Environmental Management Accounting Policies and Practices within the Higher Education Sector: An Exploratory Study of the University of Kwazulu Natal

The study attempted to evaluate the environmental management accounting (EMA) processes at UKZN. UKZN, a South African university generates the same direct and indirect environmental impacts as the higher education sector worldwide. This is significant within the context of the South African environment which is constantly plagued by having to effectively manage the already scarce resources of water and energy, evident through imposition of water and energy restrictions over the recent years. The research studied the experiences of key managers within UKZN, with the purpose of understanding the current state of accounting practices for managing major environmental costs within the university. A case study approach, comprising semi-structured interviews of key personnel involved in Management Accounting, Environmental Management and Academic Schools within the university was adopted. Content analysis was performed on the transcribed interview data. A Theoretical Framework derived from literature was adopted to guide data collection and focus the study. The findings revealed a distinct lack of EMA utilization within the university. There was no distinct policy on EMA, resulting in minimal environmental cost information being brought to the attention of senior management. The university embraced the principles of environmental sustainability however efforts to improve internal environmental accountability primarily from an accounting perspective was absent. The findings are consistent with existing literature. EMA is being widely acknowledged as a key management tool that can facilitate improved financial and environmental performance through enhanced environmental accountability. Educational institutions such as universities form part of the service sector and directly impact on the environment through the consumption of paper, energy and water and solid waste generated, with the associated demands. A structured approach to EMA will assist the university achieve its strategic environmental goals.

Keywords: Environmental Management Accounting (EMA), Environmental Impacts, Higher Education, Southern Africa.

Introduction

EMA is viewed as a management instrument that utilises environmental accountability to enhance financial and environmental performance of an entity. It encompasses both the monetary and physical aspects of environmental impacts generated by organisations (Christ and Burritt, 2013).

Environmental management and EMA have been the focus point of many industries, both locally and abroad. Historically, research has been concentrated primarily on the manufacturing industry. Manufacturing industries generate the greatest proportion of environmental impacts, and hence have been the primary focus of research.
Service industries are also an integral component of environmental management as they have significant impacts, both direct and indirect (Bennett et al., 2006). Educational institutions such as universities form part of the service sector. The direct impacts on the environment are those related to the use of paper, and solid waste generation along with the associated energy and water demands. Indirect impacts stem from changes in environmental behaviour via education and research (Chang, 2007).

Universities have a role to play in the preservation of the environment and this study evaluated the EMA processes at UKZN. UKZN, like most universities, has the same direct and indirect environmental impacts. The South African environment is constantly faced with having to effectively manage the already scarce resources of water and energy. Over the last two years this has been very evident through the imposition of energy and water restrictions. UKZN operates out of five campuses which face the same energy and water shortages prevalent within the South African environment. The institution, being the largest university in the province of KwaZulu-Natal, has an indirect environmental impact via changing environmental behaviour through education and research. By the creation of awareness and improving environmental performance on the campuses, the university capitalises on the prospect of raising awareness and imparting knowledge relating to environmental issues to students. Per the 2007–2016 UKZN Strategic Plan Document (UKZN Strategic Plan 2007–2016, revised June 2012), the university has endeavoured to manage and run itself in an environmentally conscious way, whereby it fosters a culture of responsible, ethical and sustainable use of natural resources. The Westville campus is situated upon a conservatory and this itself imposes an environmental duty on the institution.

This study aims to investigate EMA within the service sector, namely at universities. A very limited degree of research has been conducted on the service sector, including universities, which presents an opportunity to investigate environmental management at universities with the objective of managing environmental costs and improving the environmental performance of universities. Thereby creating awareness of having a structured approach to environmental management to achieve the strategic environmental goals of the university. The objective of the study is to understand the existing EMA policies and practices that UKZN employs.

Research questions which formed the theoretical basis of this study were developed. These questions primarily focused on the research objectives. The extension of EMA to universities is relatively unchartered research territory, and it was therefore essential to direct the study towards environmental costs (Deegan, 2017). As EMA is a system that encompasses accounting for managing and reporting on environmental costs, the following research questions were utilised:

1. Does the university’s accounting system separately identify and measure specific types of the major environmental costs? If not, what is the reason?
2. How are the major monetary and physical environmental costs being captured into the current accounting system?

