AN INVESTIGATION INTO CONDITIONS THAT ENABLE OR CONSTRAIN SUSTAINABLE PAPER USAGE AT RHODES UNIVERSITY

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NONDUMISO GLORIA MFENYANA

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Integrative Summary

Abstract and Introduction: The interest in this study was initiated by the rapid global transition of paper usage to digital systems in teaching and learning at tertiary institutions, particularly those that are signatories to the Talloires Declaration, which include Rhodes University (RU). It was discovered that there are two earlier studies (Leslie *et al.* 2009; Amutenya *et al.* 2009) that investigated and proposed recommendations towards sustainable paper usage at Rhodes University (RU). This study then investigated the response of RU to the proposed recommendations of the above mentioned studies and evaluated the conditions that promote and constrain sustainable paper usage in teaching and learning, and the attitudes of users thereof.

Purpose: This study intended to evaluate the conditions that promote or constrain paper usage and the attitudes and perceptions of staff and students regarding sustainable practices of paper usage at Rhodes University.

Methodological approach: The research adopted Rhodes University as a case. Data collected comprised of in-depth face-to-face interviews, online surveys and observations to identify certain types of behaviour during interviews and around campus. The three methods were used in order to get a comprehensive perspective of the findings. Purposive sampling was used for the interviews with a sample of the academic staff, support services staff and a student representative at Rhodes University. Interviews were guided by a set of semi-structured questions and were recorded, transcribed and analysed into categorical themes that were interpreted in line with the key questions of the study. The online survey sample was sent to 43 office administrators and to the entire body of student environmental representatives in the residences. Although the online survey responses were limited, the office administrators' data was analysed categorically with percentages and frequencies of the findings; the students' data however was too small to conduct any meaningful analysis.

Findings: The response to the recommendations made by the two earlier studies (Leslie *et al.* 2009; Amutenya *et al.* 2009) was evaluated. Findings reflected a positive response in that the mitigations had improved some of the processes in paper usage. For example, documents were mostly printed double-sided, and recycling and re-use campaigns were in place, even though there were still implementation constraints. Attitudes and perceptions of staff and

students on the conditions that enable or constrain sustainable paper usage were determined; these included a lack of information and knowledge about the link between sustainable paper usage and the environment, and the awareness campaigns followed by resistance to change. The proposed enablers towards a sustainable Rhodes University included training and awareness campaigns, policy-driven sustainability issues, the availability of resources, the promotion of digital systems to promote sustainable paper usage. The proposed digital interventions in teaching and learning and in other activities on campus received positive responses, although there were elements of traditional methods that were still practised on campus. In the proposed digital systems to promote a sustainable university, it will be essential to ensure that the systems are policy-driven and that there are awareness campaigns, training and the availability of necessary resources for efficient implementation towards minimisation of paper usage.

Keywords: Paper usage, Sustainability, Sustainable University, Electronic Document Management System (EDMS).

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List of Acronyms

ATN   Australian Technology Network

DVC   Deputy Vice Chancellor

EDMS Electronic Document Management System

EMS   Environmental Management System

HEI   Higher Education Institution

HR   Human Resources

ICT   Information and Communication Technology

IM   Instant Messaging

LMS   Learning Management System

MFD   Multi-function Device

RUEP   Rhodes University Environmental Policy

SHE   Safety, Health and Environment

SNS   Social-networking Sites

SMS   Short Message Service

SRC   Student Representative Council

UNBC University of Northern British Columbia

VC   Vice Chancellor

Section 1. The Context of the Study

This section introduces the purpose of the study as an investigation into the institutional response to mitigation and recommended monitoring protocol made by two earlier studies (Leslie *et al.* 2009:18; Amutenya *et al.* 2009:241) that aimed to address a sustainable use of paper at Rhodes University. The study also aimed to investigate the conditions that promote and constrain sustainable paper usage in teaching and learning and other activities by exploring the perceptions and attitudes of staff and students towards this.

1.1 Rhodes University

Rhodes University is located within the Makana Municipality, an area encompassing over 4 376 km^2 in Grahamstown, Eastern Cape (Caddick *et al.* 2007:2, Amutenya *et al.* 2009:238). The University consists of six faculties, 12 administration components, and support services. The majority of students are registered full-time, though some are part-time with short courses being made available to them (Amutenya *et al.* 2009:238). Rhodes University is known to be an establishment "Where leaders learn"; it also has a reputation of high performance and is committed to facing the challenges of the present and the future (Rhodes University Digest of Statistics 2011). The University feels a profound responsibility towards ensuring its graduates contribute towards the development of a sustainable future, both for South Africa and the human race. Rhodes has committed itself to improving the environmental awareness of its graduates by the development and adoption of the Rhodes University Environmental Policy (RUEP) and by ratifying the Talloires Declaration (Amutenya *et al.* 2009:238).

1.2 Evaluation of the earlier studies

In order to investigate the University's response to the recommendations made in the two earlier studies which focused on environmental sustainability, a brief description of the two studies are presented together with their primary recommendations.

In October 2009 an audit of the total carbon emissions at Rhodes University was conducted by a group of student researchers from the Environmental Science Department. The audit explored activities that contributed to the Institution's carbon footprint with the aim of promoting a sustainable university. The group identified specific areas for measuring carbon

output from all academic departments, administration and support divisions, and the residences on campus (Leslie *et al.* 2009:3). This was seen as being mandated by the University's Environmental Policy. The audit was also aimed at maintaining the reputation of the institution as it works towards finding ways of creating a sustainable environment through the reduction of carbon dioxide emissions, as is the case at other international universities (Leslie *et al.* 2009:1). Various elements such as electricity, gas, paper, waste and transport were found to contribute varying amounts to the total carbon footprint of Rhodes University. Even though electricity was found to contribute the highest levels of carbon emission, the nature of the academic enterprise which revolves around the production of written text justifies an investigation into paper usage, which was found in to be the second biggest contributor to the University's carbon footprint.

Paper usage was found to contribute just over two tonnes of carbon emissions and mitigations and monitoring strategies were therefore recommended to reduce this carbon footprint. Some of the mitigation schemes suggested by the study for minimising paper usage included double-sided printing, re-using paper, implementing effective recycling programmes and promoting the use of electronic media (Leslie *et al.* 2009:21; Amutenya *et al.* 2009:240). The study emphasised that implementing such mitigation strategies would have a twofold advantage: the preservation of the environment through a reduction in carbon emissions, and the potential for cost savings for the University.

The Leslie *et al.* (2009) study was published the same year as another significant study (Amutenya *et al.* 2009) at Rhodes University. Reporting on research conducted between May and September 2007, this study by Amutenya *et al.* (2009) was conducted with academic staff, secretaries and administration assistants in academic departments, the Printing and Stationary Unit and the Information and Technology Division. According to Amutenya *et al.* (2009:238), Rhodes University became a signatory to the Talloires Declaration, but was lagging in the implementation of environmental management as was evident in the lack of designated staff responsible for environmental issues.

Student hand-outs produced by academic staff were found to be a major contribution to paper usage at the University. Printing in the seven student computer laboratories was also found to be using more paper than academics (Amutenya *et al.* 2009:239,241). Therefore, the study made recommendations for a reduction in the amount of paper used and identified ways in which such practices could contribute to environmental management in general. One of the

recommendations was information dissemination through awareness raising campaigns that would encourage long-term paper re-use at Rhodes. Secondly, Amutenya *et al.* (2009:240) proposed a policy that requires student hand-outs to be printed on both sides of the paper. It was therefore suggested that the university invest in double-sided or "duplex" printers, which will not only bring about cost savings, but will also reduce the amount of paper used and thereby contribute to preserving the environment. A third suggestion offered by Amutenya *et al.* (2009:240) for reducing paper usage was that lecturers should make use of electronic forms of communication and information dissemination and only print out key notes. Fourthly, Amutenya *et al.* (2009: 240) and Smyth *et al.* (2010:1013) proposed that academic departments promote recycling and increase the availability of recycling bins as a means of increasing the rate of recycling. Similar to the Leslie *et al.* (2009) study, Amutenya *et al.* (2009:237) emphasised that reducing paper usage would not only promote sustainability, but would also have cost savings and promote a positive environmental reputation for the University.

In summary, both the Leslie *et al.* (2009:18) and the Amutenya *et al.* (2009:240) studies had the following recommendations in common:

- student hand-outs to be printed on both sides of paper sheets;

- a policy to be instituted to regulate such double-sided printing;

- the acquisition of "duplex" printers;

- the use of electronic media for communication and dissemination of information such as student hand-outs; and

- increase in the availability of recycling bins in order to promote a culture of recycling.

In addition, both studies demonstrated the importance of a sustainable university to promote its reputation and for its economic benefits. The primary aim of this study was to evaluate the institutional response to the recommendations of the aforementioned research reports and explore the conditions that promote or constrain sustainable paper usage and the overall perceptions and attitudes of the university.

Section 2. Literature Review

2.1 Sustainability and Sustainable Development

Even though Wright and Wilton (2012:120) indicate that the concepts of "sustainability" and "sustainable development" are handled differently by theorists and practitioners who feel that their meanings are fluid and independent, these concepts are often used interchangeably as they both integrate ecological, social and economic measurements (Membratu 1998:493). For the purpose of this study these concepts are therefore used interchangeably.

In its most basic definition, "sustainability" refers to a way of life that takes into account the limitations of the natural environment in supporting human activity (Gottlieb *et al.* 2012:193). King and Lessidrenska (2009:44) explained the concept of sustainability as a journey, not something that happens instantly but that requires everyone's commitment towards a planned goal; in so much that sustainability is the journey that counts and not the endpoint (Weybrecht 2010:31). Bowers (1997:192) highlights that sustainability recognizes the value of maintaining natural systems while developing and strengthening social capital through deliberation of the future. In what became known as the Brundtland Report, sustainable development is defined as "development that meets the needs of the present generation without compromising the ability of the future generation to meet their own needs" (Fakir 2001:123, Weybrecht 2010:13). This involves people in decision-making and addressing issues of social and environmental justice while ensuring that decisions are economically sustainable and viable.

To achieve sustainability is to ensure that people live well within the means of nature by preserving the environment, stimulating economic growth, and improving people's community (Alshuwaikhat and Abubakar (2008:1777). However, sustainability is always changing and evolving, especially in business environments. Managers may think that they have reached their goal of ensuring sustainability once a strategy is in place. The idea of sustainable development is therefore about creating a balance between environmental, economic and social concerns (Weybrecht 2010:14). It allows human systems to continue to maintain a production level or quality of life for future generations. The better people know the factors that influence the natural environment, the more careful and understanding they will be of their dependence on life-supporting ecological systems.

Sustainable development has gained recognition around the world as a conceptual framework for development that recognises interdependence between economic growth, social equity and environmental integrity (DEAT 2005:390). In addition, sustainable development focuses on improving the quality of life for all without increasing the use of natural resources beyond the carrying capacity of the environment. In the South African context, sustainable development is defined as development that does not use up resources more quickly than they are replaced by natural processes or new technology (White Paper on Environmental Management Policy 1999:18). Although social, economic and environmental factors are seen as pertinent aspects for development, governance and culture are overarching factors that promote sustainable development through developing structures at local, national and international levels (Weybrecht 2010:15). On a wider global level, sustainable development was prioritised at the United Nations Earth Summit held in Rio de Janeiro in 1992, as well as at the World Summit in 2002 (DEAT 2005:390).

2.2 Higher Education and Sustainability

Education is widely acknowledged as a means for advancing environmental sustainability as many believe that it is the key to altering the environmentally damaging patterns of humans and that it is the ultimate solution towards helping society break away from unsustainable ways of promoting human development (Gottlieb *et al.* 2012:193). Universities are not only able to raise awareness of environmental concerns in their curricula and teaching programmes, but are equally well positioned to advance our knowledge about environmental matters through research (Alshuwaikhat and Abubakar 2008:1779). In order to gain some credibility in the promotion of environmental awareness, universities are obliged to practice what they preach with regard to their operations and community engagement.

2.3 Global initiatives towards sustainability in Higher Education

Sustainability in education is of priority to many tertiary institutions. According to Lozano *et al.* (2011:8), different initiatives were formulated through declarations, charters, partnerships and conferences that were developed to foster sustainable development guidelines on how to incorporate sustainability into the university system. These initiatives emphasised the moral obligation for universities to work towards sustainable societies, focussing on environmental degradation, threats to society, and sustainable production and consumption for current and future generations.

In 1972, the Stockholm Declaration was the first to make reference to sustainability in higher education by acknowledging the interdependency between humanity and the environment and advocating several ways of achieving environmental sustainability (Alshuwaikhat and Abubakar 2008:1777). Since then, more academic declarations were developed with universities voluntarily signing these declarations to indicate their obligations to the mandate of sustainability (Alshuwaikhat and Abubakar 2008:1777). The University of Technology in Sydney, for example, began its sustainability journey after signing the Talloires Declaration in 1990 (Atherton and Giurco 2011:269) of which Rhodes University is also a signatory (Amutenya *et al.* 2009:238; Timmermans and Lotz-Sisitka 2003:1). The Talloires Declaration is a 10-point action plan for integrating sustainability and environmental literacy in teaching, research, operations and outreach at colleges and universities (Alshuwaikhat and Abubakar 2008:1777). As of February 2012, the Talloires Declaration has been signed by more than 430 universities in over 40 countries across the continents (ULSF 2008).

