due to inadequate earnings. The scarcity of work also is a push factor for companies to informally make it compulsory for workers to work overtime. Resolutions would be sought beyond the site with structural adjustments required on the statutory instruments that inform conditions of work for construction workers. Work-life balance policies need to be enacted within the construction industry in line with advances in other countries and it should be an option for workers. Workers' trade unions need to undertake awareness campaigns on the advantages of work-life balance and how it is achievable, within their constituencies.

The demographic variable of designation showed a statistically significant difference with the decent work substantive element of stability and security of work. Respondents of different designations within site/project managers, educators and regulators perceived that construction workers are disadvantaged through lack of stability and security of work. The nature of the construction industry makes it difficult to ensure the stability and security of work. However, encouraging workers to multi-skill and offer outplacement services will aid the workers to achieve some form of stability.

The demographic variable of designation showed a statistically significant difference with the decent work substantive element of social security. Respondents of different designations within site/project managers, educators and regulators perceived that construction workers are disadvantaged through inadequate social security. Construction companies have to be encouraged to offer sustainability development strategies to construction workers that enable the social security of workers to be enhanced. Construction workers also need to be conscientised on the various strategies that they can lobby for within their trade unions or organisations.

The demographic variable of designation showed a statistically significant difference with the decent work substantive element of environmental context. Respondents of different

designations within site/project managers, educators and regulators perceived that construction workers are disadvantaged through inadequate environmental context aptitude. Training of skilled and semi-skilled workers needs to be adjusted through the incorporation of environmental context learning objectives. This supports the broader sustainability development drive in the construction industry by having an environmentally competent workforce. The culmination is a workforce that can conserve the environment within the workplace and transfer these skills to the communities' form which they originate.

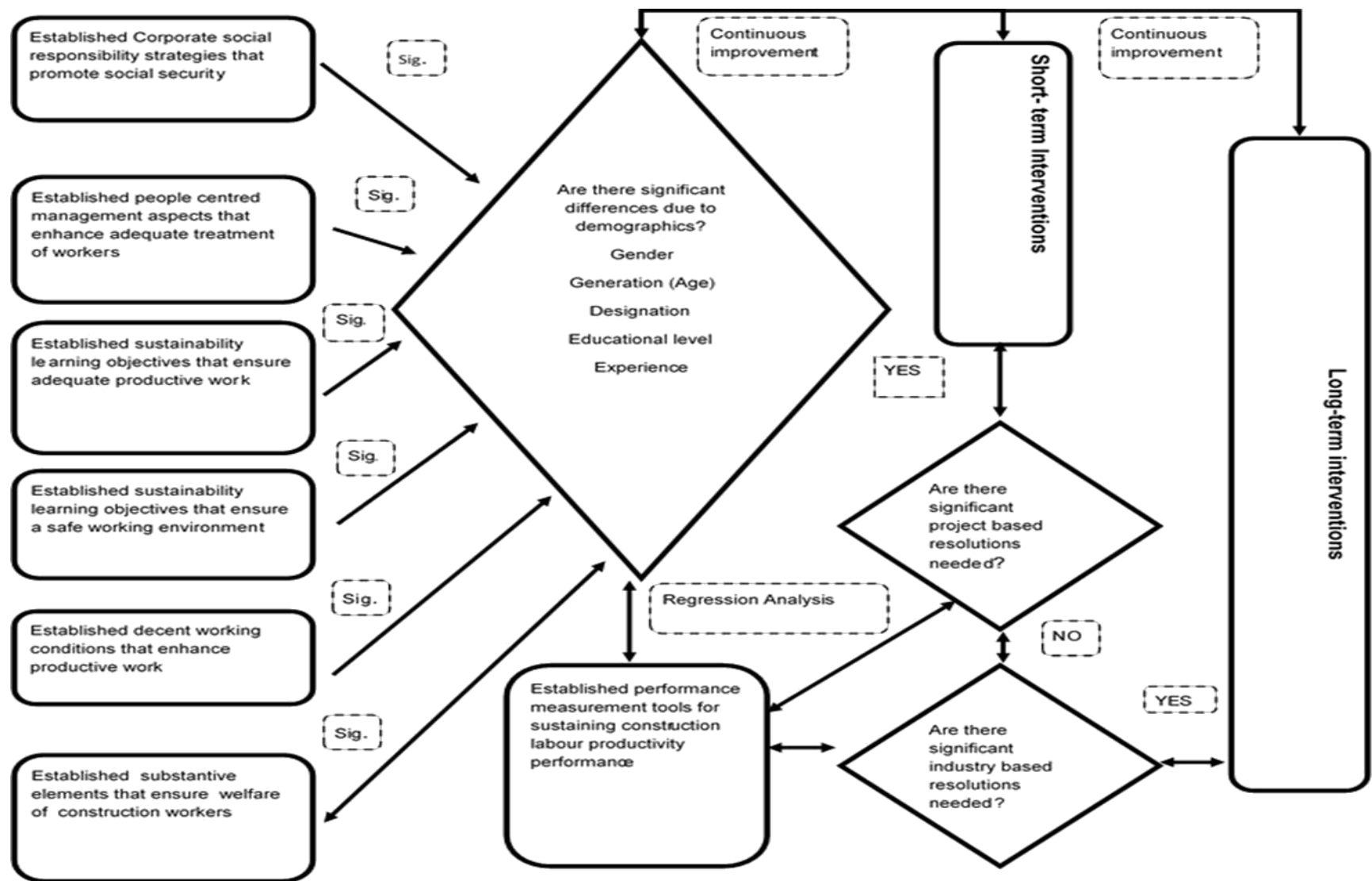


Figure 6.1: Model for sustaining construction productivity

6.5 VALIDATION

Developed models should be tested statistically, practically and logically, to determine whether they are efficient in predicting real-world results (Zayed, Elwakil & Ammar, 2012: 207). Practically, cross-validation of models was done through data splitting, to check if the developed models best fit the available data (Snee, 1977: 420). The validation data set (20% of collected data) was utilised for validation (Field, 2014: 313), however, five iterations were randomly undertaken from the data set and average results considered. Acceptability and validity of prediction models were dependent on practicality and comparison with theory (Snee, 1977: 419). Therefore, after cross-validation with actual data was undertaken and the theoretical standpoint was elucidated to make sense of the applicability of the model.

6.5.1 Validation of models

The validation data provided the actual data while the regression models were used for the predicted data. The developed models were validated using the Average Invalidity Percentage (AIP) and Average Validity Percentage (AVP) equations by comparing the predicted results with the actual values.

$$AIP = \sum_{i=1}^n [1 - (E_i / C_i)] \times 100/n \quad (1)$$

$$AVP = 100 - AIP \quad (2)$$

Source of (1) and (2) [Zayed *et al.* 2012: 208]

Where E_i = the i^{th} predicted value, C_i = is the i^{th} actual value and n is the number of observations.

Model 1

$$Y = 0.092 \cdot X1 - 0.158 \cdot X2 + 4.447$$

Where Y – Adequate earnings and productive work, $X1$ – Designation, $X2$ – Generation

The AVP values shown in Table 6.19, is 90.595%, showing a high prediction performance of the model. Site/project managers, educators and regulators are important in ascertaining the welfare and productivity of construction skilled and semi-skilled workers. Of similar importance is the generation (age) of these respondents. The different generational characteristics are important in revealing the shortcomings within this substantive element.

Table 6.19: Validation results for Model 1

Case No	Average actual data	Predicted values	AIP
1	5	4.6	0.082
2	4	4.2	0.062
3	5	4.4	0.119
4	4	4.4	0.102
5	4	4.4	0.102
6	5	4.7	0.063
7	4	4.3	0.079
8	5	4.2	0.169
9	5	4.5	0.100
10	5	4.7	0.063
			0.941
AIP (%) = \sum			9.405
AVP (%)			90.595

As confirmed by ILO (2013: 65), decent work requires that work to be productive and earnings are adequate. As workers contribute positively to the companies, they work for, they should be rewarded adequately and the earnings should be in tandem with the cost of living within their localities (Mhlanga, 2018: 12). The statistical indicator for this substantive element is “employees with recent job training” as shown in Table 6.2. Zimbabwean construction workers require continuous job training to align themselves with structural changes that have taken place the world over. Labour force surveys will ascertain the proportion of workers that have received recent skills development, however, the content of this training must be sensitive towards holistic sectorial changes. Evident changes are or will be brought about by sustainability needs together with the rapid technological changes the world over. This indicator will thus inform policy on enhancing productivity and competitiveness through facilitating suitable interventions (ILO, 2013: 89). To ensure satisfaction is achieved, annual data collection is imperative from construction workers. Its performance should be monitored continuously, with construction stakeholders of the set demographic variables, generation and designation. This model is applicable to predict the significance of the substantive element, both practically and logically.

Model 2

$$Y = -0.359 * X_1 + 1.248 * X_2 + 4.674$$

Where Y – Combining work, family and personal life, X_1 – Designation, X_2 – Education Level

For model 2, the AVP values shown in Table 6.20, is 93.95%, showing a high prediction performance of the model.