3. How are the major environmental costs used to promote external environmental reporting and internal management of the environment?

The introduction served to provide a background to the study, along with the underlying reasons for conducting this research. The service sector generates its own set of environmental impacts and this study highlights the sector in the form of universities. This study has helped understand EMA's role and integration into the higher education sector, thereby helping to improve financial and environmental performance through increased accountability for the environment. A review of relevant literature, the formulation of an appropriate research methodology, together with a discussion on the findings and conclusion will follow.

The contribution of the study will be able to inform the higher education sector as to the accounting and management of the major environmental costs. This information will facilitate the identification of the limitations within the existing management information systems currently in place at universities, specifically concerning the management of environmental costs. The higher education sector can be provided with information on how environmental costs can be better accounted for and managed. EMA can be extended to the higher education sector.

**Literature Review**

*Environmental Management Accounting*

The turn of the twenty first century has brought with it an increased awareness of environmental preservation. The importance of environmental preservation has filtered through to the business environment. Environmental management has become a priority for big business and is a term that is frequently used in EMA. The reason for big businesses prioritising environmental management is as a result of environmental accountability, which holds decision makers within an organisation responsible for environmental performance, which in turn drives continuous environmental improvement within the organisation. Organisations are currently under pressure to assure future sustainability and growth. As such, many have focused attention and resources toward environmental aspects, with the intention of reducing environmental impacts and improving environmental performance (Guenther et al., 2016). Strict environmental regulations and market pressures require that organisations adopt quality and environmental management as part of their strategic management. Adoption and implementation of environmental management can result in significant savings (Schaltegger et al., 2010).
EMA encompasses both the monetary and physical aspects of environmental accounting, hence information on material uses, labour hours and other costs is required for both these elements (Chang, 2007). This distinction between monetary and physical enables management to manage and measure the non-financial environmental performance as well. Efforts to promote EMA focus on developing tools to help identify or define environmental costs and explain how EMA is used and applied within organisations. Environmental costs are the environment-related costs that an organisation incurs. They are broken down into two cost categories, namely internal and external costs. The internal costs are those that have a direct impact on the organisation’s profitability, and for which the organisation is directly accountable, whereas the external costs are those costs that the society bears. It is the cost that society pays as a result of an organisation’s operation within that society (Deegan, 2017).

Environmental Management Accounting and the Higher Education Sector

The service sector has been underrated in terms of the attention it has received regarding environmental management research. The service sector organisations do contribute to environmental wastes and do generate environmental impacts. Although these impacts are not as significant as those from the manufacturing sector, they still do need to be managed and accounted for. The higher education sector falls within the umbrella of the service sector.

The higher education sector has a role to play in sustainable development through education and internal practices. This lends itself to EMA in the sense that the direct impacts on the environment are impacts related to the use of paper, and solid waste generation along with the associated energy and water demands, which fall under the umbrella of internal practices. On the other hand, the indirect impacts stem from changes in environmental behaviour via education and research, which forms part of education (Chang, 2007). In regard to the higher education sector in the United Kingdom (UK), the initiatives aimed at environmental sustainability have only realised limited impacts to improve environmental performance (Schaltegger and Wagner, 2017). Although universities in Northern America report on environmental information, they only report on what has been done on the physical campus. Information related to actual environmental performance, environmental goals and strategies remains silent within the reports.

A strategic perspective can greatly enhance a university’s environmental management function; however, based on literature, it can be argued that this strategic perspective falls short due to the lack of involvement from members of the accounting function within universities. The means of measurement, reporting and management of environmental impacts is relevant to both the accounting and environmental-related divisions within an institution (Bennett and James, 2017). Implementing EMA is a means of promoting universities’ environmental accountability, as accounting is a key driver of improving environmental management. It is therefore important to involve individuals
from the accounting function in environmental management. EMA for universities provides the link between accounting and environmental management (Chang and Deegan, 2010).