Another initiative, developed at Halifax (Canada) in 1991, provided a platform for university administrators to voice their concerns over the widespread degradation of the environment and the pervasive influence of poverty (Alshuwaikhat and Abubakar 2008:1777). Similarly, at a meeting culminating in the Swansea Declaration of 1993, participants drawn from over 400 universities in 47 different countries focused on finding ways in which the universities of the Association of Commonwealth Universities, their leaders, scholars and students might engage and deploy their resources to respond appropriately to the challenge of finding the balance between the human quest for economic and technological development, and environmental preservation (Alshuwaikhat and Abubakar 2008:1777). Furthermore, the University of Technology in Sydney also became a signatory to the Australian Technology Network (ATN) Declaration of Commitment to local, national and global sustainability. This initiative was designed to make sustainability a focus for teaching and learning, research, operations, infrastructure development and outreach globally (Atherton and Giurco 2011:269). Finally, Harvard University in the United States has a Green Campus Initiative that was established by students for all members of the academic community to promote sustainability issues (Evangelinos *et al.* 2009: 1155).

The number of sustainability initiatives available is increasing as is the number of universities engaging with sustainable development. Many universities however, have remained quite traditional (Lozano *et al.* 2011:8) which means that many of them are still lagging behind in

sustainability practices. An important factor influencing the effectiveness of sustainability initiatives in Higher Education Institutions (HEIs) is the level of information that is available to promote participation, cooperation and awareness. Since promotion of sustainability through environmental management initiatives with limited information may have negative consequences (Evangelinos *et al.* 2009:1155); it is important to ensure fluidity in the availability of information at all levels of the organisation.

Wright and Wilton (2012:118) argue that even if much is done to incorporate sustainability in higher education, it is uncommon to find a university that fully buys into the importance of sustainability. Since the application of sustainable development in some universities is still relatively new, it still faces some challenges (Wright 2010:61), also because of the complexity of universities (Waheed *et al.* 2011:721). Compared to the total number of universities in the world, the number of universities engaged with sustainable development is therefore still relatively low (Lozano *et al.* 2011:2).

Even though there is an increasing number of environmental protection measures in place, universities generally need a more systematic and sustainable approach in reducing negative impacts and making campuses more sustainable (Alshuwaikhat and Abubakar 2008:1777). A professional and efficient environmental management approach is also crucial for reducing resource use and the negative impacts of various campus operations. Unfortunately, this approach is generally lacking in most universities; thus attaining sustainability is not easy (Alshuwaikhat and Abubakar 2008:1778).

A framework to achieve sustainable campuses that could remedy the limitations of the current environmental management practices in universities was proposed. This would happen through the integration of three strategies: (a) the use of Environmental Management Systems (EMS), (b) public participation and social responsibility, and (c) by promoting sustainability in teaching and research (Alshuwaikhat and Abubakar 2008:1777). In a university context, sustainability is therefore a holistic duty between university management and its community to make the environment sustainable and to promote global sustainability for the benefit of all (Evangelinos *et al.* 2009:1160). This means that in universities sustainability will affect every sphere: from lecture rooms and laboratories, to housing, transportation, and other services in the entire institution (Alshuwaikhat and Abubakar 2008:1778). Even though universities have historically been responsive to societal needs, higher education still has areas of resistance with regard to sustainability practices in all

levels of the university (Stephens and Graham 2010; Wright and Wilton 2012:118). It therefore remains to be seen if Rhodes University with all its environmental policy initiatives and other efforts towards a sustainable university will be able to break this perception.

In contrast to the views expressed above, Evangelinos *et al.* (2009:1154) argue that Higher Education Institutions (HEIs) are considered to have contributed to the promotion of sustainability by demonstrating intellectual leadership with regard to the way in which a sustainable society can be achieved. Universities hold an exceptional position in society as they are able to create possibilities that promote and encourage societal responses to the sustainability challenges facing communities (Evangelinos *et al.* 2009:1154; Waheed *et al.* 2011:720). Universities should therefore promote patterns of development that would be compatible with a safe environment, increased biodiversity, ecological balance, and intergenerational equity.

The concept of a sustainable university is described as "higher education as a whole or in part that includes and supports minimisation of negative environmental, economic, societal and health effects generated by the use of resources in order to fulfil its functions of teaching, research, outreach, partnership, and stewardship, to help society make transition to a sustainable lifestyle" (Velazquez *et al.* 2006:812). There seems to be a common understanding in the literature that a sustainable university campus suggests a balance between economic, social and environmental goals in policy formulation as well as a long-term perspective about the consequences of campus activities (Newman 2006:633). If sustainability is to be a focus of the institution, it is necessary that all levels of stakeholders in a university work together (McMillin and Dyball 2009:55; Wright and Wilton 2012:118). For a particular university to take a leadership role in sustainability, it is important that all stakeholders within the institution have a similar understanding of the concept, including how vague and overarching the term can be (Wals and Jickling 2002; Wright and Wilton 2012:118). Therefore, working together with a common goal is vital to maintain a sustainable environment.

A sustainable university is also understood to be a healthy campus environment, achieving prosperity through energy and resource conservation, waste reduction and efficient environmental management, promoting equity and social justice in its affairs and exporting these values at a community, national and global level (Alshuwaikhat and Abubakar 2008:1778). The main objective of universities does not only include educating students,

preserving and advancing knowledge but also finding sustainable solutions for societal problems through research (Alshuwaikhat and Abubakar 2008:1778).

To some universities, a sustainable university simply means that they should have a master environmental plan, environmental guidelines or an environmental statement (Alshuwaikhat and Abubakar 2008:1778). Other universities believe that they can meet the challenge of sustainability through the signing of national or international declarations only. However, universities that take their environmental mandate seriously create individual institutional policies and employ a range of strategies aimed at demonstrating their commitment to this cause. These strategies can include ISO 14001, green building initiatives, environmental stewardship, Environmental Impact Assessment of projects, environmental protection, etc., as means of achieving campus sustainability (Alshuwaikhat and Abubakar 2008:1778).

According to Velazquez *et al.* (2006:812) key characteristics for a sustainable university are the promotion of transformative rather than transmissive education, enabling students to address complex challenges, emphasizing inter-and trans-disciplinary research and science, incorporating problem-solving skills in curricula, establishing networks that can influence the variety of expertise on campus to share resources efficiently and effectively, providing leadership and vision that promotes needed change and guides long-term transformation of the university that is responsive to the changing needs of a society.

2.4 Stewardship in universities

University management has a duty to ensure sustainable environments so that the university can serve as a centre for the promotion of global sustainability for the benefit of all (Alshuwaikhat and Abubakar 2008:1784). Since the university has to take a leadership role in sustainability, it is important that all stakeholders within the institution have a similar understanding of the concept (Wals and Jickling 2002:221; Wright and Wilton 2012:118).

Lozano *et al.* (2011:2) proposed that in order for universities to become sustainability leaders and change drivers, they need to ensure that the needs of present and future generations can be met, and that professionals are well versed in sustainable development to effectively educate students. They also need to assist with the transition to sustainable practices as indicated by the declarations, charters, partnerships and conferences. In doing so, university leaders and staff must be empowered to catalyse implementation (Lozano *et al.* 2011:2). It is therefore also the responsibility of university management and its community to make the

university environment sustainable so that the universities can serve as centres for the promotion of global sustainability for the benefit of all.

Furthermore, if universities are able to take a leadership role in sustainability, it is important that all participants within the institution have a similar understanding of the concept, including how vague and over-arching the term can be. Lozano *et al.* (2011:9) emphasised that universities and their leaders need to become more proactive in making sustainable development an integral part of their system, so that they can become leaders in creating new systems and phasing out the old ones. By doing this, societies could be helped to become more sustainable. It should be noted that this is a continuous process, which requires perseverance and dedication, both in the present, and with a long-term perspective. Lozano *et al.* (2011:3) proposed some initiatives that can be used to ensure sustainability in universities, including implementation of sustainable development through campus experiences, incorporation of sustainable development in the daily activities of the universities, empowerment of educators on the concepts of sustainable development, promote values, tools and procedures of sustainable development, and replicate and multiply the applications of the new sustainable development approaches throughout its curricula.

Universities have a social responsibility and moral obligation to ensure a sustainable environment. They have a critical role to play in creating a sustainable future as they educate many professionals who lead, manage, and teach in our society (Wright and Wilton 2012:118; Evangelinos *et al.* 2009:1160). They can therefore serve as sustainability innovators through research activities and as role models to communities depending on how they conduct their operations and activities. It is clearly indicated that universities have a significant contribution to the development of our society, particularly with regard to youth training and public awareness about sustainability (Alshuwaikhat and Abubakar 2008:1779). They can therefore be sustainability innovators through research activities, and act as models for communities depending on how they conduct their operations and activities.

2.5 Challenges that constrain sustainability

Reduced levels of information dissemination from senior administrative management to the rest of the university have been identified as one of the primary challenges to sustainability in universities. In addition, Lozano *et al.* (2011:3) indicated the following constraints which contribute to the resistance of universities in engaging sustainable development: lack of

awareness about sustainable development, insecurity of teachers and threats to academic credibility, over-crowded curricula, lack of support, views that sustainable development has little or no relevance in certain disciplines of study, and uncertainty regarding the effort required to incorporate sustainable development into curricula. Similarly, in Canadian universities lack of financial support and resources and resistance to change are perceived as the largest barriers towards sustainability initiatives (Wright and Wilton 2012:118,124; Evangelinos *et al.* 2009:1160; Smyth *et al.* 2010:1013).

Amutenya *et al.* (2009:238) however, argue that universities should not only be guided by financial arguments as their contribution to sustainable environmental practices could be through the development of society by training professionals and decision makers. Another major constraint that can delay the progress of sustainability in some institutions is a lack of interest on the part of the academic community (Evangelinos *et al.* 2009:1160); which could account for the low levels of participation from members of the academic community during the planning, application and implementation of environmental management projects.

Universities need to find ways for effective incorporation of sustainability concepts into policies, education, research, outreach, and campus operations of the university, and establishing a system that makes sustainable development an integral part of the university culture. This will create a multiplying effect within the institution and in society as a whole. It seems that some university leaders and faculty members worldwide are ignorant of sustainable development goals and principles, or if they are conscious of them, minimal effort seems to be made to incorporate them into their courses, curricula, research and outreach (Waheed *et al.* 2011:721).

In contrast to this, some universities promote sustainability on campus by re-thinking their missions and streamlining their research programmes and life styles on campus to improve their trans-disciplinary activities with other societal institutions (Waheed *et al.* 2011:720). Promotion of sustainability activities therefore becomes a priority.

2.6 Initiatives towards sustainability at Rhodes University

A number of initiatives towards enabling a sustainable environment has been implemented at Rhodes University. Following the signing of the Talloires Declaration, Rhodes University has developed an environmental policy, undertook a carbon emission audit, established a green fund, amongst other inititives.

2.6.1 Rhodes University as signatory to the Talloires Declaration

Rhodes University committed itself and signed the Talloires Declaration as part of the initiative towards sustainability (Amutenya *et al.* 2009:238; Timmermans & Lotz-Sisitka 2003). The declaration encourages universities to use available opportunities to raise awareness regarding the urgent need to move towards an environmentally sustainable future (Caddick *et al.* 2007:13, Amutenya *et al.* 2009:238, Lozano *et al.* 2011:4). As a signatory to the declaration, Rhodes University mandated itself to executing the aims of the declaration (Amutenya *et al.* 2009:238). Over the past few years, the university has made a number of commitments to work towards a sustainable future (Timmermans & Lotz-Sisitka 2003:1).

2.6.2 Rhodes University Environmental Policy

Following the signing of the Talloires Declaration in 1991, Rhodes University developed the Rhodes University Environmental Policy (RUEP) as it is required of signatories to develop plans that aim towards achieving and complying with its mandate (Timmermans & Lotz-Sisitka 2003). The existing environmental policy is to be revised every three years (Amutenya *et al.* 2009:238). The RUEP clearly states the university's goal towards achieving best environmental practices and sustainability (RUEP 1998). In terms of the RUEP, Rhodes University aims at improving the environmental components of curricula, and to provide opportunities for students to study local environmental issues (AEC 2009:2). The policy gives options towards achieving a sustainable learning environment, but does not mention compliance incentives (Caddick *et al.* 2007:15).

However, if an institution is tasked with a responsibility, the necessary resources for fulfilling this responsibility should be made available. (Caddick *et al.* 2007:14). In the case of Rhodes University, failure of the institution to designate a staff member to take care of environmental issues resulted in a weak implementation of the policy (Amutenya *et al.* 2009:238) as the lack of resources makes it impossible to accomplish a sustainable environment. The policy needs to be reworked in order to utilise the considerable university resources for best environmental practices (RUEP 1998).