Table 6.20: Validation results for Model 2

Case No	Average actual data	Predicted value	AIP
1	6	6.5	0.075
2	7	6.8	0.028
3	7	6.5	0.071
4	6	5.6	0.067
5	6	6.3	0.044
6	7	6.8	0.028
7	6	6.5	0.075
8	6	6.5	0.075
9	6	5.6	0.067
10	6	6.5	0.075
			0.605
AIP (%) = \sum			6.05
AVP (%)			93.95

ILO (2013: 106) endorses that this substantive element relates to standards and fundamental principles and rights at work and social protection. Further to this, these consider a work-life balance of workers is upheld to encourage strongly founded families with consequent satisfied and productive employees. The statistical indicators, as shown in Table 6.2, of “unusual hours” and “maternity protection” are utilised within this element. Their contribution towards this substantive element is based on their aggregated contribution. The indicator on unusual hours refers to the period during which an employee is working anti-social hours and data is collected from construction workers through surveys or population census (ILO, 2013: 106). The desired outcome is to reduce the number of workers exposed to such conditions. Maternity protection provides women with time off work, before and after childbirth, to prevent harm during pregnancy with the aim being to successfully combine their reproductive and productive roles (ILO, 2013: 109). The nature of the construction industry’s employment contracts is a barrier in itself to achieving gender balance and this supports a perennial challenge of gender biases within the construction industry. The labour contracts within the Zimbabwean construction industry need to support

this decent work position. Data should be collected from female construction workers through surveys and censuses to have all women alluding to the existence of maternity protection within their workplaces. Performance through this indicator should be monitored periodically, most likely annually, through contributions from construction stakeholders alluding to the objectives being achieved. The most focus should be on the designation and educational level of the construction stakeholders within the performance appraisal. The model can be utilised to predict the performance of the substantive element.

Model 3

$$Y = -0.530 \cdot X_1 + 7.726$$

Where *Y* – *Stability and Security of work*, *X*₁ – *Designation*

For model 3, the AVP value shown in Table 6.21, is 85.35%, showing a very high prediction performance of the model. The model compares well with literature. The construction industry is synonymous with contract work and construction skilled and semi-skilled workers are most affected.

Table 6.21: Validation results for model 3

Case No	Average actual data	Predicted values	AIP
1	7	7.2	0.028
2	6	6.1	0.017
3	6	6.1	0.017
4	7	7.2	0.028
5	6	6.1	0.017
6	5	5.1	0.015
7	7	7.2	0.028
8	7	7.2	0.028
9	5	5.1	0.015
10	2	4.5	1.273
			1.466
AIP (%) = \sum			14.66
AVP (%)			85.34

Stability and security of work as a substantive element that allows for differentiation of relatively permanent jobs without subsistence working conditions from others (ILO, 2013: 127). The statistical indicators, as shown in Table 6.2, of “precarious employment rate” and “subsistence worker rate” are utilised within this element. Their contribution towards this

substantive element is based on their proportional contribution to the aggregated mean of 6.722. Designation of construction stakeholders was statistically significant within this element. Precarious employment rate provides information on the share of the employed whose contract of employment is of relatively short duration or whose contract can be terminated on short notice (ILO, 2013: 127). Data collected from construction workers through surveys should reflect a reducing precarious employment rate. Subsistence worker rate measures the share of employed persons who work in subsistence work, which constitutes the predominant consumption of the household (ILO, 2013: 134). Further to this, this Indicator is prevalent in developing countries where prolonged economic recessions are commonplace and as this rate increases, an indication of declining stability and security of work ensues. Data should be collected from construction workers through household and labour force surveys. Performance should also be monitored periodically through input from all construction stakeholders and specific attention is put on their designation.

Model 4

$$Y = -0.519 \cdot X_1 + 11.042$$

Where Y – Social Security, X_1 – Designation

For model 4, the AVP value shown in Table 6.22, is 93.33%, showing a very high prediction performance of the model.

Table 6.22: Validation results for model 4

Case No	Average actual data	Predicted values	AIP
1	9	8.4	0.056
2	9	9.5	0.054
3	10	9.5	0.052
4	9	8.9	0.004
5	9	8.9	0.004
6	12	7.9	0.339
7	11	10	0.091
8	9	8.9	0.004
9	9	9.5	0.054
10	8	7.9	0.009
			0.667
AIP (%) = \sum			6.67
AVP (%)			93.33

Poor workers are reported to be least protected through inadequate social security (Comaru Werna 2013: 12). Social security systems ensure decent healthy and living conditions during the working life and after retirement for construction workers through safeguarding and promoting human rights (ILO 2018: 46; ILO 2018c: 104). However, in Zimbabwe, the construction industry has a poorly subscribed pension scheme mostly owing to the nature of intermittent employment structures (Uzhenyu & Marisa, 2017: 91). The statistical indicators, as shown in Table 6.2, within this substantive element include share of population above pensionable age benefiting from pension; public social security expenditure (proportion of Gross Domestic Product); and share of economically active population contributing to a pension scheme.

Share of population above pensionable age benefiting from pension measures the proportion of the population above the statutory pensionable age or aged 65 and above that receives an old-age pension (ILO 2013: 169). Data is collected from administrative records and surveys of former construction workers above the statutory retirement age. ILO (2011: online) states that a rise in the indicator indicates an increase in pension coverage. However, ILO (2018: 49) argues that there is further need to analyse the cash value of the benefit and interpreting on whether it is sufficient to meet the basic cost of living standards gazetted by the relevant consumer organisations.

Public social security expenditure (proportion of Gross Domestic Product) presents the total public social security expenditure expressed as a percentage of the GDP (For construction activities) (ILO 2013: 169). In Zimbabwe, data should be collected from national accounts and social security schemes such as NSSA. ILO (2011: online) relays that failure to indicate the population coverage and average expenditure for those covered is a major limitation of this indicator. However, the higher the proportion, the more the decent work objective is being achieved. The construction stakeholders should be able to appraise the performance of this indicator through verification that the purported expenditure is benefiting the intended workers.

Share of the economically active population contributing to a pension scheme aims to capture the share of the economically active population protected through a contributory pension scheme (ILO 2013: 169). The integrity of the scheme should be analysed and aspects of contributory, universality and means-tested schemes should be considered to allow effective coverage to be ascertained (ILO 2018: 49). In Zimbabwe, construction

workers voluntarily subscribe to pension schemes, however, low earnings and low security of work are potential factors that might limit its uptake.

Model 5

$$Y = 0.153 * X_1 + 3.874$$

Where *Y* – Environment Context, *X*₁ – Designation

For model 5, the AVP value shown in Table 6.23, is 96.04%, showing a high prediction performance of the model. This model can be used to predict the performance of Environmental context through the demographic variable of designation (site/ project managers, educators and regulators).

Table 6.23: Validation results for model 5

Case No	Average actual data	Predicted values	AIP
1	4	4.00	0.007
2	5	4.60	0.073
3	4	4.30	0.083
4	4	4.20	0.045
5	4	4.00	0.007
6	5	4.80	0.042
7	4	4.20	0.045
8	4	4.20	0.045
9	4	4.00	0.007
10	5	4.80	0.042
			0.396
AIP (%) = \sum			3.96
AVP (%)			96.04

Continuous and sustainable improvements can only be guaranteed if workers' activities are adequately embraced within environmental sustainability goals (Theyel, 2000: 264). This endeavour cascades into the workers' duties and thus entails workers' environmental management competence to be measured. The environmental impact of labour administration indicator, as shown in Table 6.2, is utilised within this substantive element. Lack of employment, awareness, training opportunities and income insecurity contribute to environmental degradation (ILO 2018c: 28). Therefore, this indicator is vital as it seeks to provide a direct correlation between environmental sustainability aspects and administration of labour. Data should be collected from the construction workers through surveys and

population census. The higher the rate of the indicator, the better the public administration in the field of national labour policy with due consideration to its impact on the environment (ILO 2013: 242). Performance should also be appraised through contributions from construction stakeholders, with their designation being significant to ascertaining any achievements made. The model can be utilised to predict the performance of the substantive element.

6.6 CHAPTER SUMMARY

This chapter considered the testing of hypothesis 6 that stated that comprehensive sustainability indicators for construction labour productivity performance could be developed through consultations with construction stakeholders, where 26 indicators with good reliability of 0.831 were analysed. Individual indicators were aggregated to form substantive elements as defined by the Decent Work Agenda. Pearson bivariate correlation method was used to find statistically significant relationships between substantive elements and demographic variable of gender, generation (age), designation, educational levels and experience of respondents. Significance and correlation were determined between adequate earnings and productive work and age (-) and designation (+); Combining work, family and personal life and designation (-) and education level (+); Stability and security of work and designation (-); social security and designation (-); and environmental context and designation (+). These results thus, accept the null hypothesis that “Comprehensive sustainability indicators for construction labour productivity performance can be developed through consultations with construction stakeholders”.

Regression analysis was then undertaken to model the statistically significant relationships between substantive elements and demographic variable of gender, generation (age), designation, educational levels and experience of respondents. A model was formulated for sustaining construction labour productivity that included statistically significant regression models and derived statistically significant demographics from construction labour productivity determinants under study. Validation of the regression models was undertaken through cross-validation and secondary data analysis.

CHAPTER 7 CONCLUSIONS AND RECOMMENDATIONS

7.1 INTRODUCTION

This chapter presents the conclusions from the objectives, general conclusions, conclusions from the framework, contribution to knowledge, recommendations, recommendations for further studies and the limitations of the study.

7.2 CONCLUSIONS FROM OBJECTIVES

The study consisted of objectives that considered integrating sustainability dimensions into construction labour productivity determinants. Each objective was borne out of a research question that exposed the gap in knowledge and hypotheses tests were undertaken to ascertain the contribution of knowledge since the study was quantitative,

Corporate social responsibility strategies that ensure social security of construction workers

The variables under study were interrogated through two objectives and the conclusions were derived. **Objective 1.1** sought to determine significant corporate social responsibility strategies that contribute the most to improved construction skilled and semi-skilled workers' social security in Zimbabwe. The Cronbach alpha reliability test showed good reliability of 0.807 for the 13 strategies under study. A normality test was undertaken and justified use of non-parametric tests, Pearson Chi-squared test, for testing goodness of fit of strategies. The test ascertained all the corporate social responsibility strategies under study as being significant. Hence, construction companies in Zimbabwe must implement corporate social responsibility strategies through equipping workers with knowledge and skills that can be transferred to and benefit themselves and their communities. A highest Cramer's value of 0.804 determined provision training of staff on ways to reduce environmental footprint and transference to communities as the most significant strategy towards improving construction skilled workers' social security in Zimbabwe.