Theoretical Framework

The literature reveals that the majority of EMA studies that have been carried out which focused on obtaining an understanding of the existing EMA processes adopted, if any, within the various sectors. The educational sector has not been a dominant sector for research, nor has much research been directed toward understanding the EMA policies that universities adopt and implement.

Two theoretical perspectives that have been derived from the requisite literature are reviewed next, in order to explain EMA adoption within the higher education sector. The perspectives come from the Contingency and Institutional theory. The contingency theory suggests that the design of organisational structures is dependent on the influence of certain environmental contingencies that may be present within the organisation (Otley, 2016). The definition of a contingency advocates that the effect of an organisational characteristic on the performance of that organisation is regulated by any internal or external variable (Dubey et al., 2017). The success of implementing a high level management accounting strategy may depend on the surroundings under which the strategy is to be used and implemented or the environment in which the organisation operates (Appelbaum et al., 2017). The institutional theory focuses on understanding why there is consistency in organisational forms and practices across organisations that result in organisations displaying similarities between each other (DiMaggio and Powell, 1991; Boxenbaum and Jonsson, 2017). Regarding this study, the institutional theory displays relevance, as its use has been supported by previous EMA researchers. These researchers argued that homogeneity arises in organisations subject to changes within their institutional environments, which can either contribute positively or negatively to the adoption of new organisational practices, including accounting (Bouma and van der Veen, 2002).

In the higher educational sector, universities are heavily dependent on government funding for survival. Funding from the government represents a large component of a university’s financial resources. Universities are required to report on their financial position, so that government may assess their financial sustainability, but universities are not required to report on environmental performance and as such, minimal to no emphasis is placed on accounting for the environmental resources consumed or waste generated. The number of universities that generate data regarding the use of paper and quantity of waste generated is minimal (Bennett et al., 2006). Providing an account of environmental costs would not become a priority for universities without the establishment of laws and regulations requiring the universities to do such.
Empirical Review

Many organisations are geared toward initiatives that are directed at reducing the environmental impacts related to their business activities. However, at the same time, organisations are facing many constraints in the transformation into environmentally conscious and responsible organisations (Doppelt, 2017). Having sound EMA policies and practices is a means for organisations to achieve their environmental objectives. Management systems within most organisations often rest with the manager concerned. However, to ensure the longevity of the organisation and effective use of resources, primarily natural resources, a system that is well designed and managed is essential (Harizanova, 2015; Kopnina and Blewitt, 2018). EMA is a system that can ensure the organisational objectives are met, in particular relating to environmental preservation. While organisations are significant contributors to causing and potentially controlling ecological problems, they could also obtain various benefits from practices that have a positive impact on the environment. EMA helps firms to work toward those potential benefits and to face their environmental responsibilities (Henri and Journeault, 2006).

The primary objective of EMA is to navigate through and control significant environmental impacts, which should have appropriate policies and practices as its foundation (Welford, 2016). The introduction and implementation of environmental standards such as ISO 14001 has prioritised organisational concerns aimed at reducing global pollution via the control of environmental impacts produced (Harizanova, 2015).

The use and application of EMA is constantly growing, and a review of literature displays a greater emphasis on the manufacturing sector than the service sector. This is due to the fact that fewer natural resources are used by the service sector and they have less environmental impact than the manufacturing sector. EMA implementation has been successfully applied, within both sectors, with the manufacturing sector showing a greater level of implementation due to the greater emphasis it receives, and the priority afforded to developing sound policies and practices regarding implementation and operation.

Methodology

The study is an exploratory study. The research design adopted to achieve the research objective was a qualitative approach, using a case study methodology. The study being of an exploratory nature as EMA at universities is a relatively unexplored area of research. A descriptive analytical approach was followed which dealt with the objective. As this study is qualitative, data was collected using interviews, direct observation and review of written documents. The interviews were in-depth interviews so as to facilitate a more comprehensive understanding of the world within which the interviewees’
operate (Chang, 2007). Research was conducted via a document/textual review of the policies and practices employed, the financial statements, and using transcribed interviews. The interviews were focused on key level management within the following operational areas of the university:

- Upper executive level management
- Environmental management
- Management accounting

A thematic analysis was the method utilised to analyse the data. The following themes formed the basis of the interview questions:

- Management of major environmental costs
- Accounting for major environmental costs

The research study was conducted in three phases. The first phase, also known as “Phase One”, considered the selection of research participants. The second phase of the study, also known as the “Phase Two”, focused on the data collection. The third phase of the study, also known as the “Phase Three”, dealt with the transcription and translation of the collected data.