Another indicator of successful implementation revolves around student awareness of environmental issues. According to AEC (2009:15) only 10 % of Rhodes students was aware of the RUEP. In this respect Rhodes University seems to have failed to comply with the Talloire Declaration (AEC 2009:20).

2.6.3 Carbon emission audit

Carbon footprint is a tool used to measure and quantify carbon emissions and other products (Gottlieb *et al.* 2012:193). In 2009 a group of Environmental Science students conducted an audit on the levels of carbon emissions caused by institutional operations and activities at Rhodes University (Leslie *et al.* 2009). The study investigated the levels of carbon emissions contributed by electricity, transport, waste, gas and paper to Rhodes University's carbon footprint and recommended mitigations for minimisation schemes (Leslie *et al.* 2009:1). While electricity was found to be the biggest contributor with high levels of carbon emissions, paper contributed just over two tonnes of carbon emission in 2008 at Rhodes University.

2.6.4 Green Fund

Launched in 2011, the Green Fund initiative had its genesis in the projects of the Environment Science students who, in 2009, calculated the university's carbon footprint and proposed ways to 'reduce carbon emissions and mitigate the impacts caused in the environment' (Rhodes University Green Fund website). It aims to motivate learning and practices in environmental sustainability to make Rhodes University and Grahamstown a model sustainable town in southern Africa (Rhodes University Green Fund 2012). The students proposed the formation of the Fund to support initiatives that could contribute towards the reduction of Rhodes University's carbon footprint and for the institution to become an environmentally friendly-institution (Rhodes University Green Fund 2012)

2.6.5 The Institutional Learning Management System

As reported earlier, one of the recommendations of the Amutenya *et al.* study (2009) was promoting the use of electronic media to replace printing of student handouts. Whether through the use of a learning management system or social media, Information and communication technology has a huge role to play in minimising paper usage in an academic institution.

In 2003 Rhodes University started using Moodle (moodle.org), an open-source learning management system in 2003. Although the implementation of RUconnected, as the learning management system was branded later, was not primarily aimed at addressing paper-usage at Rhodes, the reduction of paper-usage came as a welcome by-product. Instead of mass-printing of journal articles for students for example, students are provided with a link to the

electronic version of an article directly on the original research databases. Also, rather than requiring students submitting printed copies of their essays, many lecturers required their students to submit electronic copies onto RUconnected, some of who would also assess those essays online.

While initial uptake of the learning management system was relatively slow, by 2009 almost all undergraduate students have been using it to access course resources and about 80% of lecturers were using it to enhance their teaching and interaction with students (Mostert, 2009:3). In addition, RUconnected is being used by most residences, many sport clubs and cultural societies, as well as a number of administrative divisions to facilitate communication and share resources, thereby further minimising paper-usage on campus.

2.6.6 Critical Thought Website

In 2011, the Rhodes University Business School (RBS) pioneered the Critical Thought website (http://criticalthought.co.za/) and its associated social media campaign. This was aimed at creating an online platform for facilitating and promoting critical thought around responsible leadership, integrated social themes and for the social media to create a platform for dialogue, debate, understanding and knowledge (Rhodes 2012:37). The Rhodes Business School developed these initiatives as a commitment towards 'walking the talk' on the sustainability journey.

2.7 Change Management

Lozano *et al.* (2011:2) propose that universities become sustainability leaders and drivers of change to ensure that the needs of present and future generations are understood and addressed. In planning for change, it is important for management to take resistance into account as change can trigger varying emotional reactions. A lack of trust and misunderstanding, different perceptions about the costs and benefits of the proposed change, and unwillingness to change the status quo can all inhibit change processes. In addition, people often resist change because they fear they will not be able to develop the competencies necessary to perform well (Smit and Cronje 2003:223). Lozano et al. (2011:2) therefore also suggest that professionals who are well versed in sustainable development and are effective in educating students of 'all ages' help make the transition to 'sustainable societal patterns'.

2.8 Tools for sustainability

Several tools and concepts for measuring sustainability have been suggested over the years (Gottlieb *et al.* 2012:193). While carbon footprint was used as a tool to measure carbon emissions at Rhodes University, the ecological footprint has been one approach that has been receiving a lot of attention in the academic, policy and education spheres (Gottlieb *et al.* 2012:193). Counsell and Allwood (2007:340) recommended that removal of stages in the life cycle of office paper could reduce gas emissions per tonne between 1 % and 95 %, depending on the steps that are avoided. Evangelinos *et al.* (2009:1154) stated that an improvement of environmental management in HEIs can be achieved with well-organised environmental management systems (EMS).

Alshuwaikhat and Abubakar (2008:1780) however indicated that the above management tools cannot ensure sustainability if used individually as they each have their own weaknesses. To acknowledge the different dimensions and complexity of environmental problems requires a more proactive attitude and the development of integrated solutions. It then becomes a necessity to enhance awareness and facilitate the flow of information and adequate tools to use for sustainable paper usage in the broader sense of an institution.

2.9 Paper consumption and mitigations for reducing wastage

Due to South Africa being a semi-arid country with limited areas for forestry plantation expansion, consciousness about environmental issues has been increasing (Amutenya *et al.* 2009). Amon-Tran *et al.* (2012:527) identified paper as one of the factors that has an impact on the environment; they indicated that paper accounts between 60-80 % of total carbon emissions, depending on what it is made of and how it is manufactured. One of the major constraints for the reduction of paper consumption is the fact that most institutions still reject electronically submitted assignments and continue to request documents to be submitted in double-spaced, single-sided hard copies (Smyth *et al.* 2010:1013). Some of the strategies for addressing paper wastage are outlined below.

2.9.1 Recycling paper

To achieve higher paper recycling rates by replacing poorly labelled, unevenly distributed paper receptacles is another potential strategy towards increasing recycling participation. For example, at the University of Northern British Columbia (UNBC) paper recycling bins have outdated labels of acceptable items and have not been strategically positioned throughout the

campus (Smyth *et al.* 2010:1013). Studies have shown that providing a campus community with convenient opportunities to recycle, purchasing new, accessible recycling bins and effectively communicating how the recycling system operates, will result in higher rates of paper recycling (Amutenya *et al.* 2009:240; Smyth *et al.* 2010:1013).

Atherton and Giurco (2011:276) also proposed similar strategies towards paper reduction. This included minimisation of use, centralised purchase of paper, minimisation of virgin materials used and not using environmentally harmful substances in paper production, all of which would be aimed at promoting sustainable paper usage and improving data on its use and disposal.

2.9.2 Reducing paper usage to paperless

According to Amutenya *et al.* (2009:238) and Smyth *et al.* (2010:1013) institutions could develop policy that encourages double-sided printing which will reduce paper wastage. These authors also recommended financial and technical feasibility strategies for reducing paper consumption through information dissemination techniques such as education and awareness campaigns. Both studies suggest that the university should also invest in printers capable of printing on both sides of a sheet of paper. They also demonstrated the importance of providing the campus community with convenient recycling opportunities and effectively communicating how to utilise a recycling system which can result in increased rates of paper recycling (Amutenya *et al.* 2009:240; Smyth *et al.* 2010:1013). Recycling is a definite step towards waste reduction. However, the processing of materials for re-use still requires the use of energy, which means that recycling alone will not create an environmentally sustainable waste management programme (Smyth *et al.* 2010:1013).

Leslie *et al.* (2009:18) described similar factors and proposed mitigations that would reduce the amount of carbon emissions caused by paper usage. Counsell and Allwood (2007:350) suggested that cutting out paper altogether and replacing it with an electronic equivalent, would reduce climate change gas emissions by 85%. For example, Heil (2009), former assistant principal of Edinburgh's Telford College, indicated that "people hang onto paperwork from meetings and things when they really don't need to. Everything is available online; keeping paper copies is a thing of the past". The importance of promoting the use of electronic media as an alternative to paper usage was indicated (Leslie *et al.* 2009:21). Electronic media includes devices such as e-mail, instant messaging (IM), smartphone

communication, social-networking sites (SNSs), videos or online games, and television or movie viewing (Wade *et al.* 2011:275).

According to Czernierwicz *et al.* (2006:7), South Africa has increased its interest in technology in many higher education institutions and that since 2000 institutions are spending more of their budgets on Information and Communication Technology (ICT) infrastructure. According to Leslie *et al.* (2009:21) it would be essential to have a policy that would require all university documents to be paperless where possible or printed on both sides, as was in instituted at UNBC (Smyth *et al.* 2010:1013). There are a number of systems that can be used in universities to promote a paperless environment such as the use of Electronic Document Management Systems, although its implementation does not come without criticism. In a case study by Winterberg (2011:38), for a financial consulting firm, it was found that misconceptions that cause people to resist the use of electronic media include the adequacy or inadequacy of a servers' file storage capacity. Many firms scan paper documents to Adobe PDF files and save them in a complex hierarchy of folders on a server. This is however often a long and tedious process and little is done to convey the specific content of a document. The use of document management software eliminates most of these drawbacks and it is advisable to use it as an effective work-flow process as such software applications categorize each document using profiles or templates.

Another advantage of using document management software is that it mitigates the risk associated with physical files being lost due to unforeseen disasters. Document management software allows planners to store all electronic documents onto one central server which can be backed up onto multiple physical locations and mirrored on a backup server to minimize interruptions to business continuity. In addition, restrict access permissions to documents, folders, and virtual file cabinets provides for an extremely secure environment (Winterberg 2011:39). Even though document management software is expensive Winterberg (2011:39) argues that the costs of operating a business without an Electronic Document Management System (EDMS) in place are equally expensive.

2.9.3 Social media (such as Facebook and Twitter)

In recent years, there has been a rapid growth in the use of social networking tools (e.g. Facebook) and social media for general, social, recreational, and entertainment purposes. For the purpose of this study, social media is defined as "online web communities (either online or mobile) that allow users to connect and share information with a self-selected network of

colleagues or friends" (Humphrey and Laverie 2011:46). According to Poellhuber and Anderson (2011:104), many educators believe that these tools offer new educational affordances and avenues for students to interact with each other and with their teachers or tutors. In the case of Rhodes University, this tool can be used for the purpose of advertising student social events and other activities, rather than using paper posters.

As in the case of using electronic files, social media is also criticised. De Abreu (2010:27) mentioned that most educators and parents take the approach of being protectionists and have a fear of the unknown in these socialized environments. This is due to their limited knowledge of many of the tools of social media or because they are not as frequent users as students. According to De Abreu (2010:27), advocating to staff and students is required in order to gain the support of social sites with the idea of having an open relationship with students on these platforms. The only way to empower students is to also feel empowered as an educator; in order for that to happen, commitment and openness from the academic staff and administrators of the institution is needed.

2.10 Strategies for implementation

According to Armijo *et al.* (2003) educated future leaders, entrepreneurs and decision makers are prepared by universities to play a significant role in communicating the value of environmental sustainability to a wide variety of audiences. This may include training and awareness programmes to the broader community, and also ensuring that all levels of stakeholders are involved (Alshuwaikhat and Abubakar 2008:1783).

Cooperation between students is defined in terms of cooperative or collaborative which always assumes common objectives, interdependence, peer interaction, and information sharing (Poellhuber and Anderson 2011:104). This means that information should be provided through various means regarding the functioning of the university, the operation of environmental initiatives and alternative means of participation of members of the academic community. This is also to promote integration and ensure engagement of the institutional leaders in promoting sustainable development and by empowering and rewarding active champions to catalyse the multiplier effects for sustainable development throughout the faculty, students, staff and the broader society (Lozano *et al.* 2011:3). Through such improvements, an increase in environmental awareness may be achieved by co-operation and participation towards a sustainable environment.

In addition, Alshuwaikhat and Abubakar (2008:1784) highlighted the importance of challenging the university community to re-think and re-construct their environmental policies and practices in order to contribute to sustainable development at local, national and international levels. Thus, university management should make campus sustainability the foundation for campus operations, research, and teaching and strive to conserve natural resources and support their sustainable use through conducting affairs in a manner that safeguards the environmental health and safety of the university community. Policy endorsement is crucial in order for people to comply, while setting the norm for campus-wide participation in all its activities (Amutenya *et al.* 2009). In the case of UNBC, coupling a formal policy with resource reduction education and awareness measures became more instrumental in recycling (Smyth *et al.* 2010:1013).

2.11 Research Questions

The objectives of the study are to investigate the conditions that promote or prevent sustainable paper usage and to explore the attitudes and perceptions of staff and students at Rhodes University in this regard.

In order to fulfil this purpose, the following research questions were explored:

1. How did Rhodes University respond to the recommendations regarding sustainable paper usage in the two earlier reports (Leslie *et al.* 2009:18; Amutenya *et al.* 2009:241)?

    a. Which of the recommendations have been implemented?

    b. To what extent were these implemented responses successful in promoting sustainable paper usage or not?