Objective 1.2 sought to establish the difference of perceptions, due to demographic variables, of construction site managers'/ project managers and construction skilled trade workers on corporate social responsibility strategies that lead the most to improved

construction skilled and semi-skilled workers' social security. The normality test also justified the use of non-parametric tests, Mann-Whitney U test and Kruskal-Wallis test, for testing significant differences between demographic groups. The results showed that there was no statistically significant difference in the collective corporate social responsibility strategies concerning age, gender, designation and experience of respondents. However, corporate social responsibility strategies showed a statistically significant difference due to the educational levels of respondents. However, individual corporate social responsibility strategies showed statistically significant differences due to age, designation and educational levels and these require specified attention.

People-centred management aspects that influence adequate employment treatment of construction workers

The variables under study were interrogated through two objectives and the conclusions derived. **Objective 2.1** sought to determine significant people-centred labour aspects that influence adequate employment treatment for Zimbabwean construction skilled and semi-skilled workers the most. The Cronbach alpha reliability test showed acceptable reliability of 0.747 for the 15 aspects under study. A normality test was undertaken and justified use of non-parametric tests, the Pearson Chi-squared, for testing goodness of fit of aspects. The chi-squared test ascertained all the people-centred labour productivity management aspects under study as being significant. Construction companies in Zimbabwe need to consider implementing a people-centred labour productivity management aspect within their construction sites as they promote the welfare of workers and are a more humane approach. A highest Cramer's value of 0.907 confirmed building staff confidence in people-centred values as the most significant aspect towards influencing adequate employment treatment for Zimbabwean construction skilled and semi-skilled workers.

Objective 2.2 sought to establish the difference of perceptions, due to demographic variables, of construction site managers'/ project managers and construction skilled trade workers on people-centred management aspects that influence adequate employment treatment for construction skilled and semi-skilled workers the most. The normality test also justified the use of non-parametric tests, Mann-Whitney U test and Kruskal-Wallis test, for testing significant differences between demographic groups. The results showed that there was no statistically significant difference in the collective people-centred management

practices concerning age, gender, designation, educational level and experience of respondents. However, individual people-centred management aspects showed statistically significant differences due to age, designation, educational levels and experience of respondents and these require specified attention.

Sustainability literacy objectives that contribute the most to adequate productive work for construction skilled workers

The variables under study were interrogated through two objectives and the conclusions derived. **Objective 3.1** sought to determine significant sustainability literacy objectives that contribute the most to adequate productive work for technical and vocational trained Zimbabwean construction skilled workers. The Cronbach alpha reliability test showed excellent reliability of 0.910 for the 15 learning objectives under study. A normality test was undertaken and justified use of non-parametric tests, the Pearson Chi-squared, for testing goodness of fit of objectives. The chi-squared test ascertained all the sustainability literacy objectives under study as being significant. Technical and vocational training institutions in Zimbabwe should inculcate sustainability learning objectives within their curricula if any meaning strides in ensuring adequate productive work of skilled workers is to be achieved. A highest Cramer's Value of 0.873 determined the learning objective of training workers to facilitate improvements related to working conditions as most significant towards contributing the most to adequate productive work for technical and vocational trained Zimbabwean construction skilled workers.

Objective 3.2 sought to establish the difference of perceptions, due to demographic variables, of construction site managers/ project managers, vocational lecturers and construction skilled trade workers on sustainability literacy objectives that contribute the most to adequate productive work for construction skilled workers. The normality test also justified the use of non-parametric tests, Mann-Whitney U test and Kruskal-Wallis test, for testing significant differences between demographic groups. The results showed that there was no statistically significant difference in the collective sustainability learning objectives through training curricula of skilled workers concerning age, gender, designation, educational levels and experience of respondents. However, individual people-centred management aspects showed statistically significant differences due to the designation and educational levels of respondents and these require specified attention.

Sustainability literacy objectives that contribute the most to a safe working environment for construction semi-skilled workers

The variables under study were interrogated through two objectives and the conclusions derived. **Objective 4.1** sought to determine significant sustainability literacy objectives that contribute the most to a safe working environment for on-the-job trained Zimbabwean construction semi-skilled workers. The Cronbach alpha reliability test showed excellent reliability of 0.930 for the 12 learning objectives under study. A normality test was undertaken and justified use of non-parametric tests, the Pearson Chi-squared, for testing goodness of fit of objectives. The chi-squared test ascertained all the sustainability literacy objectives under study as being significant. Construction companies in Zimbabwe should establish structured on-the-job training that incorporates sustainability learning objectives to achieve the welfare of workers and specifically their safety on sites. A highest Cramer's value of 0.928 determined the learning objective of training on relevant prevention strategies to foster positive physical and mental health well-being in the workplace as most significant towards a safe working environment for on-the-job trained Zimbabwean construction semi-skilled workers.

Objective 4.2 sought to establish the difference of perceptions, due to demographic variables, of construction site managers'/ project managers, training managers, construction skilled trade workers and training managers on sustainability literacy objective that contributes the most to a safe working environment for construction semi-skilled workers. The normality test also justified the use of non-parametric tests, Mann-Whitney U test and Kruskal-Wallis test, for testing significant differences between demographic groups. The results showed that there was no statistically significant difference in the collective sustainability learning objectives through on-the-job training of semi-skilled workers concerning age, gender, educational levels and experience of respondents. However, collective sustainability learning objectives also showed a statistically significant difference due to designation of respondents' sustainability literacy objectives showed statistically significant differences due to gender, designation and educational levels of respondents and these require specified attention.

Decent working conditions for improved construction labour productivity

The variables under study were interrogated through two objectives and the conclusions derived. **Objective 5.1** sought to determine significant decent working conditions that influence improved productive work for Zimbabwean construction skilled and semi-skilled workers the most. The Cronbach alpha reliability test showed good reliability of 0.827 for the 7 decent working conditions under study. A normality test was undertaken and justified the use of non-parametric tests, the Pearson Chi-squared, for testing goodness of fit of decent working conditions. The chi-squared test ascertained all the decent working conditions under study as being significant. Construction companies in Zimbabwe should ensure decent working conditions on construction sites to achieve improved construction labour productivity and welfare of workers. A highest Cramer's value of 0.800 determined provisions of adequate occupational safety and health organisation on sites as most significant towards improving construction labour productivity.

Objective 5.2 sought to establish the difference of perceptions, due to demographic variables, of construction site managers'/ project managers' construction skilled and semi-skilled workers on decent working conditions that lead the most to improved productive work for construction skilled workers. The normality test also justified the use of non-parametric tests, Mann-Whitney U test and Kruskal-Wallis test, for testing significant differences between demographic groups. The results showed that there was no statistically significant difference in the collective decent working conditions concerning age, gender and experience of respondents. However, designation and educational levels of respondents showed statistically significant differences.

Indicators for sustaining construction labour productivity performance

The variables under study were interrogated through one objective and the conclusions derived. **Objective 6** sought to develop a model on sustaining construction labour productivity performance the Zimbabwean construction industry aligns to. The Cronbach alpha reliability test showed good reliability of 0.831 for the 26 learning objectives under study. A mean rating was undertaken and the indicators were aggregated to constitute substantive elements founded in the Decent Work Agenda. A normality test was undertaken and justified use of parametric tests, Pearson bivariate correlation method, for testing relationships between the significant substantive element and demographic variables. Significance and correlation were determined between adequate earnings and productive

work and age (-) and designation (+); Combining work, family and personal life and designation (-) and education level (+); Stability and security of work and designation (-); social security and designation (-); and environmental context and designation (+). Consequent to this, statistically significant regression models were developed for performance measurement for sustaining construction labour productivity.

7.3 GENERAL CONCLUSIONS

This research considered the compounded challenges of lack of enabling policy frameworks and active labour market policies that measure performance concerning decent work deficits that include vulnerable employment and low productivity (ZUNDAF, 2010:19). These challenges were addressed through integrating sustainability dimensions, situated in the decent work agenda, into construction labour productivity determinants in the Zimbabwe construction industry. Although the study was quantitative, a few open-ended and close-ended questions sought to establish the background of the issues. The quantitative enquiry, on the other hand, sought their perceptions on alternative approaches towards addressing the existing challenges. The key construction industry participants acknowledge the significance of various interventions within the construction labour productivity determinants towards augmenting welfare of workers and enhancing their productivity. Both managers and construction workers allude to decent work-related interventions.

Site/project managers have a more comprehensive understanding of corporate social responsibility that is skewed towards sustainability development aspects, compared to construction workers. The benefits of enhancing social security of workers are much aligned to the welfare of workers. The reactive nature of the strategies currently being implemented does not aid the thrust of enhancing sustainability. There is a need to be more proactive as these accumulate the most benefit to both the companies and workers. Furthermore, engaging in policies that promote human resources within communities is most advantageous in enhancing the social security of workers. The implication is the need to encourage a deliberate policy shift towards the implementation of corporate social responsibility strategies by construction companies. Prioritising strategies that benefit the workers is important because the majority of workers tend to live below the poverty line. The continued worrisome state of the Zimbabwean construction sector requires inclusive and well-resourced corporate social responsibility programmes and functional job centres. Construction companies can augment existing on-the-job training schemes through training

workers in economic, environmental and social aspects that can benefit the workers beyond their employment. Environmental aspects have lagged and need drastic interventions like awareness campaigns through the relevant regulatory organisation. Well-trained construction workers best serve their communities through improving their livelihoods, and they benefit construction companies through improved safety and health consciousness and quality workmanship, which will in turn increase profitability and enhance the reputation of the organisation.