This study explored the practices and policies of EMA within the service sector, specifically the university environment in South Africa. This novel study examined the practices and policies of EMA in UKZN. The case study for this research study was restricted to UKZN due to challenges such as access, time, and cost constraints concerning other universities within South Africa. Hence, the research participants for the study comprised relevant staff members and officials of UKZN who were instrumental in the provision of data required to achieve the pre-set research objectives.

This study's objective focused on understanding the current accounting policies and practices in UKZN for environmental management. Questions for participants from the environmental management function and questions for participants from the management accounting function were captioned in two categories of questions in the questionnaire. It was therefore necessary to select at least one participant from the Division of Management Accounting / UKZN Finance and Environmental Management / Institutional Planning and Governance to address the research objective. At the inception of the selection of research participants for the study, necessary departments as detailed above, and key persons within said departments, were identified and contacted for the purpose of the study.

This study utilises a content analysis approach to analyse the collected data. The objective of content analysis is to list concepts in the primary narrative, to ascertain the importance of each section of content via how frequently they are mentioned in the primary narrative (Remenyi, 2012). For conventional content analysis the coding categories are directly derived from the text, while for the directed approach initial coding is guided by theories
and existing relevant research findings. The summative content analysis involves observing frequencies of occurrences and comparing keywords and contents, followed by interpretation of the underlying context. This study adopted summative content analysis for coding of the data. In the context of this study, the initial codes signify the sub-categories of the research themes which were classified as either substantive sub-category or theoretical sub-category (Glaser, 1978). While the theoretical coding follows the substantive coding (Tacer and Ruzzier, 2015), this code serves as the relational model that links all substantive codes to the main category (Hernandez, 2009). Substantive coding comprises selective coding, which is a first level of abstraction whereby the transcripts and field notes are being coded (Tacer and Ruzzier, 2015). The semi-structured questionnaire was useful in gathering the qualitative data. The data was grouped into themes and sub-themes representing a summary of the participants’ responses. NVivo 12 was used to code participants’ views of and responses to the research question. In NVivo, labels are generated to organise texts into themes and sub-themes.

Findings and Results

The data was collected by means of conducting semi-structured interviews. The interview questions were carefully framed to elicit appropriate responses from the study participants. The questions were categorized to reflect the objective of study: to understand the existing EMA policies and practices that UKZN employs. The interviewees were drawn from six employees of UKZN cutting across upper executive level management, environmental management and management accounting employees. The interviews continued until data saturation had been attained, after which the interviews were stopped. In a qualitative study, data saturation is attained when adequate data to replicate a study has been collected (Fusch and Ness, 2015). In other words, data saturation implies that on the basis of the information that has been gathered, further information gathering is not necessary (Saunders et al., 2018).

UKZN Policy

The UKZN environment policy is anchored on the University Mission Statement, which is to “conserve the physical environment and foster a culture of responsible, ethical, sustainable use of natural resources”. Environmental policy at the university involves conscious efforts to protect the integrity of the environment through local, regional and international conservation of natural resources and biodiversity. As laudable as the policy is, UKZN has not been properly embraced and implemented by the university management. This makes the environmental responsiveness of the university sub-standard based on the data collected from the interview participants. It is necessary to reiterate that the UKZN environment policy is anchored in the University Mission Statement, which is to “conserve the physical environment and foster a culture
of responsible, ethical, sustainable use of natural resources.” Environmental policy at the university involves conscious efforts to protect the integrity of the environment through local, regional and international conservation of natural resources and biodiversity. The university proposed 14 principles upon which the institution’s environmental policy is based. Despite these 14 principles, the qualitative data collected revealed that UKZN does not have clear-cut policy on EMA in practice. However, the majority of the interview participants affirmed that provision is made for a distinct GL for costs incurred on environmental management.