2. What conditions enable or constrain sustainable paper usage at Rhodes University?

    a. Which structures enable or constrain sustainable paper usage?

    b. How has the culture influenced the initiatives towards sustainable usage of paper?

    c. How do agents promote or inhibit sustainable paper usage?

3. How would Rhodes University respond to the proposed digital interventions for academics, administrators and student activities?

The above questions were asked to an identified sample able to influence change at Rhodes University in order to evaluate their attitudes and perceptions on the conditions that promote or prevent sustainable paper usage in teaching, learning and other activities. Once the above questions were addressed, further recommendations were made to encourage conditions that promote sustainable paper usage in teaching, learning and other activities. This was also to discourage conditions that constrain sustainable implementation, but promote enablers of sustainable paper usage at Rhodes University.

Section 3. Research Design

3.1 Description of research methodology

This section firstly focusses on the methods and tools used to evaluate the institutional response to the mitigations and recommendations that were made by earlier studies at Rhodes University (Leslie *et al.* 2009:18; Amutenya *et al.* 2009:241). Secondly, it investigates the conditions that promote or constrain sustainable paper usage in teaching, learning and other activities by exploring the perceptions and attitudes of staff and students towards sustainable paper usage. Thirdly it assesses sustainable development and the perception of participants towards the proposed possible strategies that can be used for further minimisation of paper usage towards a paperless institution. The research design consists of a triangulation of tools used to obtain a better understanding of the perception and attitudes of academics, administrators and students through observations, interviews and online questionnaire surveys. Data analysis is mainly qualitative.

3.2 Objectives of the study

The objectives of the study are to investigate the conditions that promote or prevent sustainable practices of paper usage and the attitudes and perceptions of staff and students at Rhodes University towards this. In order to fulfil this purpose, the researcher was guided by research questions as indicated in section 2.13.

This study emerged from the evaluation of the two earlier studies by Leslie *et al.* 2009 and Amutenya *et al.* 2009, as there were indications of implementation in some of the mitigations that were recommended. Both studies indicated some common mitigations, particularly on recycling, paper re-use and the promotion of the use of electronic systems. This study then investigated the perceptions and attitudes at Rhodes University staff and students on introducing and re-enforcing the use of digital systems for academic use in teaching, learning and other activities.

3.3 Research Paradigm

This study was conducted within the interpretive paradigm (Mniki 2006:21; Gunzo 2010:32). An interpretative paradigm is defined as a general perspective world view and a way of breaking down the real world based on human experiences (Patton 1990:479). Similarly, Mniki (2006:21) indicated interpretive research as that which seeks to interpret the subjective

meanings held by people in their conception of reality; hence, understanding and interpretation of human actions are central to the interpretative paradigm. Therefore, this approach was relevant to this study because it evaluated how staff and students responded to the interventions of reducing paper usage. It also set out to understand the perceptions and attitudes of staff and students regarding minimisation of paper usage in teaching, learning and other activities.

3.4 Research Methodology

The research methodology adopted was a case study method, because only Rhodes University staff and students were used to conduct an in-depth investigation of the problem statement. Creswell (1998) defines a case study as an in-depth exploration of a particular context, such as a classroom or a group of individuals that involves the collection of extensive qualitative data. This study was based on the life experiences of staff and students and their response to the mitigations recommended towards minimisation of paper usage; it also looked into the conditions that prevented the implementation of this or promoted it, which also depended on the respondents' perceptions and attitudes.

Rhodes University was identified for the study because of its environmental commitments and the initiatives that are in place to ensure its environmental sustainability. For example, the two earlier studies (Leslie *et al.* 2009:18; Amutenya *et al.* 2009:241) were among the work done for the recommendations of a sustainable university. The university is located in Grahamstown, in the Eastern Cape province of South Africa; it is relatively small and had about 7216 registered students in 2011 (Rhodes University Digest of Statistics 2011).

3.5 Research Method

A mixed method was used, both qualitative and quantitative (Gunzo 2010:33). The mixed approach was used to acquire a holistic, in-depth and meaningful understanding of a real life event (Yin 2003:2). Mniki (2006:23) also suggests this method for obtaining a comprehensive perspective of the data from multiple sources of information in order to provide an opportunity for validation and cross-checking of the findings.

3.5.1 Qualitative

The qualitative approach is one of the methods used in this study; it was used in order to explore the natural settings of real social factors and focus on the processes rather than the

outcome of the research. In qualitative research, data is compiled from the descriptions of how the world is viewed by the research respondents (Gunzo 2010:34). According to Du Plooy (2001:49) this method seeks to study human actions with the aim of describing them "as accurately as possible" and understanding rather than explaining and predicting human behaviour. Therefore, the aims of qualitative researchers are to gain in-depth descriptions and understanding of actions in terms of their specific, natural context, rather than attempting to generalize to some theoretical populations (Denzin & Lincoln, 2000).

This study looked at how the staff and students of Rhodes University responded to mitigations about minimisation of paper usage, and also assessed their reaction to promoting digital systems instead of paper usage.

3.5.2 Quantitative

For the quantitative approach, an online questionnaire was conducted with the entire population of the current environmental student representatives on house committees in residences. Rhodes University has 52 residences on campus and each has an environmental representative. The researcher used an institutional mailing list to contact all environmental representatives to forward them the questionnaire. In the absence of a readily available contact list of the 43 administrative staff of academic departments, the researcher used the Rhodes University website to search for the e-mail addresses of all office administrators of academic departments.

Gunzo (2010:33) mentions that quantitative research relies mostly on numerical values and statistical analyses. Questionnaires were compiled based on the literature and were made available to participants using e-mail with a link that connects them to Google Drive (Appendix C). The questionnaire was useful in compiling information from student and office administrators' practices around paper usage, conditions that prevent and those that promote minimisation of paper usage and their perceptions and attitudes. The reasons that I did not use only this research method are embedded in the ways it differs from qualitative research and that it has made it easier to access information from a big sample.

3.6 Data Collection

Multiple sources of data were used to get an in-depth perspective of the conditions at Rhodes University. This was to validate the reliability of the findings (Merriam 1998:198). The following techniques were used to generate data:

3.6.1 Sampling method

This study used purposive sampling for data collection. Participants were identified based on their strategic role as a member of staff or a student at Rhodes University. The sampling is consistent with the overall purpose of the research (Banda 2009:49). As opposed to probability sampling, purposive sampling is centred on the idea that it is sometimes appropriate to select a sample on the basis of the population knowledge, its elements and the nature of the research investigation (Babbie and Mouton 2007:166). A purposive sampling method was used to conduct interviews which consisted of the following: the SRC Environmental councillor, the Support Manager: IT Division, the Safety, Health and Environment Officer, an Associate Professor: Environmental Science, and the Chair of the Environmental Committee.

Three data collection methods were used: interviews, online surveys and observations.

3.6.1.1 Interviews

Takalani (2008:10) defines an interview as a data collection encounter whereby one person asks questions and the other person responds. There are different forms used to conduct interviews (Gunzo 2010:36). Face-to-face interviews were conducted in this study. Interviews are used because they provide an opportunity for communication with the respondents on people's experiences (Gunzo 2010:36).

Face-to-face semi-structured interviews were used as these allowed the researcher to take note of facial and/or body expressions during the interviews (Mniki 2006:24). These were a guide in obtaining greater clarity and understanding of the explanations – for example, the use of gestures, facial and/or body expressions were a hint for the researcher to pick up when the interviewee did not understand a question. The interviews focused on people that could influence decision making within the institutional structures at Rhodes University. All interviews were conducted in the offices of the respondents. This was achieved by allowing

respondents to choose the venue that they were comfortable in (Gunzo 2010:42). Respondents also suggested the date and time for the interviews.

Each participant was contacted in a personalised e-mail and participants were given a week to respond (Wright and Wilton 2012:119). A follow-up telephone call was conducted with one of the participants who had not responded to the request at the expected time and the participant appreciated the reminder as the person had forgotten to confirm and agreed to participate. A total of ten participants were requested to participate in the study, only five of whoem agreed to be interviewed. Informed by the literature, different interview schedules questions were designed according to each participant's role and knowledge around paper usage at Rhodes University. These interview schedules (Appendix B.1 to B.6) were emailed to the participants prior the interviews.

At the start of the interviews, participants were briefed about the research purpose (Terre Blanche *et al.* 2006:299). Participants were also informed of their rights to withdraw from the research prior to submission of this dissertation. Each participant was interviewed once in a face-to-face setting at a scheduled time in the offices of the participants. All questions were open ended and follow-up questions were made in some areas for clarity; probing was used for clarification and understanding of the data collected (Gunzo 2010:36). All the interviews lasted about 30 - 45 minutes; were audio-recorded with the permission of the participant and transcribed. Each respondent was interviewed once (Wright 2010:62).

Some of the interviewees suggested that the following individuals also be interviewed due to their expertise in the subject matter investigated in this study: an Associate Professor in Economic and Economics History, a Professor of Environmental Science and the Manager: Printing Service Unit. Due to time constraints these participants were sent a set of questions to respond to via e-mail. However, none of those individuals were available or willing to respond to the questions that were e-mailed. Although some interviews were done through email due to time constraints and work commitments of the interviewer, the majority of the interviews were conducted in face-to-face settings (Wright 2010:62).

Interviews were suitable for this type of study as they gave the researcher an opportunity to interact with the participants in the study (Takalani 2008:10). However, online surveys wre conducted alongside the in-depth interviews in order to provide multiple perspectives on the area of investigation..

3.6.1.2 Online surveys

Online questionnaires were compiled using Google Drive. Questionnaires are popular due to the fact that they are "ideal for collecting data from a large population" (Muijs, 2004:44). In the investigation of the perceptions and attitudes of students, a link to the questionnaire was distributed to the environmental representative sample (Evangelinos *et al.* 2009:1157). The environmental representatives were selected on the belief that they represent the bigger student population, particularly on environmental issues at the residences. Personalised e-mails with a link to the questionnaire were also sent to 43 office administrators in various academic departments.

Questionnaires are widely used for collecting data, including survey information and organised numerical data. They are also a convenient research tool since "it can be administered and is usually easy to analyse" (Gunzo 2010:42). Questionnaires were self-administered. The construction of the questionnaire was based on the common mitigations that were recommended by the two earlier studies mentioned above, and was also in line with the constraints identified in the literature. The questionnaire contained both closed and open-ended questions and was divided into three sections.

A cell phone airtime recharge voucher to the value of R30 was offered as an incentive to every 5th student respondent, to encourage participation. Participants were given five to eight days to respond to the questionnaires available on Google Drive (Appendix C). The programme enabled the student responses to be reflected immediately to the researcher for data analysis. However, due to limited responses from the environmental representatives, the incentive was not issued.

3.6.1.3 Observation

Observation was also applied as a data collection method in this study for management of issues such as potential deception during interviews (Creswell 1998:125). The observation enabled the researcher to identify certain behaviours during interviews, in that the researcher was able to note expressions to determine the attitudes and perceptions of interviewees. The researcher also conducted some observations around campus and photographs relevant to the study were captured (Section 4). The researcher was a complete observer as her role was hidden (Takalani 2008:12).

3.7 Data analysis

Takalani (2008:13) define data analysis as the process of making sense of the data collected and for the researcher to consolidate, reduce and interpret responses. Data analysis started at the beginning of the study with the review of the mitigations recommended in the two earlier studies (Leslie *et al.* 2009:18; Amutenya *et al.* 2009:241). According to Gunzo (2010:55), a literature review gives direction to the rest of the study as it provides preliminary analysis. The data collected was analysed from the two data sources and involved an attempt to construct meaning, themes and patterns from interview transcripts and responses from questionnaires. Data from these sources was organized into categories as in the interview schedule and questionnaire structure in order to interpret areas that are common and have similarities or contrasting views.

A qualitative data analysis is described as a continuous iterative enterprise of selecting, focusing, simplifying, abstracting and integrating the data (Takalani 2008:13). Data analysis occurs as an explicit step in practically interpreting the data set using specific analytic strategies to transform the raw data into a new and sound description of the research (Takalani 2008:13). This study made use of two strategies for qualitative analysis, i.e. categorizing strategies (thematic analysis) and narrative analysis of connecting similarities or contrasting views from the correspondences (Gunzo 2010:56). The interview data was categorised and sorted into themes (Terre Blanche *et al.* 2006:323; Wright 2010:63). The themes were derived from the research questions that were prepared for the interviews and the responses provided (Terre Blanche *et al.* 2006:323); that is, interview responses were organised into categories and themes in line with the structured questions used for the interviews. The analysis of the interviews took place immediately after all of the interviews were completed.

The data from the questionnaires on Google Drive was transferred to a Word document. The responses of the administration staff were categorised, summarised and analysed using the chi-square test and the findings were not significant. According to Black (2008:488), both the chi-square test of independence and the chi-square goodness-of-fit test require that expected values be greater than or equal to 5. Since the sample was small and all the expected values were less than 5, the researcher then decided to record the results using percentages and frequencies. Since the sample from the environmental representatives was too small to do any meaningful analysis, the data was discarded (Terre Blanche *et al.* 2006:212).