The existing dominance of production-centred management approach on construction sites has contributed to the current low productivity levels. Thus, a manpower management approach that enhances productivity and supports human resource welfare is envisaged within the Zimbabwean construction industry. Construction workers in Zimbabwe perceived people-centred management to be fundamental towards resolving these challenges. Thus, construction companies are encouraged to implement people-centred management aspects within their sites to enhance the productivity and welfare of workers. Also, a holistic adjustment in the type of management is proffered if continuous productivity gains are to be achieved and maintained. Cumulatively, a confident, safe, motivated, involved, committed workforce inclines to produce at a higher level. Fundamental instruction in people-centred management aspects that promote adequate employment treatment and productivity enhancement before their entering and within the world of work is encouraged. Thus, behavioural conditioning for the propagation of people-centred values, especially for semi-skilled workers, is supported as potentially improving treatment of workers and labour productivity.

Sustainability literacy within the construction industry is not consistent across the different designations. Site/project managers have a considerable and balanced appreciation of sustainability literacy that acknowledges both training and sustainable development aspects. The construction workers have average to low understanding of sustainability learning objectives. Construction semi-skilled workers had the least understanding and this is detrimental towards achieving construction workers' welfare on construction sites. Therefore, the incorporation of sustainability learning objectives within their training is pertinent. Training for managers, on sustainability learning objectives understudy, is also essential to enable them to pacify the plight of skilled and semi-skilled workers. Standardised on-the-job training schemes are required that are centred on environmental and economic sustainability.

There is a consensus that adequate decent working conditions are important to ensuring productivity improvement. Site/project managers were conversant of the importance of both the welfare of workers and productivity improvement, within their insights. These conditions must be replicated on all construction sites. Further to that, they must ensure the welfare of workers first, before productivity gains can be realised. Workers are inclined to improve their productivity if the environment in which they are working is safe and protects them against any aspects that can affect their health. Instruction on the construction workers' rights to decent working conditions is paramount, especially on the entitlement to adequate working conditions. On-the-job training that allows these rights to be developed is also pertinent. Firmer collective bargaining by workers and an increased impact of trade unionism within the Zimbabwean construction industry is envisaged. Therefore, the provision of decent working conditions was perceived as being essential for productivity improvement on construction sites. This provides construction practitioners with a clear perspective on consequential actions within their contractual, financial, value and risk management roles in pre-construction, construction and post-construction stages. Sufficient budgets that ensure that such conditions are provided for and the competence to allow for them adequately must be prerequisites for the commencement of construction projects. Furthermore, adjudication of tenders should entail more in-depth inspection and evaluation on sufficient value, financial and risk management considerations of these fundamental conditions. Appropriate planning, monitoring and control will inevitably lead to improving productive work on construction sites, enhancing national productivity and achieving economy within the Zimbabwean construction industry.

Conclusively, various construction personnel potentially benefit from this research. Construction, site and project managers benefit through empirical evidence of site conditions that would ensure enhanced productivity on construction sites. Construction workers' welfare is improved through site conditions that safeguard their health and well-being. Though the construction industry stakeholders had a commendable understanding of productivity performance measurement, as they contributed significant needs for sustaining construction labour productivity. However, site/project managers, educators and regulators are not very much conversant of the importance of the welfare of workers within their insights. Thus, determination of relationships between performance indicators and demographics variables was feasible and anticipated regression models developed for sustaining of construction labour productivity.

7.4 CONCLUSIONS ON THE FRAMEWORK

The interconnectedness of the theoretical and conceptual framework, as set in Figure 2.2 and Figure 2.3 respectively, and conceptual conclusions are discussed hereafter. The framework from empirical evidence, as shown in Figure 7.1, shows how the theories, which were initiated in the theoretical framework, of sustainability, decent work and labour productivity have been encapsulated. The conceptual framework that was set to contribute to the gap in knowledge was also achieved through the framework in Figure 7.1, based on empirical findings.

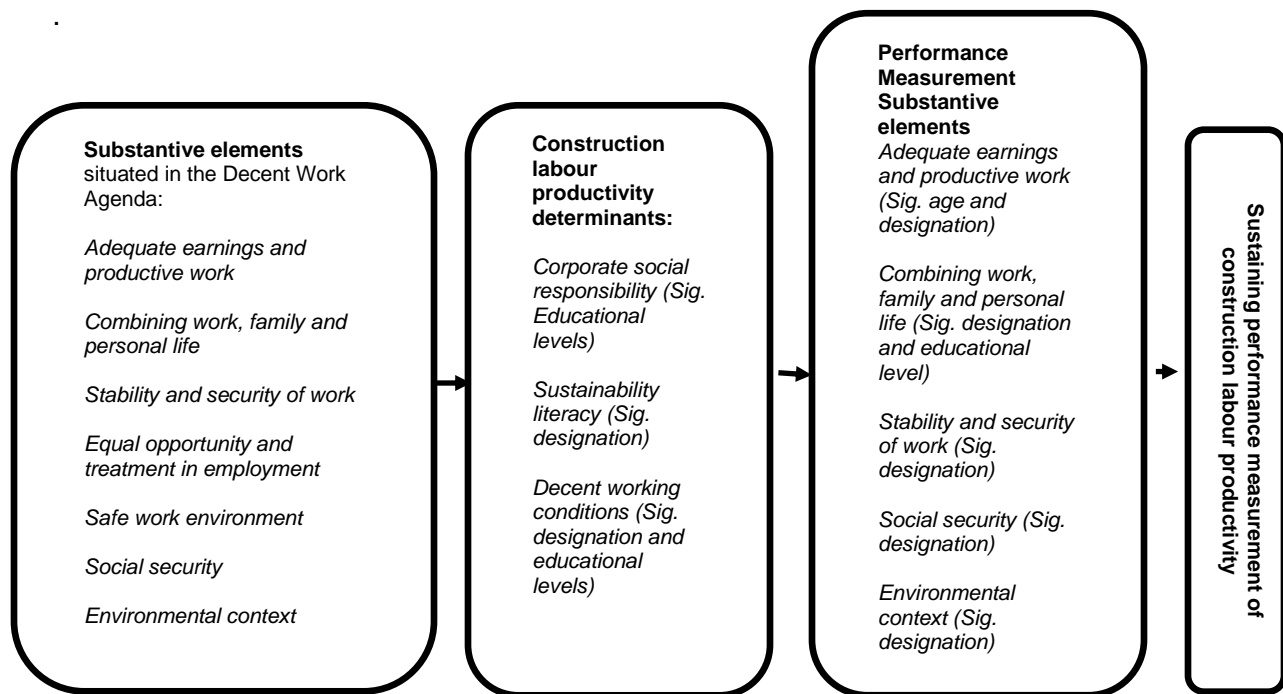


Figure 7.1: Framework for sustaining construction labour productivity

Sustaining construction labour productivity is shown to be based on addressing shortcomings situated in the decent work substantive elements and construction labour productivity determinants concerning the demographics of construction industry participants. Effective resolutions of deficiencies in construction labour productivity determinants require attention on the related decent work substantive elements and targeted attention where statistically significant demographic variables were determined. These include encouraging the implementation of corporate social responsibility strategies that enhance the social security of workers through addressing concerns from those with different educational levels. Also included is equipping the different designations with

adequate sustainability literacy and ascertaining acceptable decent working conditions for different designations and educational levels. Short and long-term interventions, as elucidated in section 6.4.1, are necessary and achievable through continuous performance measurement of sustaining of construction labour productivity. This entails continuous feedback from the construction industry participants on relevant substantive elements and the significant demographic variables

7.5 CONTRIBUTION TO KNOWLEDGE

The knowledge gap was the lack of evidence to utilise substantive decent work substantive elements to improve and sustain construction labour productivity through demographic variables of stakeholders. This was interrogated through, but not limited to, gaps in the lack of evidence of corporate social responsibility strategies, people-centred management aspects, sustainability learning objectives and decent working conditions that significantly enhance the welfare of construction workers and productivity. Further to that, lack of evidence on statistically significant differences of demographics of respondents on ranking on corporate social responsibility strategies, people-centred management aspects, sustainability learning objectives, decent working conditions and performance indicators to achieve construction workers' welfare and productivity improvement.

Whilst theories on sustainability, decent work and construction productivity determinants exist to remedy the challenges within the Zimbabwean construction industry, country-specific interventions were non-existent. Further to that, demographic related challenges were not exposed and thus targeted short and long-term interventions could not be generated. However, this study revealed the country-specific solutions and associated demographic particularities (gender, age, designation, education level and experience) of construction workers.

Though corporate social responsibility strategies are viewed as costly initiatives, they have the potential of achieving short and long-term net benefits for the companies and the workers. Encouraging Zimbabwean construction companies to implement corporate social responsibility strategies is fundamental for social security of workers and potential uplifting of communities in which the companies operate. It is apparent that construction workers have a low understanding of such corporate social responsibility strategies and thus can not advocate for them. While site and project managers are more inclined to implementing strategies that initially benefit the companies, construction workers need strategies that promote their social lives, beyond employment. Training workers on ways that reduce

environmental footprint is the most significant strategy towards ensuring social security of workers. Workers benefit from such training as their well-being is enhanced and their communities' benefit through the transference of such knowledge. There were disparities on the aptitude of corporate social responsibility strategies, which has led to construction workers with low educational levels, being disadvantaged. Thus, targeted training for those within this demographic is envisaged.