The study considered the existing EMA policies and practices that UKZN employs under four distinct themes that emerged from the responses provided by the study participants. These themes include capital budgeting, cost allocation, environmental performance measurement and technological innovation.

The project map in Figure 4.1 illustrates the main themes that emerged from the data collected on EMA policies and practices at UKZN.

Figure 4.1. Project Map

Figure 4.1 above illustrates the themes that emerged from the responses provided by the study participants. The main themes include capital budgeting, cost allocation, environmental performance measurement and technological innovation. The main themes which gave rise to sub-themes are explained below.

Analysis of Data

EMA which is an integral part of the Sustainable Development Goals involves identifying, collecting, estimating, analysing and internal reporting of environmental cost for the environmental decision-making process (Vinayagamoorthi et al., 2012; Damayanti and Pentiana, 2018). Research entailed comprehending the existing EMA policies and practices that UKZN
employs. The qualitative data collected revealed that UKZN did not have a clear-cut policy on EMA. However, the majority of the interview participants affirmed that provision is made for a distinct general ledger (GL) for cost incurred on environmental management. Figure 4.1 above illustrates the themes that emerged from the study participants with respect to EMA policies and practices at the UKZN.

The word “Child” as depicted in the figure above does not connote any significant value but is a NVivo software label, which shows the source of data from the “Parent” node to the “child” node.

**Capital Budgeting**

The finding from the analysed qualitative data revealed that UKZN does not make provision for environmental management in the institution’s capital budgeting. The lack of budgetary provision reduces the opportunity to develop and enhance UKZN green behaviour. The capital budgeting theme has three sub-themes, which are approval by finance to raise awareness, environmental costs accountability and provision of EMA system. UKZN has an accounting system that caters for the capital budgeting and other finance functions of the institution. Various costs such as electricity, water and waste are provided for and approved by the finance unit of the institution. All the respondents affirmed that costs incurred on the environment are treated as expenses, which may be a contributory factor in the low level of awareness of environmental management accounting. Environmental accountability involves a process, which exposes the environmental behaviour of an organisation and individuals to the public, thereby creating a sense of legal obligation to better manage the environment (Paddock, 2003; Abate, 2016). The interview participants held different views on who is held accountable for the major environmental costs incurred by the institution. The differing views may be connected to the lack of clear-cut policy framework on EMA adopted by the institution. Organisations globally are becoming conscious of the impact of their activities on the environment. Therefore, governments and businesses have seen the need to put in place a holistic EMA system to enhance awareness about environmental activities. UKZN does not have any policy on EMA systems as evidenced by the comments of the interview participants. The lack of budgetary provision reduces the opportunity to develop and enhance UKZN’s green behaviour. Also, the study found that there was no congruent perspective amongst the participants on the issue of environmental accountability and who should be responsible for major environmental issues and costs within the university. Based on the interviews, it was further found that UKZN does not have any policy on EMA systems.

**Cost Allocation**

Cost allocation involves the process of identifying and assigning costs to an object (Guajardo and Rönnqvist, 2016; Andersen et al., 2016). Empirical
studies on EMA revealed that environmental costs are allocated to overhead accounts which are product-specific such as energy costs, water costs and waste management costs (Damayanti and Pentiana, 2018; Le and Nguyen, 2019). The sub-themes emerging from the cost allocation include accounting for major environmental costs, environmental costs information and separate GL accounts.

Accounting for major environmental costs through the traditional function of accounting is a major challenge for accounting professionals and academics. Findings from this study revealed that environmental costs are not separately accounted for. In other words, the university does not make provision within the accounting records for environmental costs. This could only be interpreted to mean that the university management does not place importance on the impact of the university activity on the environment. Environmental cost information was found to be lacking. According to the Organisation for Economic Co-operation and Development (OECD) (2007), environmental costs refer to costs associated with the actual or potential deterioration of natural assets due to economic activities. Environmental costs are considered as “useful tool for collecting, processing and providing information on environmental costs to managers aimed at sustainable development” (Le and Nguyen, 2019). Environmental costs information could be useful to the university management in improving environmental efficiency and responsiveness of the university. Responses from the study participants revealed that the university management does not have access to environmental costs information. Consistent with the comments of the study participants, previous studies revealed that environmental costs information could serve as a good proactive measure to improve the gathering and sharing of environmental information and also provide early warning to environmental issues which may demand urgent attention (OECD, 2007; Jing and Songqing, 2011). The data collected from the interview participants revealed that no special accounting record is made for environmental costs by the university. Rather, environmental costs are assigned to an overhead account and treated as expenses in the GL.