3.8 Ethical issues

According to Takalani (2008:17), ethical dilemmas are a common challenge in the collection of data in qualitative studies; therefore, ethical issues were considered in this study. Before embarking on this study, the researcher requested permission (Appendix A) from the Registrar to conduct the study at Rhodes University, which was granted. Thereafter, an email requesting an interview was sent to participants in order to gain their consent, and to schedule for interviews. Obtaining permission from the participants was beneficial as the researcher learnt some information about them prior the interviews. Participants were informed about the terms of reference of the study (as indicated in the introductory statement of the interview schedules – Appendix B). The researcher ensured that time schedules and other specifications were adhered to. For instance, the participants were assured that their names or the institution that they are studying through will not appear anywhere in the report. To prevent any ethical dilemmas emerging in this study, the researcher explained to the participants what the study was all about and its purpose. The participants gave verbal consent before the interview was conducted, but were offered the opportunity to withdraw their consent before the submission of the thesis if they so wished.

It was important to consider issues of confidentiality and the use of information for the purpose for which it was intended. It was also agreed that the feedback from interviews be documented in terms of the interviewee's roles and functions at Rhodes University. A venue that suited respondents was agreed on by each of the interviewees and permission to record the interview was granted. The interviews were conducted with the utmost respect and the participants' needs and interests were taken into consideration. Ethics had to also be observed in the analysis of the questionnaire data.

3.9   Trustworthiness of the study

For the researcher to ensure validity and reliability of the research, it was required that all investigations be conducted in an ethical manner (Takalani 2008:15). In this case, the triangulation method was used to validate the trustworthiness of the study (Merriam 2009:270). According to Gunzo (2010:63), triangulation reduces the risk of the systematic prejudices or limitations of a specific method. In both the interview questions and the online questionnaires, a pilot was conducted. The pilot interview was conducted with the SRC environmental councillor to access the validity of the structured questions in responding to the problem statement. For the questionnaires, a pilot questionnaire was sent via e-mail to

individuals outside of the focus sample in order to ensure that the link in the email message was accessible and to make sure that the questions made sense to other people. All the data derived from the interviews and questionnaires were used to validate interpretations of the study. However, there was limited data received from the questionnaires; the response from the students was too small to warrant any meaningful analysis.

3.10 Challenges and limitations of the study

There were a number of challenges during preparation and data collection; one of which was the compilation of relevant questions to access meaningful data when responding to the problem statement. Poor responses from the identified participants were another challenge as well as availability of some of the academic staff, environmental student representatives and the departmental office administrators at Rhodes University. In addition, there were time constraints to put all the logistics together beforehand. The researcher also experienced some challenges at first when learning to work in Google Drive and when using it as a tool for the study. The interview schedule link e-mailed to interviewees had to be re-sent as an attachment on a Word document as some could not access the link to Google Drive. Finally, transcribing the interviews was time-consuming; a 30 minute interview took about 4 hours to transcribe.

Developing a questionnaire was the biggest challenge as it took longer to construct than initially anticipated. Conducting data collection in an academic institution during the end of the year period meant students prioritised their studies as is evident by the outgoing environmental representation sample not responding to the questionnaire. The administration staffs' responses were also not as anticipated, as two reminders had to be sent to urge them for their feedback.

Another challenge was streamlining the questions that I was going to ask without being biased and leading and coming up with follow-up questions when there was ambiguity. Time was another problem as setting up appointments with professionals who worked or had other commitments was a challenge. I would emphasize that it is important to ensure that there is more than enough time to make appointments and put all the logistics in place beforehand for data collection. Geographical distance was also a challenge as the researcher was based outside of Grahamstown.

The dependency on human interaction was a further challenge as this required a lot of understanding and patience by both the respondents and the researcher. Another challenge was the use of online request to invite participation. Since people screen emails and only engage in what is of importance to them and since as many view online surveys as a waste of time, people are generally not keen to participate in online surveys. As a result data did not come in a simple straight-forward manner, especially with regards the online questionnaires, despite reminders.

3.11 Conclusion

This section described the research objectives, research design, methods of data collection, and the challenges and limitations experienced in this study. The reliability of the data, validity of the instruments as well as ethical issues were also discussed. The following section discusses the results from the study.

Section 4. Results

The findings of the study are presented in two parts: the response from interviews, and the feedback from the online questionnaires. As reported in the previous section, the data collection process had its challenges, such that the findings of the interviews are from the five (N=5) interviewees that agreed to participate in the study, out of ten that were approached.

For the online questionnaires, the response is from the eleven (N=11) out of 43 office administrators that completed the questionnaire. The response received from the student environmental representation was small and it was impossible to do any analysis.

4.1 Interviews

The interviews were conducted with a student representative (SRC Environmental councillor), academic staff (Chairperson of the Environmental Committee, and an Associate Professor: Environmental Science) and the support staff (Support Manager: IT Division and the Safety, Health and Environment Officer). Some of the interview questions that were asked during the interviews were unique, based on the interviewees' experiences and responsibilities at Rhodes University. The responses were categorised into themes (highlighted in bold and italics) in an attempt to provide answers to the key questions of the study.

4.1.1 The SRC Environmental councillor

The interviewee was identified due to her valuable insight, experience and involvement in environmental issues at Rhodes University. Her response to the questions of the ***University's policies and its practices*** alluded to the importance of having an environmental policy at Rhodes University and that all environmental activities should be guided by this policy. The interviewee suggested that to fast track the implementation processes of policies, incentives have to be in place to promote compliance. She gave examples in that there could be bonuses for faculties that use less paper or that recycle paper or reward students that return their hand-outs to the respective departments at the end of the year for re-use. Therefore, having incentives and policies was identified as playing a significant role in reducing paper usage.

On the ***general awareness of the student body*** towards issues related to sustainable paper usage, the SRC councillor indicated that the awareness of students was limited, although this

is not fully comprehended. The alertness of students in paper usage when printing was also influenced by the cost saving aspect. In addition, Rhodes University green posters in the computer laboratories also played a significant role in making students aware of minimising the amount of paper used. The SRC councillor also raised her concerns regarding the use of paper posters to advertise social events around campus. This was seen as an ineffective way of sharing information, as students would walk pass them (Figure 4.1).

Figure 4.1   Poster advertisements on campus

In terms of the *academic staff awareness* around issues related to sustainable paper usage, the SRC councillor indicated that there is an element of awareness, even though others would ignore the importance of this. In that case she indicated that it is not easy to generalise their understanding as paper is still used a lot by academic staff on campus. For instance, she said "it is hard to say that everyone is printing on double sided paper as stand-alone (desk top) printers that are not connected to the network are still in use". The interviewee also mentioned that as long as the academic staff still require students to submit assignments in hard copy, it makes it impossible to measure the level of awareness such that in certain departments it is considered unprofessional to print assignments on double sided paper and would even mark a student down for that. Others allow students to submit their work electronically, together with hard copies. However, there has been a shift towards online teaching and learning at Rhodes; the use of RUconnected as a tool for teaching and learning has been effective, although some departments use it more than others.

Concerning the *general awareness of administrative staff*, the SRC councillor felt that they are still behind in terms of utilising the electronic document management system (EDMS), as most departments promote printed documents instead of making them available online. As a

result paper usage is still high, particularly for the printing of agenda's and minutes of meetings by administrative staff. She suggested that these could be sent electronically to participants of the meetings for them to access the documents electronically instead of printing piles of paper. In that respect, the interviewee also mentioned that the environmental committee made a decision to have paperless meetings.

The interviewee said that there are not many *initiatives* undertaken towards the reduction of paper usage at Rhodes University, except for the recycling programmes that are also not operating efficiently. Lack of awareness appeared to be the main cause of the inefficiency of the recycling initiative. An example given was the inability to separate recyclables from non-recyclables. She then suggested that the University of Cape Town (UCT) model of having coloured recycling wheelie bins around campus was something that could be adopted at Rhodes University; however this is a costly exercise and there are no funds available to acquire them at this stage. She also mentioned that there is a need to revitalise the recycling set-up, in order to make it more accessible to all.

As one of the *initiatives* to reduce paper usage, the interviewee has been involved in training the environmental representatives and house committee members at the beginning of every year to educate them on environmental issues around campus. She mentioned that she was also part of the programme of putting up posters that were to inform and promote the use of double sided printers in the computer laboratories.

The SRC councillor acknowledged that the University has *responded to the recommendations* made by the two earlier studies (Leslie *et al.* 2009; Amutenya *et al.* 2009), in that double-sided printing is practiced, although it is not fully implemented. Again, she appreciated the availability of RUconnected, as course hand-outs are no longer made available as in the past and if they are, they are printed on double-sided paper; she mentioned that printing on double sided paper should be regulated in order to ensure compliance.

In response to the question on the *constraining factors* that prevent the institution's ability to promote sustainable paper usage, the SRC councillor emphasised the lack of proper training on how paper should be recycled, such that people end up mixing recyclables with non-recyclables; again, there are not enough recycling bins. For example, at some stage the University was putting all rubbish in clear bags and that meant the recyclables were contaminated by non-recyclables and that caused a huge problem for the University. She then

suggested that funding to source the coloured recycling bins was an issue, as they are expensive (Figure 4.2). An additional constraint mentioned was that the double-sided printers do not always work efficiently in the computer laboratories.

Figure 4.2   Coloured recycling bins

The interviewee mentioned the ***enabling factors*** that could enhance sustainable paper usage at Rhodes University such as the Green Fund and other sponsors as potential funders for the sourcing of the proposed recycling wheelie bins. She suggested that there be more awareness and training on the aspects of reducing paper use, to ensure the sustainability thereof. Furthermore, she stated that in addition to awareness and commitment, there should be regulations, rules or policies in place; perhaps that would encourage people to first reduce, then re-use and then recycle. As an example, she suggested that in order to prevent the mixing of recyclables with non- recyclables, the non-recyclable bins should be left open and the bins for recyclables should be closed at all times to avoid contamination. Another enabler suggested was the use of e-mail as a tool of communication.

4.1.2 The Support Manager: IT Division

The involvement of the Support Manager: IT Division in the study was due to her day-to-day functions at the University and the initiatives that were promoted by the IT Division towards minimisation of paper usage. Her involvement in the extensive work to promote the use of double-sided printers at the library, computer laboratories and other common areas around campus, was important.

In terms of the ***University's policies and practices,*** the interviewee expressed her frustration in that an initiative to enforce a double-sided printing policy was turned down. She then

emphasised the importance of having the support for any initiative at senior management level to ensure monitoring and compliance. Among other reasons mentioned for not having the support to have a policy for double-sided printing is because of the "academic freedom" of those who are not in support of enforcing double-sided printing.

The Support Manager's *perceptions of the general awareness* of the student body, academic staff and administrative staff about issues related to sustainable paper usage were as follows: regarding students, she felt that they are well aware and are active in implementing paper reduction. She said students support paper reduction due to cost implications, as they pay (38 cents) to print on a single page of virgin paper. The same applies in residences and in the common computer laboratories, where students are willing to reduce paper usage as they mostly print on double-sided printers and also have a choice of either printing on re-used paper and pay less (3c), or on a normal paper that costs more.

In general, the interviewee felt that academic staff do contribute to excess paper usage, in that they require students to submit their work in hard copy instead of encouraging documents that are submitted electronically. As a result there is still a large usage of paper for assignments, reports and written tests.

In terms of the administration at Rhodes University, particularly in Human Resources (HR), Rhodes University strives towards a paperless administration process. As far as HR is concerned, a lot of the application and the interview processes have been provided on PDF and people access them from their computers and other electronic tools. The printing of minutes and agenda's for staff meetings has been reduced and the documents for meetings are now made available electronically for staff to access from their laptops. According to the Support Manager: IT Division, paper use has reduced in some of the committee meetings at the University, as the printing of documents is coming to an end.

In response to the question on the *initiatives* that are in place to promote sustainable paper usage, it was mentioned that certain operations at Rhodes University are moving more towards electronic usage. The Support Manager identified the following initiatives that are implemented at Rhodes University to promote sustainable paper usage and the success thereof. She stated that documents were initially printed on single paper, thereafter double-sided printers were used and now being introduced is the implementation of multi-function devices (MFD'S) that are network connected. The intension now is to promote the multi-

function printers instead of having contracts for four separate machines, one for printing, faxing, photocopying and scanning separately; this will save paper, protect the environment and be cost effective for the University. The interviewee indicated that the IT Division will be installing the multi-function printers at Jacaranda computer laboratory, the library and other areas that are in their control in order to monitor the progress and success thereof, at the beginning of 2013. Other initiatives that were promoted included recycling programmes; however, she admitted that she is not aware of the conduct of every department in terms of paper recycling.

The Support Manager's perception on the ***response to the mitigations*** recommended by the two earlier studies (Leslie *et al.* 2009; Amutenya *et al.* 2009), was that people responded well to the use of double-sided printing, although the effectiveness of other mitigations were not visible enough. She indicated that one-sided printers have been gradually replaced by the double-sided printing and that "technology has now shifted to multi-function printers, which promote a paperless environment." She also highlighted the fact that these things take time to achieve effectiveness.