Whilst the Zimbabwean construction industry predominantly implements production-centred management, this approach has been deemed unsuitable towards enhancing the welfare of construction workers and consequent improvement of construction labour productivity. People-centred management aspects were attributed as essential to achieving the study's objective, however, construction workers are keener on aspects that build confidence in people-centred values and encourage inter-personal relationships whilst the managers prefer those that directly lead to improving labour productivity. Targeted interventions for designations and educational levels, for some of the aspects, are encouraged.

The non-existence or inadequacy of sustainability learning objectives in training of both construction skilled and semi-skilled workers is evident. Those that are more knowledgeable on these objectives are the white-collar workers, however, they fail to create satisfactory conditions for the blue-collar workers. This has exposed workers within the industry to physical, health and mental harm. However, the study confirms that well-trained workers considerably have few accidents and incidences, are less exposed to unhealthy situations and produce more in the workplace. Fundamental sustainability learning objectives have thus been extended for incorporation in the training of skilled and semi-skilled workers. Skilled workers are most in need of sustainability learning objectives that allow them to facilitate improvements related to working conditions in their endeavour to ensure adequate productive work. On the other hand, semi-skilled workers are most in need of prevention strategies that foster positive physical and mental health well-being in the workplace for them to ensure a safe working environment.

Whilst working conditions for construction workers are promulgated within the Zimbabwean construction industry, they have been inadequate in capturing the decent work agenda requirements, with the workers being the most affected. Pertinent decent working conditions that can immensely contribute to the welfare of workers and productivity improvement have been determined in this study. Provision of adequately occupational safety and health is key towards enhancing construction labour productivity. Further to that, statistically

significant differences due to educational levels assist in formulating training in decent work and awareness campaigns that enable workers to demand satisfactory conditions on sites.

Numerous statistical indicators and substantive elements that measure the performance of decent work have been confirmed in the literature. However, the Zimbabwean construction industry can utilise those that are significant to measure performance for sustaining construction productivity. This study unearthed statistically significant regression models that show the correlation of substantive elements to demographic variables. The substantive element of adequate earnings and productive work was inversely related to age whilst positively related to designation. This means the lower age groups and the higher designations were least satisfied with the earnings and adequate work. The substantive element of combining work, family and personal life was inversely related to the designation and positively related to education levels. This means that as the designations changed from Site managers to NAMACO committee members, the less concerned with the substantive element. The higher educational levels were most concerned about the lack of combining work, family and personal life. The substantive element of stability and security of work was inversely related to designation, translating to the lower designations being least concerned with the stability and security of work. The substantive element of social security was inversely related to the designation of workers, meaning that the lower designations thought the least that workers were socially vulnerable. The substantive element of environmental context was positively related to designation, meaning that as designations moved from site managers to NAMACO members, the concern on environmental issues for workers increased. These enable derivation of short and long-term interventions for project-based anomalies and continuous improvement. It is clear from the study that, construction labour productivity performance that does not consider decent working and demographic variables is inept. This study succeeds in integrating sustainability dimensions into construction labour productivity determinants.

7.6 RECOMMENDATIONS FROM THE STUDY

The focus of this study was to integrate sustainability dimensions into construction labour productivity determinants. To achieve this, substantive elements in the Decent Work Agenda were interrogated concerning specific determinants of productivity. From the results of the study, the following recommendations were noted.

Recommendations to construction companies

- Construction companies are recommended to satisfy the requirements of the Decent Work Agenda substantive elements, within their construction sites, as this ensures the welfare of construction workers and consequent improvement of productivity.
- Construction companies should institute labour productivity measurement that is cognisant of the provision of decent work conditions.
- Construction companies should equip semi-skilled workers with sustainability learning objectives through awareness campaigns and even off-site training short-term courses. Whilst semi-skilled workers were directly targeted, awareness training campaigns for site management is also invaluable for adequate welfare of all workers. Thus, there is also a need for construction professionals to be sufficiently trained in sustainability learning objectives to effectively implement them within their sites.

Recommendations to Trade Unions

- Relevant consultation with workers and persistent lobbying for recourse is encouraged on issues that affect their welfare.
- Facilitation of awareness campaigns on workers' rights within the "World of Work" is advocated for.

Recommendations to the Zimbabwean Government

- The implications of this study include encouraging or incentivising a deliberate governmental or organisational policy shift towards the implementation of corporate social responsibility strategies by construction companies. Regulation in this aspect is not encouraged. Inclusive and well-resourced programmes are encouraged. All these interventions must be targeted as different demographic variables require different interventions. This approach would ensure a holistic approach towards enhancing the welfare of workers and improving productivity on construction sites.

Recommendations to the construction industry

- Interventions are required to address existing contractual documentation improvements. The consultant quantity surveyor is also encouraged to depart from the 'standard' form of contract and capture these decent working conditions with the detail they require. Furthermore, adjudication of tenders should entail more in-depth inspection and evaluation on sufficient value, financial and risk management

considerations of these fundamental conditions. Appropriate planning, monitoring and control will inevitably lead to improving productive work on construction sites, enhancing national productivity and achieving economy within the Zimbabwean construction industry.

- Robust productivity performance measurement within the industry needs to be implemented and its reporting should be accompanied with reporting on achievement of decent work substantive elements.
- The Construction workers pension fund and NSSA need to be augmented by construction companies and or other relevant players in the construction industry, so to ensure that construction workers are adequately kept after injury, disability and beyond their retirement.
- Establishment of sustainability enriched on-the-job training schemes that are sufficiently planned, monitored and controlled by the National Employment Council of the construction industry is essential.

Recommendations to Technical and Vocational training institutions

- Training of construction skilled workers requires timeous structural adjustments to curricula as and when they are due. Continuous curricula review that is sensitive to ever-changing global sustainability needs is pertinent.
- Capacitation of training institutions with adequately trained lecturers and instructors through short term courses is paramount

7.7 AREAS FOR FURTHER STUDY

Further studies should focus on aspects that were beyond the scope of this study and these include:

- To determine the significance of other construction labour productivity determinants to substantive elements within the decent work agenda
- To investigate how training and re-training can be structured and enhanced so that it is timeously responsive to fundamental changes in the world of work
- To assess the contribution of construction clients to enhancing the welfare of construction workers
- To investigate how contract documentation can be enhanced to inculcate decent work aspects

- To investigate significant statistical differences due to other variables like construction company category, construction consultants and types of clients on enhancing decent work on construction projects.

7.8 LIMITATIONS OF THE STUDY

Construction labour productivity determinants were selected from empirical evidence within the Zimbabwean construction industry. Whilst these determinants may not be universal, they were deemed significant within the area of study.

The lack of a functional database for construction skilled and semi-skilled workers affected the generation of an accurate population for this respondent group. However, a considerable number of construction sites were selected within two of the most active cities in the country and all construction skilled and semi-skilled workers were targeted for participation.

Whilst various other participants' views are pertinent towards model development for performance measurement for sustaining construction labour productivity, only site and project managers, educators and regulators were considered sufficient for model development. This decision was necessitated by their education level and experiences, potentially being able to appreciate the contextual meaning of the indicators under study.

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APPENDIX A: QUESTIONNAIRE FOR SITE/ PROJECT MANAGERS

Nelson Mandela University

Department of Quantity Surveying

Questionnaire Site Managers/ Project managers

Date: 3 September 2018

Dear Sir / Madam,

RE: Participation in survey

I am a PhD candidate in the Department of Quantity Surveying, Nelson Mandela University, Port Elizabeth, South Africa. I am conducting a research project entitled: "Integrating sustainability dimensions into construction labour productivity determinants in Zimbabwe" (Ethics clearance number: H16-ENG-BQS-001)

This study seeks to explore the sustainable development dimensions which can be integrated into the construction labour productivity determinants for ensuring successful delivery of projects in Zimbabwe.

I kindly request your participation in the study by completing the attached questionnaire that should not take more than 45 minutes of your time to complete. Respondents were selected through random sampling of construction companies that are registered with the Construction Industry Federation of Zimbabwe resident in Harare and Bulawayo.

The information gathered will be confidential and research data will be anonymous. Thus, you are not requested to provide personal information and any other information not relevant to the study. Furthermore, you are assured that your participation is purely voluntary and that you can withdraw from participation in the study at any point without fear of reprisal.

The completed questionnaire will be collected from your offices; or you can email it to the following email address: tirivavimoyo@gmail.com

Yours sincerely,

Tirivavi Moyo (*PhD Candidate*)

Cell number: 0773054568

A. Profile of the Respondents

1. Please indicate your gender

Male		Female	
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2. Please indicate the generation you were born in

Baby Boomer (1946 - 1960)		Generation X (1961 - 1979)	
Generation Y (1980 - 1994)		Generation Z (1995 - present)	

3. Please indicate your designation

Site manager		Project manager	
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4. Please indicate your level of education

Certificate		Diploma		Degree	
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5. Please indicate your qualification_____

6. Please indicate your years of experience in the construction industry

1-5 Years		6-10 Years	
10-15 Years		15+ Years	

7. Please indicate your company's Contractor CIFOZ category

Category A		Category B	
Category C		Category D	
Category E		Category F	
Category H			

8. Please indicate how many years your construction company has been operational

1-5 Years		6-10 Years	
10-15 Years		15+ Years	

B. Corporate social responsibility strategies

1. What do you understand by corporate social responsibility in construction?

2. Does your organisation implement social responsibility strategies?

Yes		No	
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3. If **Yes**, how have they benefited your organisation?