Environmental Performance Measurement

Environmental performance measurement refers to the EMA tool used in checking, reviewing, monitoring and evaluating environmental performance of an organisation (Tam et al., 2006; Chang, 2007). Three sub-themes emerged from the theme on environmental performance measurement, namely environmental reporting, key indices for environmental performance assessment and sustainability committee.

This study found that the university has mechanisms in place for assessing the performance of the environment. The reporting of environmental performance measurement may help to shape the decision-making process concerning the impact of the university activity on the environment. In other
words, environmental reporting provides an avenue on how the environmental performance of the institution can be improved based on the environmental performance assessment. However, the qualitative data collected revealed that the university does not produce reports on environmental performance. Information emerging from the qualitative data collected revealed that the university has formed a committee with a mandate for assessing the environmental performance the university.

Technological Innovation

Technological innovation was the last theme emerging on EMA policies and practices at UKZN. The study participants posited that the adoption of technology in the management of environmental costs and environment performance of the university will help reduce costs and make the environmental performance of the university more effective.

Discussion

Based on the findings from this study, the research objective which aimed to understand the existing EMA policies and practices that UKZN employs was achieved. The conclusion reached indicates that the existing management accounting practices are below standard, as exhibited by a lack of commitment and accountability for environmental-related issues. The current Environmental management accounting policies and practices in UKZN were extensively discussed. This study, which was aimed at establishing the EMA policies and practices, revealed the themes from the responses provided by the study participants. The outcome of the NVivo generated themes and sub-themes was based on the qualitative data collected which revealed capital budgeting, cost allocating, environmental performance measurement and technological innovation as the main themes which emerged from objective one.

The findings revealed that UKZN did not incorporate environment policies in the strategic plan of 2017 to 2021, which indicates the low priority placed on EMA by the university. It was clear that key stakeholders within the university do not consider environment costs incurred by the university as being significant. This was evident in the accounting system and how environmental costs are being treated as expenses. Whilst there is a general awareness of EMA amongst the stakeholders, it was observed that there is a lack of concern and pressure in dealing with EMA issues within the university. This could be a plausible explanation for lack of implementing the UKZN 14-point environmental policy statement. Furthermore, as suggested by the institutional theory, the effectiveness and implementation of EMA often results from institutional pressures and prioritisation. This implies that EMA within UKZN can be largely influenced institutionally.
Conclusion

This research study explored EMA practices and policies within the higher education sector as a subset of the service industry. This unique study was done in UKZN, a globally recognised university with five campuses in KwaZulu-Natal, South Africa. An exploration of EMA within the university environment in South Africa is a novel study which is crucial at this time considering the global environmental challenges.

Whilst this study is limited in scope and geographical perspectives, it creates possibilities for future studies in this emerging area of research. A possibility for future studies could be to inquire about EMA practices and policies across universities in South Africa or other institutions within the South African service industry such as banks, financial services, hospitality, etc.

The primary aim of this study was to explore EMA policies and practices within the service sector, particularly the higher educational sector. This led to an outline of the objective that is pertinent to the achievement of this aim as well as the determination of UKZN as the case for this study.

The objective sought to understand the adoption of EMA practices within UKZN, using a set of interview questions posed to a diverse group of stakeholders responsible for policies and practices of EMA within UKZN. Upon a thematic analysis of the responses and systematic discussion of findings, it can be concluded that there is a poor adoption level of EMA practices within the university. This conclusion was made based on thematic analysis across capital budgeting, cost allocation, environmental performance measurement and technological innovation.

Reference