The major ***constraints*** that were identified by the Support Manager included people as major contributors towards resistance to change, in that academic staff were perceived as the most reluctant in accepting the use of MFD'S at Rhodes University; that is, some departments resisted the use of the MFD initiative. She said it has not been easy to incorporate these practices into a policy to ensure compliance, as there is no advocacy at the policy decision level. She also mentioned that staff were under the impression that these machines were costly, that they jam frequently, require high maintenance, cause delays and result in exposure of confidential documents as they are shared by others. With regard to confidentiality issues of academic documents access personal codes have been introduced to be used for releasing individual printing jobs on the MFD; however there has still been no support. According to the interviewee all these reservations were either driven by ego, by the status of having personal printers in their offices, laziness and lack of willingness to change to the more advanced technologies. As a result of the reluctance from academic staff, there are a number of stand-alone (desk top) printers that are still available in individual offices and that was witnessed by the researcher during the interviews for this study.

The suggested ***enabler*** to enhance sustainable paper usage was to ensure all the necessary advanced technology and resources are available to ensure effective implementation.

In terms of **_digital interventions_** the interviewee promoted the use of e-mail as a preferred option for communication. She also indicated that it is important for users to understand that digital interventions are to improve the University workflow systems. However, the interviewee did not believe that the use of social media could be a viable alternative to advertise students' social events on campus and she suggested electronic notice boards.

4.1.3 The Safety, Health and Environment Officer

The interviewee's response to the general **_awareness_** on the issues related to sustainable paper usage at Rhodes University was that it is a "mixed bag"; she explained that some people are knowledgeable about sustainable paper usage, whilst others are oblivious.

The SHE officer is involved in the **_initiatives_** that promote the message for general environmental awareness of sustainable use of resources, including paper. The one initiative that was highlighted was the paper recycling boxes that are promoted to various departments.

In her response to the questions about the mitigations recommended by the two earlier studies (Leslie _et al._ 2009; Amutenya _et al._ 2009), the interviewee stated that these studies had promoted more paper recycling participation than there used to be. According to the SHE officer there are still too few paper re-use initiatives available. She highlighted double-sided printing as one of the well promoted mitigation measures, though there are certain individuals that continue to print one-sided. She also suggested that there should be a formal directive from the University management regarding paper usage, as people do what is most convenient for them.

The interviewee found the lack of formal directives from the University management a **_constraint_** that has resulted in less commitment and cooperation from the staff and students. She stated "if it were the Vice Chancellor (VC) or the Dean or anyone at senior management instructing managers and heads of departments to ensure that staff and students comply. I think the mitigations recommended would have been a lot more effective". Therefore, the application of the mitigation recommendations have probably been less widely implemented than one would have liked simply because the message has not come from the top. Further constraints indicated were the need for more financial support to ensure the sustainability of all environmental initiatives, the use of stand-alone (desk top) printers and ignorance around how to change the default settings to double-sided in printers.

According to the SHE officer, in order to *enable* staff and students to comply with sustainable paper use there has to be better infrastructure in place; an example given was the sourcing of recycling bins that are available around campus. Most importantly for the interviewee was to promote awareness programmes to enable everyone to participate towards achieving a sustainable University.

The interviewee's ***response to digital interventions*** at Rhodes University included providing electronic documents for meetings; to this effect the environmental committee has also made a ruling that their meetings be paperless. Unfortunately, not all committees practise the electronic document system which results in enormous amounts of paper wastage. Nonetheless, the interviewee indicated that there is potential for digital solutions at Rhodes University, but that the institution has to ensure that its back-up systems are good in the event of power failures or any other unforeseen circumstances.

4.1.4 Associate Professor: Environmental Science

The interviewee was identified due to his role in the Environmental Science Department; his contribution to environmental management initiatives as chairperson in the Interdisciplinary Science in Land and Natural Resource Use for Sustainable Livelihoods, and also as a co-author in the Amutenya *et al.* (2009) study.

In response to the request to define the concept of sustainability and a sustainable university, the interviewee defined these in relation to environmental issues particularly on how they relate to paper use. A sustainable university was defined as "a university that strives to minimise its environmental or ecological footprint to the level that is produced to all sectors of the society." He added that Rhodes University, being a knowledge centre, uses a great deal of paper and therefore it requires mechanisms to ensure sustainability in all of its activities, particularly on paper usage. He gave an example that any mechanism to reduce the amount of paper would be ideal to ensure that whatever paper that is used is certified by an appropriate company such as the Forest Stewardship Council.

Figure 4.3
Departmental notice board

In terms of the ***general awareness of the student body*** around issues related to sustainable paper usage, it was clear that students are obliged to print all their work as is required by academic staff (Figure 4.3). The interviewee confirmed this

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by saying, "it is still expected that students submit their assignments as hard copies for the convenience of evaluating the students work anywhere and anytime." Furthermore, he said, "I grew up reading hard copies for 50 years and that has become a lifestyle." To support this statement, he made an example about a student who once cheated the system by adjusting the assignment submission date online; the incident then resulted in a ruling not allowing any submission of digital copies for evaluation.

The respondent indicated that his department had no unique initiatives other than the ones already in place at Rhodes University, except for when a group of Environmental Science students conducted an audit on carbon emissions of the university. He mentioned that these students persuaded the VC to attend the presentations on the outcomes of the university carbon footprint; this resulted in the advent of the Green Fund to raise funds for the university's environmental issues. He indicated that minutes and agendas of the department of Environmental Science are now printed on both sides of the paper (Figure 4.4). In addition, recycling boxes have been made available in the department to promote recycling.

Figure 4.4
Meeting documentation printed double-sided

The interviewee stated that there was never a formal obligation for the University to ***respond to the mitigations*** recommended in the Amutenya *et al.* (2009) report. Furthermore, the interviewee, as co-author of the study argued that the shift to double-sided printing at Rhodes University could have been influenced more by overall global technology advancements. To conclude his argument he said that, "another possibility for the positive response to the mitigations recommended could have been influenced by his advocacy as chairperson of the environmental committee at the time."

Slack attitudes were highlighted as the main ***constraining*** factor, although it was expected that staff and students would eagerly receive the changes from an ecological perspective or as a financial imperative. Another challenge highlighted was that certain departments, particularly central administration and the library still send out messages in new envelopes,

instead of promoting the re-use of envelopes or rather the promotion of electronic communication.

The interviewee's response to *enabling* factors that enhance sustainable paper usage at Rhodes University was that there should be someone at management level that is prepared to fully support the environmental agenda. In addition, he also said it should be made mandatory for departments to comply with office recycling; he also proposed that double-sided printers be policy driven in order for people to comply.

With regard *to digital interventions* at Rhodes University, the interviewee acknowledged that there are great possibilities here, except that he is not a great supporter of advanced technology and prefers to use e-mail for communication. The interviewee's general comments were that more awareness is needed to minimise paper usage.

4.1.5 The Chairperson: Environmental Committee

The interviewee was identified due to his broad strategic position and engagement as the Head of Department: Economics and Economic History, a professor (academic staff) and chairperson of the Environmental Committee at Rhodes University.

The interviewee was passionate in expressing the need to promote sustainable environmental practices seriously; furthermore, he stated the need to reduce the carbon footprint and to improve the general efficiency of the departments around paper usage. Most importantly he indicated that it is also critical to realise the transition from paper use to a complete paperless environment. Since it is not always possible to shift entirely to electronic in the short term, a holistic approach is required to reduce paper usage to a greater extent. In other words, the university as a whole should be able to save on paper use. One typical way of doing this is to make use of double-sided printers, not only in offices but to also make a ruling in the common computer laboratories.

In terms of *policies and practices* it came as a surprise to the interviewee that Rhodes University is a signatory to the Talloires Declaration. The interviewee then admitted that he did not have the details of the Declaration; however, he mentioned that he is in support of any engagements that are in line with its conditions. Locally, Rhodes University has an existing environmental policy which the environmental committee and working groups such as the Green Fund and , sustainability working groups use and which environmental awards are

based on; however, it was indicated that the university has not yet updated its environmental policy as expected.

The interviewee admitted that there is *awareness* around sustainable paper usage at Rhodes University in that there is a movement towards promoting online learning and less paper use. For example, an online Economics lecturer has been introduced to first year students to replace some of the traditional lecturers. It was also mentioned that RUconnected is the most preferred tool that is used to make course hand-outs available online; also that most of the communication with students is done via RUconnected. It was indicated that the use of paper hand-outs is only used on rare occasions, when it is impossible to operate online due to unforeseen circumstances, which means that printed hand-outs are no longer made available to students. However, it was indicated that students are still expected to submit assignments as hard copies which means there has not been a complete move to a digital system.

In terms of the *initiatives* that promote sustainable paper use practices the interviewee said, "With all the interventions in place, we will eventually get there in the future, but we are not there yet." The Rhodes University system is not there yet, although there has been progress made. The Green Fund is another initiative that was established as a result of the outcomes of the environmental science study on carbon footprint, partly looking at ways to reduce paper usage.

The interviewee stated that the response to the *mitigations* as recommended in the above earlier reports were very positive. Stand-alone (desk top) printers in individual offices not connected to the network again reflected some *constraints* that prevent the institution's ability to promote sustainable paper usage. The interviewee also argued that, the functioning of committees can sometimes be a constraint if documents are only made available online, as not all of the university venues or facilities have the necessary IT equipment. The interviewee stated that even if agendas and minutes are distributed electronically, some people still print piles of documents in their own offices and bring these to the meetings. The interviewee also said MFD'S are a lot more expensive and difficult to maintain compared to one-sided printers and even though the multi-function printers are already being used in his department, there were individuals that still had stand-alone (desk top) printers in their offices.

According to the interviewee, the availability of sufficient resources and making provision for regular training are the most important *enablers* to enhancing sustainable paper usage at

Rhodes University. An element of awareness about double-sided printers that are connected to the network is growing as, the interviewee pointed out, they are already in use in their department.

There was a fairly positive attitude towards a paperless office environment and, the interviewee, as chairperson of the environmental committee, was in support of the introduction of *digital systems*. Therefore, in order for a paperless office environment to succeed, there has to be proper structures in place. The interviewee indicated that the use of digital platforms are being explored at Rhodes University, particularly within the HR division as staff leave forms are now completed online.

4.2 Surveys

The following section reports on the analysis of the office administrators' data and is listed as per the questions in the questionnaire. The surveys were to determine the office administrators' experiences, perceptions and attitudes towards paper usage at Rhodes University.

Since, the sample size was low to conduct a Chi-square test; the researcher decided to report the findings using frequencies and percentages as follows:

4.2.1 What does the concept "sustainable paper usage" mean to your department?

Figure 4.5 reflects the respondents' understanding of the concept of sustainable paper usage. Out of 10 that responded to this question, seven (70%) associated the concept of sustainable paper usage with reduction, re-use and recycling. Other definitions like management of paper, no waste in the department were the least used at one (10%). For example, many respondents felt that sustainable paper usage was linked with environmental conservation, as one respondent said,

> *"In my opinion, it means use of paper wisely and only print when necessary in order to save trees".*
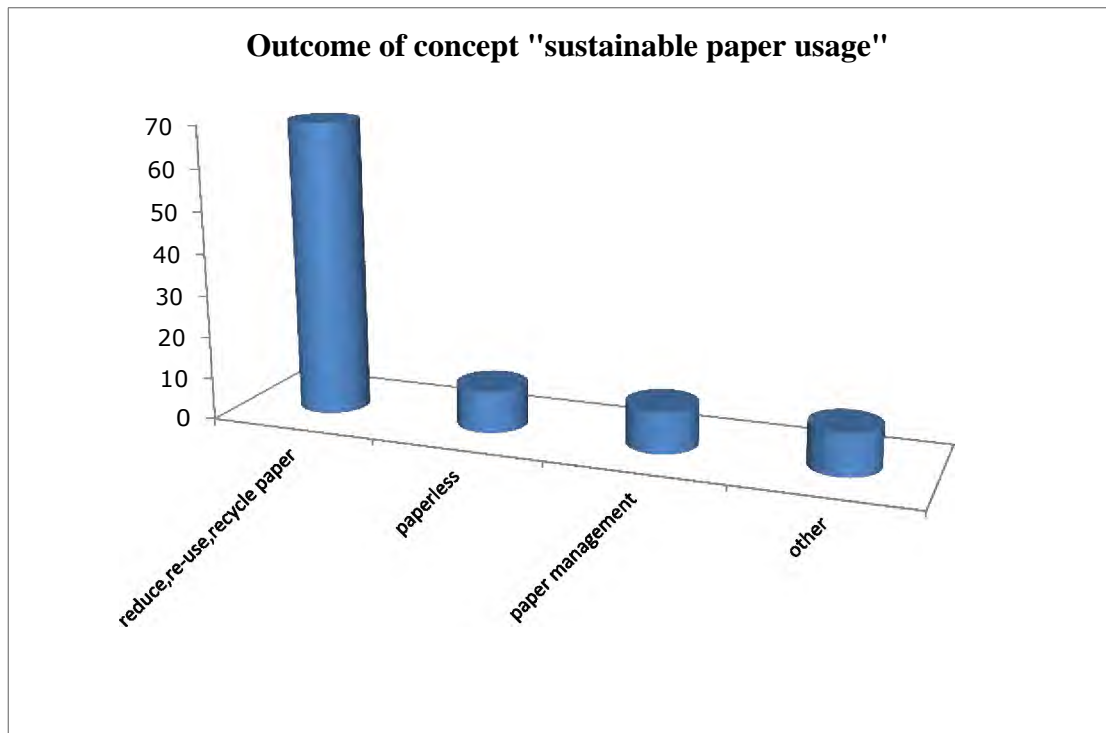
Figure 4.5 The meaning of sustainable paper usage

4.2.2 Approximately what is the percentage of your staff that have desk-top printers in their offices?

All departments reflected the use of stand-alone (desk-top) printers in their offices, although their level of use varied as they were also using MFD'S. A total of 2/11 (18%) of departments were solely using the stand-alone printers that are not connected to the network.