4. If **No** to Question 2, what are the reasons?

5. What do you consider the nature of your strategies to be?

Philanthropic (<i>humane and selfless</i>)		Sustainability development (<i>community-empowering activities</i>)	
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6. Kindly rate the **extent** to which the following type of **strategies are implemented** in your organisation using the below-mentioned scale:

- 1 = Not at all
- 2 = To a little extent
- 3 = To some extent
- 4 = To a great extent
- 5 = To a very great extent
- U = Unsure

Item	Type of strategy	1	2	3	4	5	U
1	Strategies that are formulated to respond to stakeholders' demands	1	2	3	4	5	U
2	Strategies that are suppressed or changed due to demands from the firm's current situation	1	2	3	4	5	U
3	Strategies that lead to pre-emptive allocation of related resources to adapt to the possible change in demands of the stakeholder	1	2	3	4	5	U
4	Strategies used by firms to influence the shape of stakeholders' demands to benefit the organisation	1	2	3	4	5	U

7. Rate the **importance** of implementation of these **labour-related strategies** against the given aspects, using the below-mentioned scale:

- 1 = Not important
- 2 = Of little importance
- 3 = Somewhat important
- 4 = Important
- 5 = Very important
- U = Unsure

Item	Aspects	1	2	3	4	5	U
1	Reduced operating costs	1	2	3	4	5	U
2	Enhanced brand image and reputation	1	2	3	4	5	U
3	Increased sales and customer loyalty	1	2	3	4	5	U
4	Increased customer satisfaction	1	2	3	4	5	U
5	Improved productivity and quality	1	2	3	4	5	U
6	Enhanced stakeholder relations and credibility	1	2	3	4	5	U
7	Increased integration and alignment	1	2	3	4	5	U
8	Strengthened internal communication	1	2	3	4	5	U
9	Improved welfare and the wellbeing of workers	1	2	3	4	5	U

8. Kindly rate the **significance** of the labour-related strategies to ensure the **social security of workers**, using the below-mentioned scale:

- 1 = Not significant
- 2 = Of little significance
- 3 = Somewhat significant
- 4 = Significant
- 5 = Very significant
- U = Unsure

Item	Strategy	1	2	3	4	5	U
1	Establish an environmental management system that transfers good practices to the communities	1	2	3	4	5	U
2	Train staff on ways to reduce the environmental footprint of construction activities	1	2	3	4	5	U
3	Train staff on the effects and the need for minimisation of consumption of natural resources within their communities	1	2	3	4	5	U
4	Train staff on strategies to reduce the emission of hazardous substances	1	2	3	4	5	U
5	Involve employees in business decisions that affect them and improve the work environment	1	2	3	4	5	U
6	Offer outplacement services, retraining and severance benefits, when closures and retrenchments are imminent	1	2	3	4	5	U
7	Extend training to life management, retirement planning and care of dependants	1	2	3	4	5	U
8	Be open to flexi-time and other work-life balance policies for construction workers	1	2	3	4	5	U

9	Establish policies to ensure the well-being of all employees and the public	1	2	3	4	5	U
10	Zero tolerance for corruption, discrimination, victimisation and harassment through open policies	1	2	3	4	5	U
11	Encourage local employability schemes	1	2	3	4	5	U
12	Offer quality work experience for construction trades students on apprentices within local communities	1	2	3	4	5	U
13	Encourage employee volunteering in the community with financial contributions and help in kind	1	2	3	4	5	U

C. On-site labour-productivity management

9. Rate the level of labour productivity on your sites, using the below-mentioned scale:

Very Low 1	Slightly low 2	Average 3	High 4	Very high 5

10. In your view, is the management approach in your organisation people-centred or production-centred?

People-centred		Production-centred	
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11. How do you think this management approach has affected productivity?

Not at all 1	To a little extent 2	To some extent 3	To a great extent 4	To a very great extent 5

12. Kindly rate the **extent** to which the management approach improves the **sustainability of skilled construction workers**, using the below-mentioned scale:

- 1 = No improvement
- 2 = Little improvement
- 3 = Some improvement
- 4 = Significant improvement
- 5 = Very significant improvement
- U = Unsure

Item	Management Approach	1	2	3	4	5	U
1	People-centred	1	2	3	4	5	U
2	Production-centred	1	2	3	4	5	U

13. Comment on what needs to be done to enhance the sustainability of workers through how they are managed:

Economically: _____

Socially: _____

Environmentally: _____

14. Kindly rate the **significance** of the people-centred management aspects to ensure **adequate employment treatment**, using the below-mentioned scale:

- 1 = Not significant
- 2 = Of little significance
- 3 = Somewhat significant
- 4 = Significant
- 5 = Very significant
- U = Unsure

Item	Aspects	1	2	3	4	5	U
1	Promote a consistent approach to the adoption and implementation of people-centred values	1	2	3	4	5	U
2	Build staff confidence in people-centred approaches	1	2	3	4	5	U
3	Improve consistency for workers and be flexible enough to allow for responsiveness to local differences	1	2	3	4	5	U
4	Reflect best practice and industry standards always through construction methods	1	2	3	4	5	U
5	Train staff on people-centred principles to drive practice and implement on sites	1	2	3	4	5	U
6	Provide adequate resources on targets for person-centred approaches and suitable implementation strategies	1	2	3	4	5	U
7	Promote continuous improvement on construction methods, whilst motivating the workers	1	2	3	4	5	U
8	Encourage teamwork through highlighting its benefits	1	2	3	4	5	U
9	Supervise the workers appropriately upholding their rights	1	2	3	4	5	U
10	Respect local cultures through having a flexible management structure	1	2	3	4	5	U
11	Recognise and respect the individual differences in the workplace and exploit the positives, while proactively rectifying the negatives	1	2	3	4	5	U
12	Adopt a functioning reward culture for construction-skilled workers	1	2	3	4	5	U

13	Invoke commitment in workers through cultivating a sense of belonging	1	2	3	4	5	U
14	Inclusive management – including the workers and their views in task-related decisions	1	2	3	4	5	U
15	Accessible management should cultivate an open-door policy, where workers are able to raise their concerns and get adequately re-dressed	1	2	3	4	5	U

D. Sustainability literacy of Technical and Vocationally Trained Workers

15. Describe what you understand by sustainable literacy

16. Kindly rate the significance of the sustainable learning objectives to ensure **adequate productive work**, using the below-mentioned scale:

- 1 = Not significant
- 2 = Of little significance
- 3 = Somewhat significant
- 4 = Significant
- 5 = Very significant
- U = Unsure

Item	Learning objective	1	2	3	4	5	U
1	The learner is able to publicly demand and support policies that promote social and economic justice in the workplace	1	2	3	4	5	U
2	The learner knows conceptions of positive physical and mental health well-being instruction and can critically reflect on them in the workplace.	1	2	3	4	5	U
3	The learner knows the socio-economic dimensions of health and well-being required in the workplace	1	2	3	4	5	U
4	The learner knows the relevant prevention strategies to foster positive physical and mental well-being in the workplace	1	2	3	4	5	U
5	The learner understands the importance of education, as a driver of sustainable development	1	2	3	4	5	U
6	The learner is able to feel responsible for his water use on construction sites	1	2	3	4	5	U
7	The learner is able to communicate the need for energy efficiency and sufficiency	1	2	3	4	5	U
8	The learner understands the concept of decent work	1	2	3	4	5	U
9	The learner is able to facilitate improvements related to working conditions	1	2	3	4	5	U

10	The learner is able to identify his rights and clarify his values and needs related to work	1	2	3	4	5	U
11	The learner understands that inequality is a major driver for societal problems and individual dissatisfaction	1	2	3	4	5	U
12	The learner is able to communicate the need for sustainable practices in production	1	2	3	4	5	U
13	The learner is able to challenge cultural and societal orientations in consumption and production	1	2	3	4	5	U
14	The learner understands the consequences of climate change on productivity	1	2	3	4	5	U
15	The learner understands the conservation strategies that can be implemented during tasks	1	2	3	4	5	U

E. Sustainable literacy of On-the-job trained workers (Worker Exempted – WX)

17. Does your organisation undertake on-the-job training?

Yes		No	
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18. If, No, do you employ on-the-job trained workers (WX) on your sites?

Yes		No	
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19. If, yes, what percentage of workers are on-the-job trained?

0 - 25%		26 - 50%		51 - 75%		76 - 100%	
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20. If yes to Q17, do you have an on-the job training manual?

Yes		No	
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21. If No to Q20, describe the process of your on-the-job training programme

22. If yes, kindly rate the **extent** to which **on-the job training includes the requirements of sustainable dimensions**, using the below-mentioned scale:

- 1 = Not at all
- 2 = To a little extent
- 3 = To some extent
- 4 = To a great extent
- 5 = To a very great extent
- U = Unsure

Item	Dimension	1	2	3	4	5	U
1	Economic	1	2	3	4	5	U
2	Social	1	2	3	4	5	U
3	Environmental	1	2	3	4	5	U

23. Kindly rate the **significance** of the sustainable learning objectives to ensure a **safe working environment**, using the below-mentioned scale:

- 1 = Not significant
- 2 = Of little significance
- 3 = Somewhat significant
- 4 = Significant
- 5 = Very significant
- U = Unsure

Item	Learning objective	1	2	3	4	5	U
1	The learner is able to publicly demand and support policies that promote social and economic justice	1	2	3	4	5	U
2	The learner knows the concepts of health, hygiene and well-being and can critically reflect on them.	1	2	3	4	5	U
3	The learner knows the socio-economic dimensions of health and well-being	1	2	3	4	5	U
4	The learner knows the relevant prevention strategies to foster positive physical and mental well-being in the workplace.	1	2	3	4	5	U
5	The learner is able to communicate the need for energy efficiency and sufficiency.	1	2	3	4	5	U
6	The learner understands the concept of decent work.	1	2	3	4	5	U
7	The learner is able to facilitate any improvements related to the working conditions.	1	2	3	4	5	U
8	The learner is able to identify his rights and clarify his values and the needs related to work.	1	2	3	4	5	U
9	The learner is able to communicate the need for sustainable practices in production.	1	2	3	4	5	U
10	The learner knows the consequences of climate change	1	2	3	4	5	U
11	The learner understands basic ecology and its importance on construction sites.	1	2	3	4	5	U
12	The learner is able to understand conservation strategies on construction sites.	1	2	3	4	5	U

F. Decent working conditions in productivity measurement

24. Does your organisation generate productivity outputs on-site?

Yes		No	
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25. If No, where do you get the outputs you utilise?

26. Kindly rate the **significance** of the decent working conditions, given below, to ensure **improved productive work**, using the below-mentioned scale:

- 1 = Not significant
- 2 = Of little significance
- 3 = Somewhat significant
- 4 = Significant
- 5 = Very significant
- U = Unsure

Item	Decent working conditions	1	2	3	4	5	U
1	Provision of adequate occupational health, safety and wellbeing requirements on sites	1	2	3	4	5	U
2	Optimum human factor (ergonomics) interventions on sites (<i>a system of interacting components, which include the worker, both the physical and organisational work environment, the task and the workspace</i>).	1	2	3	4	5	U
3	Provision of sufficient personal protective equipment for workers.	1	2	3	4	5	U
4	Appropriate forecasting and planning for various climatic conditions.	1	2	3	4	5	U
5	Ensuring the maximum standard working time (44 hrs per week) is adhered to for all workers,	1	2	3	4	5	U
6	Satisfactory working premises that enable enhanced worker efficiency,	1	2	3	4	5	U
7	Provision of adequate work-related welfare facilities on construction sites,	1	2	3	4	5	U

27. Do you perceive that failure to consider these conditions has an impact in ascertaining realistic productivity outputs? If yes, please explain.

G. Sustaining Labour productivity performance measurement

28. What do you understand by labour productivity performance measurement?

29. Comment on the need for sustaining labour productivity.

28. Kindly rate the **significance** of the proposed sustainability performance indicators to ensure the **sustainability of labour productivity**, using the below-mentioned scale:

- 1 = Not significant
- 2 = Of little significance
- 3 = Somewhat significant
- 4 = Significant
- 5 = Very significant
- U = Unsure

Item	Proposed sustainability performance indicators	1	2	3	4	5	U
1	Labour force participation rate	1	2	3	4	5	U
2	Employment by status in employment	1	2	3	4	5	U
3	Labour underutilisation	1	2	3	4	5	U
4	Employees with recent job training	1	2	3	4	5	U
5	Employment with excess working time (44 hours per week)	1	2	3	4	5	U
6	Time-related underemployment rates	1	2	3	4	5	U
7	Paid annual leave	1	2	3	4	5	U
8	Unusual hours (e.g. night work)	1	2	3	4	5	U
9	Maternity protection	1	2	3	4	5	U
10	Forced labour rate	1	2	3	4	5	U
11	Precarious employment rate	1	2	3	4	5	U
12	Subsistence worker rate	1	2	3	4	5	U
13	Occupational segregation by sex	1	2	3	4	5	U
14	Measure of discrimination	1	2	3	4	5	U
15	Occupational injury frequency rate (fatal and non-fatal)	1	2	3	4	5	U
16	Time lost due to occupational injuries	1	2	3	4	5	U
17	Share of population above pensionable age benefiting from construction workers' pensions	1	2	3	4	5	U
18	Public social security expenditure (proportion of Gross Domestic Product)	1	2	3	4	5	U
19	Share of economically active population contributing to a construction workers' pension scheme	1	2	3	4	5	U
20	Trade union density rate	1	2	3	4	5	U
21	Collective bargaining coverage rate	1	2	3	4	5	U
22	Days missed due to strikes and lockouts	1	2	3	4	5	U
23	Labour productivity growth rate	1	2	3	4	5	U
24	Income inequality	1	2	3	4	5	U

25	Sustainable literacy levels	1	2	3	4	5	U
26	Environmental impact of labour administration	1	2	3	4	5	U

29. Please comment on any other issue related to integrating sustainability dimensions in construction labour-productivity determinants.

Thank you for participating in this questionnaire

APPENDIX B: QUESTIONNAIRE FOR EDUCATORS AND REGULATORS

Nelson Mandela University
Department of Quantity Surveying
Questionnaire
Educators and Regulators

Date: 3 September 2018

Dear Respondent,

RE: PARTICIPATION IN SURVEY: Integrating sustainability dimensions into construction labour productivity determinants in Zimbabwe

I am a PhD candidate in the Department of Quantity Surveying, Nelson Mandela University, Port Elizabeth, South Africa. I am conducting a research project entitled: "Integrating sustainability dimensions into construction labour productivity determinants in Zimbabwe" (Ethics clearance number: H16-ENG-BQS-001)

This study seeks to explore the sustainable development dimensions which can be integrated into the construction labour productivity determinants for ensuring successful delivery of projects in Zimbabwe.

I kindly request your participation in the study by completing the attached questionnaire that should not take more than 30 minutes of your time to complete. Respondents were purposively selected from all the relevant regulatory institutions and educators from technical and vocational training institutions in Harare and Bulawayo.

The information gathered will be confidential and research data will be anonymous. Thus, you are not requested to provide personal information and any other information not relevant to the study. Furthermore, you are assured that your participation is purely voluntary and that you can withdraw from participation in the study at any point without fear of reprisal.

The completed questionnaire will be collected from your offices; or you can email it to the following email address: tirivavimoyo@gmail.com

Yours sincerely,
Tirivavi Moyo (*PhD Candidate*)
Cell number: 0773054568

A. Profile of the Respondents (Stakeholders)

1. Please indicate your gender

Male		Female	
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2. Please indicate the generation you were born in

Baby Boomer (1946 - 1960)		Generation X (1961 - 1979)	
Generation Y (1980 - 1994)		Generation Z (1995 - present)	

3. Please indicate your designation

Vocational Training Lecturer	
National Social Security Authority Inspectorate	
Environmental Management Agency Inspectorate	
National Employment Council for the Construction Industry Inspectorate	
National Manpower Advisory Council	

4. Please indicate your level of education

Certificate		Diploma		Degree	
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5. Please indicate your qualification_____

6. Please indicate your years of construction-industry experience

1-5 Years		6-10 Years	
10-15 Years		15+ Years	

B. Sustainability of Labour-productivity performance

1. What do you understand by labour-productivity performance measurement?

2. Based on your experience and knowledge, please comment on the need for sustained higher labour productivity

4. Kindly rate the **significance** of the proposed sustainability performance indicators to ensure the **sustainability of labour productivity**, using the below-mentioned scale:

- 1 = Not significant
- 2 = Of little significance
- 3 = Somewhat significant
- 4 = Significant
- 5 = Very significant
- U = Unsure

Item	Proposed sustainability performance indicators	1	2	3	4	5	U
1	Labour force participation rate	1	2	3	4	5	U
2	Employment by status in employment	1	2	3	4	5	U
3	Labour underutilisation	1	2	3	4	5	U
4	Employees with recent job training	1	2	3	4	5	U
5	Employment with excess working time (44 hours per week)	1	2	3	4	5	U
6	Time-related underemployment rate	1	2	3	4	5	U
7	Paid annual leave	1	2	3	4	5	U
8	Unusual hours (e.g. night work)	1	2	3	4	5	U
9	Maternity protection	1	2	3	4	5	U
10	Forced labour rate	1	2	3	4	5	U
11	Precarious employment rate	1	2	3	4	5	U
12	Subsistence worker rate	1	2	3	4	5	U
13	Occupational segregation by sex	1	2	3	4	5	U
14	Measure of discrimination	1	2	3	4	5	U
15	Occupational injury frequency rate (fatal and non-fatal)	1	2	3	4	5	U
16	Time lost due to occupational injuries	1	2	3	4	5	U
17	Share of population above pensionable age benefiting from construction workers' pension	1	2	3	4	5	U
18	Public social security expenditure (proportion of Gross Domestic Product)	1	2	3	4	5	U
19	Share of economically active population contributing to a construction worker's pension scheme	1	2	3	4	5	U
20	Trade union density rate	1	2	3	4	5	U
21	Collective bargaining coverage rate	1	2	3	4	5	U
22	Days missed due to strikes and lockouts	1	2	3	4	5	U
23	Labour productivity growth rate	1	2	3	4	5	U

24	Income inequality	1	2	3	4	5	U
25	Sustainability literacy levels	1	2	3	4	5	U
26	Environmental impact of labour administration	1	2	3	4	5	U

5. Please comment on any other issue related to integrating sustainability dimensions into construction-labour productivity determinants?