4.2.3 Approximately what is the percentage of staff who print to a shared multi-functional device (MFD) in your department?

A majority of administrative staff (73 %) appeared to be printing on MFD's and 1/11 (9%) indicated no use of MFD's.

When participants were asked on the format that their departments mostly print on, the response was that 7/11 (64 %) were mostly inclined to print their documents on double-sided A4 paper while the single sided A5 paper was the least preferred at 1/11 (9%). The remaining (27%) were still printing on single-sided A4 paper (Figure 4.6).

Print format

Legend:
- single sided A4 paper
- single sided A5paper
- double sided A4 paper
- double sided A5 paper
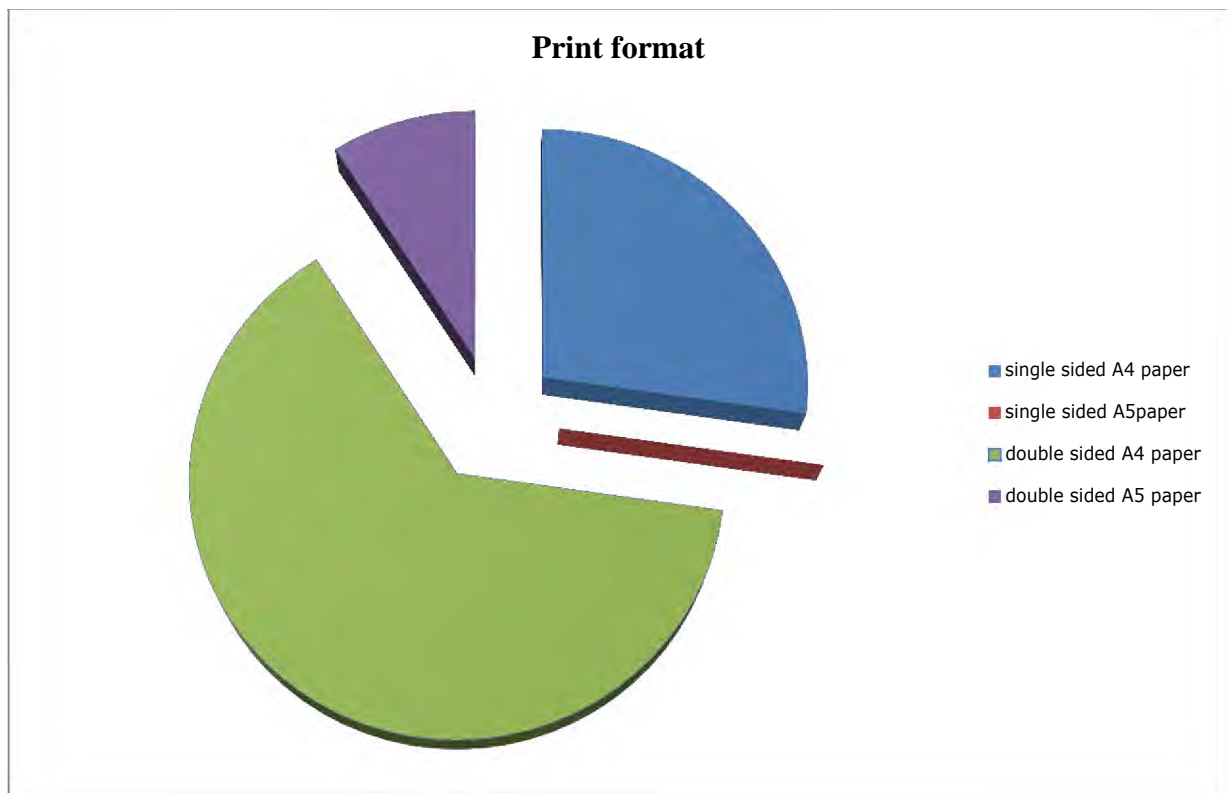
Figure 4.6 The most preferred formats of printing

4.2.4 How would you describe staff members' experience and attitude towards the use of multi-functional devices (MFD's) in your department?

Staff members in various departments were mostly receptive (6/11 or 55 %) towards the use of MFD's, and the initiative was well received in most departments, as one of the respondents stated;

> *"Positive attitude! The advantage of saving paper and ink outweighs the few disadvantages like, slow connection to the network printer and settings, sometimes resulting in printing an item twice, so there is waste. Queuing at the printer when there are too many copies being made at the same time."*

However, about 2/11 (18 %) of staff members were reported to have mixed opinions on this initiative (Figure 4.7). The culture at Rhodes University has a lot to do with how administrator's responded to this question, such that 3/11 (27 %) were still resistant to change to advancing technology initiatives (Figure 4.7).
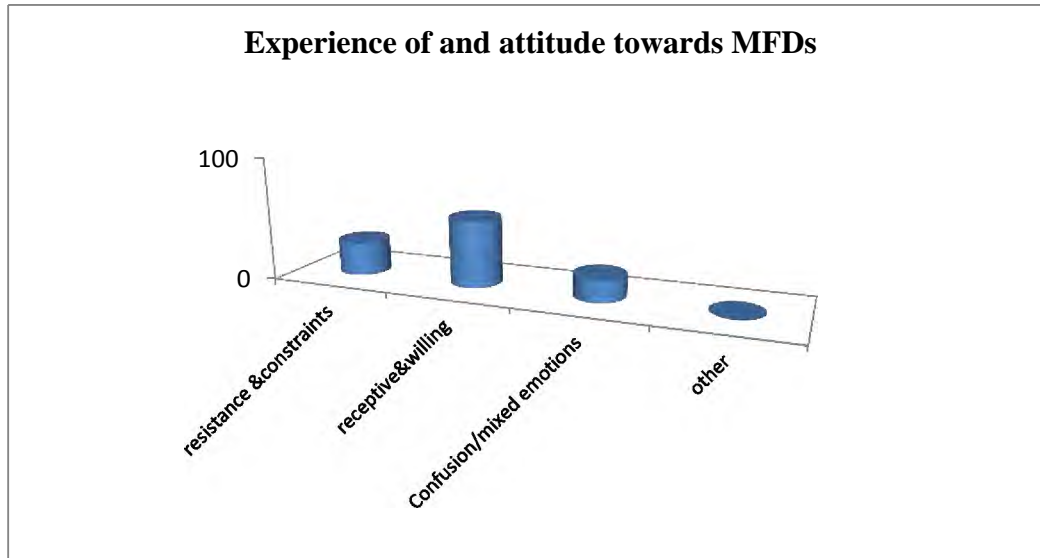
Figure 4.7 Staff members' experience of and attitude to MFD's

4.2.5 What paper recycling and re-use initiatives do you have in your department and how would you rate the success thereof?

The response provided by the office administrators on the department's level of awareness of paper recycling and re-use initiatives reflected that awareness is still lacking for recycling programmes. The majority of the respondents preferred to re-use paper (6/11 or 55%), and 5/11 (45%) were aware of the recycling programmes around campus. The findings showed that there is awareness around paper recycling and re-use, but the level of compliance is uncertain; for example, it was indicated that the efficiency of the recycling boxes in individual offices was not clear.

4.2.6 What is the most common barrier towards sustainable usage?

Out of 10 that responded, five (50%) identified lack of information and knowledge about the link between sustainable paper usage and the environment as the most common constraint, followed by resistance to change at three (30%). Interestingly, none of the respondents found lack of financial support to be a constraint (Figure 4.8).

Constraints

- lack info&knowledge
- lack participation&collaboration
- lack financial support
- resistance to change
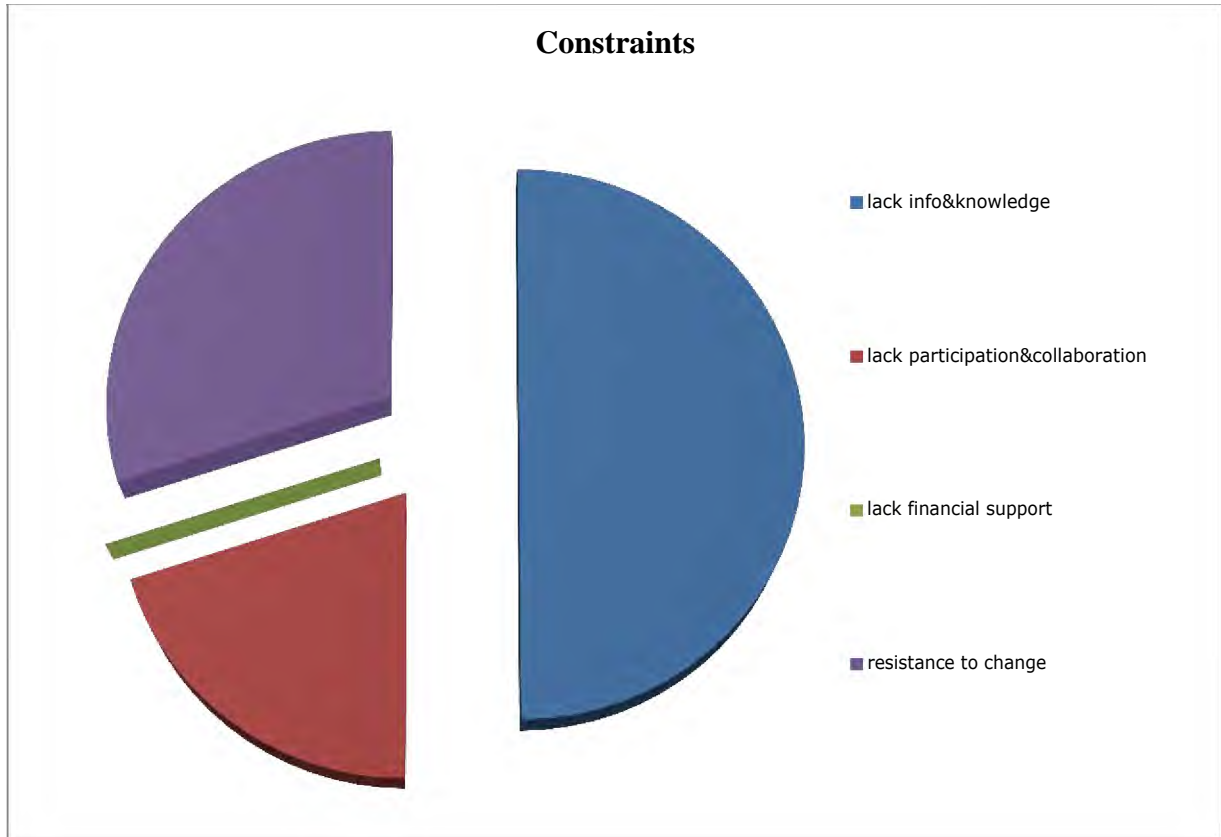
Figure 4.8 Common barrier towards sustainable usage

4.2.7 What do you think could be done to promote reduction of paper use?

The possible enablers mentioned towards reducing paper usage in the departments included a need for awareness campaigns at 4/11 (36%) followed by those that felt there is nothing to change at 3/11 (27%). Other possible enablers mentioned include promoting the use of electronic documents instead printing every document at 2/11 (18%). Double-sided printing and the use of hard copies were the least rated enablers to promote sustainable paper usage, at 9% for each (Figure 4.9).