Thank you for participating in this questionnaire

**APPENDIX C: INTERVIEWER-ADMINISTERED QUESTIONNAIRE FOR
CONSTRUCTION SKILLED AND SEMI-SKILLED WORKERS**

**Nelson Mandela University
Department of Quantity Surveying**

**Interviewer- Administered Questionnaire
Construction skilled and semi-skilled workers
A Profile of Respondents**

1. Please indicate your gender

Male		Female	
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2. Please indicate the generation you were born in

Baby Boomer (1946 - 1960)		Generation X (1961 - 1979)	
Generation Y (1980 - 1994)		Generation Z (1995 - present)	

3. Please indicate your trade

Bricklayer/Block layer	
Carpenter/Joiner	
Painter	

4. Your National Employment Council Class?

Class 1		Class 2	
Class 3		Class 3	
Worker Exempted			

5. Please indicate your level of education

No Minimum 'O' level		Minimum 'O' level		Certificate		Diploma	
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6. Please indicate your years of experience within the construction industry

1-5 Years		6-10 Years	
10-15 Years		15+ Years	

B. Corporate social responsibility strategies

1. What extent is your understanding of corporate social responsibility?

Very Low Extent 1	Low Extent 2	Average 3	High Extent 4	Very high Extent 5

2. What do think on implementation of labour related social responsibility strategies?

Very Low 1	Slightly low 2	Average 3	High 4	Very high 5

3. Do you think your organisation can do more for you in terms of social responsibility?

Yes		No	
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4. Kindly rate the significance of the labour related strategies, given below, to ensuring **social security of workers**: where

- 1 = Not significant
- 2 = Of little significance
- 3 = Somewhat significant
- 4 = Significant
- 5 = Very significant
- U = Unsure

Item	Strategy	1	2	3	4	5	U
1	Establish an environmental management system that transfers good practices to the communities	1	2	3	4	5	U
2	Train staff on ways to reduce environmental footprint	1	2	3	4	5	U
3	Train staff on the effects and need of minimisation of consumption of natural resources within their communities	1	2	3	4	5	U
4	Train staff on strategies to reduce emissions of hazardous substances	1	2	3	4	5	U
5	Involve employees in business decisions that affect them and improve the work environment	1	2	3	4	5	U
6	Offer outplacement services, retraining and severance benefits when closures and retrenchments are imminent	1	2	3	4	5	U
7	Extend training to life management, retirement planning and care of dependents	1	2	3	4	5	U

8	Be open to flexi-time and other work-life balance policies for construction skilled workers	1	2	3	4	5	U
9	Establish policies to ensure well-being of all employees and the public	1	2	3	4	5	U
10	Zero tolerance to corruption, discrimination and harassment through open policies	1	2	3	4	5	U
11	Encourage local employability schemes	1	2	3	4	5	U
12	Offer quality work experience for construction trades students within local communities	1	2	3	4	5	U
13	Encourage employee volunteering in the community with financial contributions and help in kind	1	2	3	4	5	U

C. On-site productivity management

5. In your view, is the management approach in your construction companies people-centred or production-centred or production-centred?

People-centred		Production-centred	
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6. Rate the level of labour productivity on your sites. *Tick appropriate box*

Very Low 1	Slightly low 2	Average 3	High 4	Very high 5

7. To what extent has this contributed to your productivity

Very Low Extent 1	Low Extent 2	Average 3	High Extent 4	Very high Extent 5

8. Kindly rate the significance of the people centred management aspects, given below, ensuring **adequate employment treatment**: where

- 1 = Not significant
- 2 = Of little significance
- 3 = Somewhat significant
- 4 = Significant
- 5 = Very significant
- U = Unsure

Item	Aspects	1	2	3	4	5	U
1	Promote a consistent approach to the adoption and implementation of people-centred values	1	2	3	4	5	U
2	Build staff confidence in people-centred approaches	1	2	3	4	5	U

3	Improve consistency for workers and be flexible enough to allow for responsiveness to local differences	1	2	3	4	5	U
4	Reflect best practice and industry standards always through construction methods	1	2	3	4	5	U
5	Train staff on people centred principles to drive practice and implement on sites	1	2	3	4	5	U
6	Provide adequate resources on targets for person-centred approaches and suitable implementation strategies	1	2	3	4	5	U
7	Promote continuous improvement on construction methods whilst incentivising the workers	1	2	3	4	5	U
8	Encourage teamwork through highlighting its benefits	1	2	3	4	5	U
9	Supervise the workers appropriately upholding their rights	1	2	3	4	5	U
10	Respect local cultures through having a flexible management structure	1	2	3	4	5	U
11	Recognise and respect individual differences in the workplace and exploit the positives while proactively rectify the negatives	1	2	3	4	5	U
12	Adopt a functioning reward culture for construction skilled workers	1	2	3	4	5	U
13	Invoke commitment in workers through cultivating a sense of belonging	1	2	3	4	5	U
14	Inclusive management- include the workers and their views in task related decisions	1	2	3	4	5	U
15	Accessible management- management should cultivate an open-door policy where workers are able to raise their concerns and get adequate re-dress	1	2	3	4	5	U

D Training in vocational training institutions (Class 1 to 4 only)

9. Rate your understanding of sustainability literacy?

Very Low 1	Slightly low 2	Average 3	High 4	Very high 5

10. To what extent does your training incorporate sustainability literacy?

Very Low Extent 1	Low Extent 2	Average 3	High Extent 4	Very high Extent 5

11. Kindly rate the significance of the sustainability learning objectives, given below, to ensuring **adequate productive work**: where

- 1 = Not significant
- 2 = Of little significance
- 3 = Somewhat significant

- 4 = Significant
- 5 = Very significant
- U = Unsure

Item	Learning objective	1	2	3	4	5	U
1	The learner is able to publicly demand and support policies that promote social and economic justice, in the workplace	1	2	3	4	5	U
2	The learner knows conceptions of positive physical and mental health well-being instruction and can critically reflect on them within the workplace.	1	2	3	4	5	U
3	The learner knows the socio-economic dimensions of health and well-being required in the workplace	1	2	3	4	5	U
4	The learner knows relevant prevention strategies to foster positive physical and mental health well-being in the workplace	1	2	3	4	5	U
5	The learner understands the importance of education as a driver of sustainable development	1	2	3	4	5	U
6	The learner is able to feel responsible about their water use on construction sites	1	2	3	4	5	U
7	The learner is able to communicate the need for energy efficiency and sufficiency	1	2	3	4	5	U
8	The learner understands the concepts of decent work	1	2	3	4	5	U
9	The learner is able to facilitate improvements related to working conditions	1	2	3	4	5	U
11	The learner is able to identify their rights and clarify their values and needs related to work	1	2	3	4	5	U
12	The learner understands that inequality is a major drive for societal problems and individual dissatisfaction	1	2	3	4	5	U
13	The learner is able to communicate the need for sustainable practices in production	1	2	3	4	5	U
14	The learner is able to challenge cultural and societal orientations in consumption and production	1	2	3	4	5	U
15	The learner understands the consequences to climate change on productivity	1	2	3	4	5	U
16	The learner understands conservation strategies that can be implemented during tasks	1	2	3	4	5	U

E. On-the-job training schemes (WX only)

12. Rate your understanding of sustainability literacy?

Very Low 1	Slightly low 2	Average 3	High 4	Very high 5

13. To what extent does your training incorporate sustainability literacy?

Very Low Extent 1	Low Extent 2	Average 3	High Extent 4	Very high Extent 5

13. Kindly rate the significance of the sustainability learning objectives, given below, to ensuring **a safe working environment**: where

- 1 = Not significant
- 2 = Of little significance
- 3 = Somewhat significant
- 4 = Significant
- 5 = Very significant
- U = Unsure

Item	Learning objective	1	2	3	4	5	U
1	The learner is able to publicly demand and support policies that promote social and economic justice	1	2	3	4	5	U
2	The learner knows conceptions of health, hygiene and well-being and can critically reflect on them.	1	2	3	4	5	U
3	The learner knows the socio-economic dimensions of health and well-being	1	2	3	4	5	U
4	The learner knows relevant prevention strategies to foster positive physical and mental health well-being in the workplace	1	2	3	4	5	U
5	The learner is able to communicate the need for energy efficiency and sufficiency	1	2	3	4	5	U
6	The learner understands the concepts of decent work	1	2	3	4	5	U
7	The learner is able to facilitate improvements related to working conditions	1	2	3	4	5	U
8	The learner is able to identify their rights and clarify their values and needs related to work	1	2	3	4	5	U
9	The learner is able to communicate the need for sustainable practices in production	1	2	3	4	5	U
10	The learner knows the consequences to climate change	1	2	3	4	5	U
11	The learner understands basic ecology and its importance on construction sites	1	2	3	4	5	U
12	The learner is able to understand conservation strategies on construction sites	1	2	3	4	5	U

F. Decent working conditions for Productivity measurement

14. To what extent is the issue of standard labour productivity outputs important in addressing the diminished labour productivity challenge?

Very Low Extent 1	Low Extent 2	Average 3	High Extent 4	Very high Extent 5

15. To what extent is the importance of working conditions in addressing the diminished labour productivity challenge?

Very Low Extent 1	Low Extent 2	Average 3	High Extent 4	Very high Extent 5

15. Kindly rate the significance of the decent working conditions, given below, to ensure **heightened productive work**: where

- 1 = Not significant
- 2 = Of little significance
- 3 = Somewhat significant
- 4 = Significant
- 5 = Very significant
- U = Unsure

.Item	Decent work condition	1	2	3	4	5	U
1	Provision of adequate occupational safety and health organisation on sites	1	2	3	4	5	U
2	Satisfactory ergonomics on sites	1	2	3	4	5	U
3	Provision of sufficient personal protective equipment for workers	1	2	3	4	5	U
4	Appropriate forecasting and planning for various climatic conditions	1	2	3	4	5	U
5	Ensuring the maximum standard Working time (44hrs per week) is adhered to for all workers	1	2	3	4	5	U
6	Satisfactory working premises that enable enhanced worker efficiency	1	2	3	4	5	U
7	Provision of adequate work-related welfare facilities on construction sites	1	2	3	4	5	U

Thank you for participating

CONFERENCE AND JOURNAL PAPERS

CONFERENCE PAPERS PEER REVIEWED

Moyo, T., Crafford, G. & Emuze, F. 2018. Decent Working Conditions for Improved Construction Labour Productivity on Zimbabwean Building Projects: A Pilot Survey, SACQSP INTERNATIONAL RESEARCH CONFERENCE 2018, 30 September 2018 to 1 October 2018, Rosebank, South Africa

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