Enablers

Legend:
- Awareness
- Electronic docs
- Nothing to change
- Use hard copies
- Encourage double sided
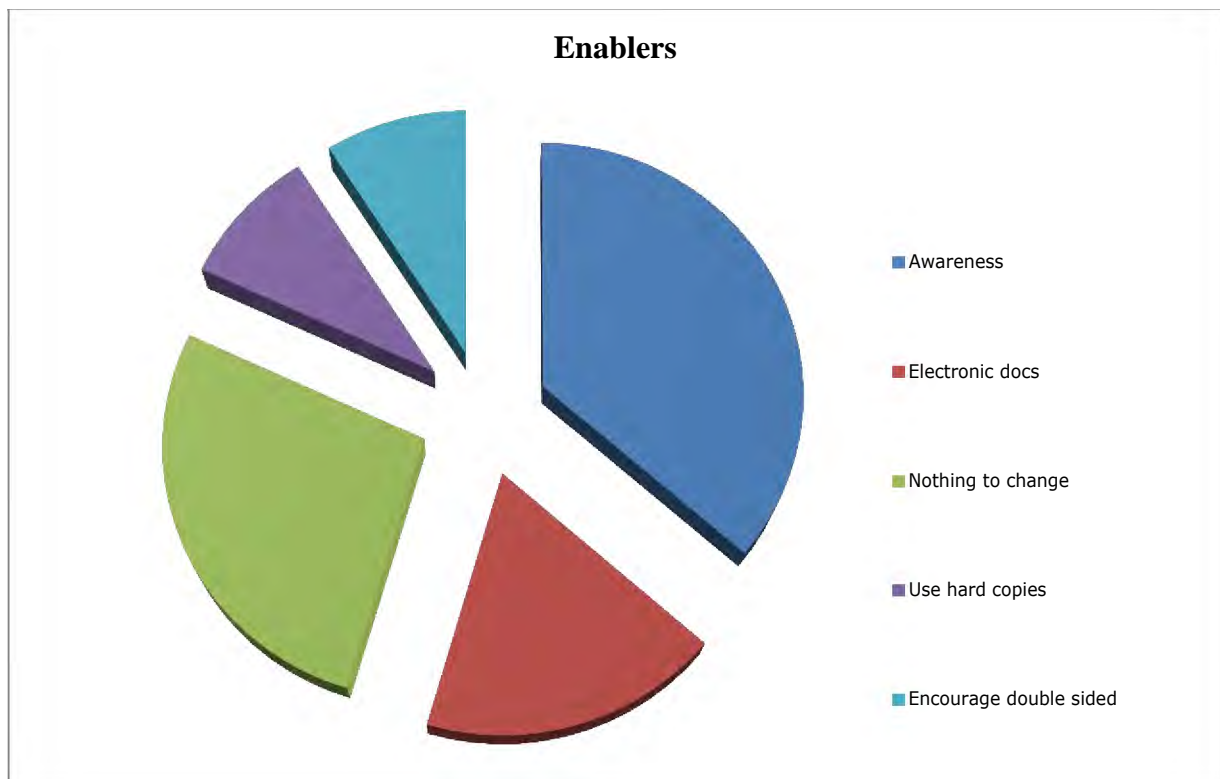
Figure 4.9   Potential enablers promoting reduction of paper use

4.2.8 What is the most preferred way of communication with different individuals in the department?

All 11 (100%) respondents preferred the use of email as a tool to distribute agendas and minutes of departmental meetings to staff. The most common way that was preferred for correspondence between the departments and the students was email at (73%), with low levels of usage for departmental notice boards (9%). A majority of departments preferred the use of email (10/11 or 91%) for communicating with their colleagues, 1/11 (9%) preferred face-to-face, whilst most academics preferred to communicate with students using email at 6/11(55%) and less than 50% using RUconnected (Table 4.1).

Table 4.1   Most preferred ways of communication within departments

Tools	Administrative communication	Communication with students	Communication with colleagues	Academics with students
Departmental notice boards		1/11 (9%)		
Email	11/11 (100%)	8/11 (73%)	10/11 (91%)	6/11 (55%)
RUconnected		2/11 (18%)		5/11 (45%)
Social media				
Website				
Letters				
Other			1/11 (9%)	

4.3 Conclusion

The findings of the study were presented in this section. In the first sub-section, the findings of the five (5) interviews were presented whilst the second part presented the findings of the eleven (11) office administrative staff's online survey. The findings of the surveys also reflected on the limitations of performing certain statistical analysis due to the fact that not all the data required was obtained. In section 5, these findings are compared and discussed in order to identify the enablers that would promote sustainable paper usage at Rhodes University.

Section 5. Discussion

This section discusses the findings that were presented in section 4; the discussion is structured in response to the key questions of this study. The focus of this discussion is on the comprehensive perspectives of the findings emerging from the interviews, online survey and observations.

5.1 The understanding of the concept of sustainability, a sustainable university and a sustainable paper usage

5.1.1 Sustainability

The findings reflected a broad understanding of the concept of sustainability. Interestingly, the concepts sustainable development and sustainability are used interchangeably in that they both seek to generate stability between the environment, economics and society. Sustainability was defined as maintaining a balance in the utilisation of resources, particularly in relation to paper usage, as was also evident in the literature. Gottlieb *et al.* (2012:193) for example, defined sustainability as a way of life that takes into consideration the limitations of the natural environment to support human activity. Adding a temporal dimension to the definition, King and Lessidrenska (2009:44) see sustainability as a journey and that it requires everyone's commitment towards a planned goal. According to Alshuwaikhat and Abubakar (2008:1779) sustainability should serve as means of configuring the campus and its various activities so that its members and economies are able to meet their needs and express their greatest potential in the present and plan for the ability to maintain these ideals in the long-term. It was indicated that in order to achieve sustainability, it is important to ensure that all people are able to live within the means of nature (Gottlieb *et al.* 2012:193).

5.1.2 Sustainable university

Responses to the request to define a sustainable university were not clear as it was defined only in relation to maintaining a sustainable environment within a university. This was in support of the idea that the application of sustainable development for universities is relatively new and a challenge to define because of its complexity (Waheed *et al.* 2011:721). According to Velazquez *et al.* (2006:812), the concept is described in terms of higher education as a whole or in part that includes and supports the minimisation of negative

environmental, economic, societal and health effects generated by the use of resources in order to fulfil its functions of teaching, research, outreach, partnership and stewardship to assist society make the transition to a sustainable lifestyle. It was necessary for the various initiatives that were implemented and those that are proposed to ensure sustainable paper usage at Rhodes University.

5.1.3 Sustainable paper usage

This concept of sustainable paper usage was mostly associated with paper recycling, re-use and reduction in the amount of paper used by the University. Some of the strategies suggested include reducing paper wastage by adopting measures such as double-sided printing, re-using paper and only printing when one really needs to. To some it means using paper wisely and only printing when it is absolutely necessary in order to save trees. Although in some instances the concept was associated with management of paper, sustainable paper usage can be simplified as finding ways of ensuring the amount of paper used is not detrimental to the environment, or social and economic conditions. This would have a positive impact on the University as it will not only benefit paper users, but will also enable the institution to reduce costs.

5.2 Policies and practices towards sustainable paper usage

All respondents agreed with the importance of having policies on campus for regulation of campus initiatives towards a greener future. In addition, the Support Manager: IT Division and the Chair of the Environmental Committee and an Associate Professor in Environmental Science supported the need to have a designated individual to support the environmental agenda at policy level as this would improve the implementation of any strategy that intends to promote a sustainable university. It was clearly indicated that most of the initiatives undertaken for environmental conservation should be in line with the University's environmental policy in order to encourage compliance and to fast track its implementation. Policy endorsement by management is crucial for compliance and for setting the norm for campus-wide participation in sustainable paper-usage activities (Amutenya *et al.* 2009:241). Most importantly, as a signatory of the Talloires Declaration, Rhodes University has an obligation to strive towards meeting the conditions of the Declaration (Amutenya *et al.* 2009:238).

Having incentives and policies could therefore play a significant role in reducing the amount of paper usage. In order for any activity or initiative to be recognised and accepted at implementation level it must have the support of senior management at the policy and decision making level. Amutenya *et al.* (2009:238) and Smyth *et al.* (2010:1013), for example, recommend that institutions should have a policy that require all university documents to be paperless where possible or, where that is not possible, for them to be printed on both sides.

The lack of advocacy from senior management seems to constrain sustainable practice as some of the initiatives would not be widely implemented because of resistance in the university culture. Alshuwaikhat and Abubakar (2008:1784) for example, highlight the importance of challenging the university community to re-think and re-construct their environmental policies and practices in order to contribute to sustainable development at local, national and international levels.

5.3 The institutional response to the recommendations regarding sustainable paper usage of the two earlier studies

With regard to sustainable paper usage the data generated by this research project reflects a positive response from the University to the recommendations of the two earlier studies. The implementation of double-sided printers in student computer laboratories and academic departments, in particular, represents a major shift from earlier practice, even though it seems not to be driven by policy. Despite challenges such as lack of awareness and consequent lack of compliance in some quarters, paper recycling seems to have become common practice.

Since double-sided printing is still not fully implemented, it was suggested that this should be regulated in order to ensure compliance. It was further indicated that adequate recycling and paper re-use campaigns are not in place; in addition, digital systems are not fully utilised and much awareness raising is still required to facilitate implementation of these mitigations. There were also limited interventions mentioned in the area of paper re-use at Rhodes University; instead the University distributes used and shredded paper to pre-schools and funeral parlours around Grahamstown.

Some of the respondents felt that double-sided printing of student hand-outs led to a reduction in the amount of paper used. Respondents also indicated that although the mitigations were aimed at reducing the amount of paper used within the institution, these

aims were not fully realised as there is still a large amount of paper being consumed due to the requirement that students have to submit hard copies of their assignments for assessment purposes. It thus became clear that the mitigations that were implemented were merely focusing on reducing paper usage rather than on possible alternatives that would completely eliminate the use of paper. This means that even though the number of sustainable development initiatives are increasing and people are becoming more engaged in sustainable development, like most institutions, Rhodes University still maintains the traditional way of doing things (Lazano *et al.* 2011:1). This echoes the experience of Heil (2009), former assistant principal of Edinburgh's Telford College: "people hang onto paper work from meetings and things when they really don't need to. [However, nowadays] ... everything is available online; keeping paper copies is a thing of the past."

One of the co-authors in the Amutenya *et al.* (2009) study, who was interviewed for this research, explained that there was never any formal obligation for the University to respond to the mitigations recommended in their study; some of the recommendations merely seem to have been adopted in a *laissez faire* manner. The Leslie *et al.* (2009) study, on the other hand, extended a formal invitation to the Vice Chancellor (VC) to attend the presentation of the findings of the audit on the universities' carbon emissions, which subsequently led to the establishment of the VC's Green Fund initiative, aimed at raising funds for environmental issues on campus.

5.4 The conditions that enable or constrain sustainable paper usage

Respondents most frequently cited the following constraints to minimisation of paper usage: lack of information and knowledge about the link between sustainable paper usage and the environment, the absence of awareness campaigns, and resistance to change. A slack attitude, lack of interest and resulting resistance to change also transpired clearly as some of the biggest challenges, particularly amongst academic staff. This finding mirrors that found in the literature e.g. Lozano *et al.* (2011:3) indicate that some of the reasons why universities resist participation in sustainable development include lack of awareness, insecurities and threats to academic credibility from educators, overcrowded curricula, lack of support, sustainable development still considered to have little or no relevance to the course or discipline, uncertainty regarding the efforts required to engage with and incorporate sustainable development, and restricting organisational structures.

The contribution of stand-alone (desktop) printers to environmentally unsustainable practices was also an issue in the research data. Among other challenges that prevented the transition to online teaching and learning methods, was the reluctance to use the technology as a tool especially for the large numbers of undergraduates due to limited resources available (Mostert 2009:1). Since 2009, it seems there has been some improvement in the availability of online resources as teachers of many of the large first year classes have started to introduce the learning management system in their teaching.

Lack of awareness towards minimising paper usage was among the most frequently mentioned constraints which respondents felt needed urgent action; this could be in the form of increasing awareness-raising campaigns and training. The recycling programmes, for example, experienced problems as recyclables were mixed with non-recyclables and the dearth of recycling bins around campus. Another constraint experienced included the lack of support and directives from senior management at policy level; this resulted in people doing as they please without any coordination of efforts as there were no regulations. The same lack of financial support and resources, and resistance to change were also perceived as the largest barriers to sustainability initiatives in Canadian universities (Wright and Wilton 2012:118,124; Evangelinos *et al.* 2009:1160; Smyth *et al.* 2010:1013). Financial barriers were often reported as major hurdles to achieve institutional sustainability and many participants were not optimistic about this barrier being resolved in the near future (Wright and Wilton 2012:124). In this study the lack of financial resources did not emerge as having a major impact, even though the acquisition of the required resources to promote a sustainable university would need funding.

The initiatives recommended in the research towards more sustainable paper usage include increasing awareness raising programmes, accompanied by the availability of coloured and clearly labelled recycling bins. Replacing the poorly labelled and unevenly distributed paper receptacles was seen as having the potential to achieve higher paper recycling rates (Smyth *et al.* 2010:1013). This means that the university has to make funds available to enable such initiatives towards sustainability. In addition, advocacy from senior management at policy level would enable the university to promote the need to have a policy that regulates compliance with sustainable paper usage.

The availability of sufficient resources and the provision of regular training are seen as some the most important enablers for enhancing sustainable paper usage at Rhodes University.

Some of the enablers mentioned included: an increase in awareness and training initiative programmes to minimise paper usage, as well as having a policy in place that supports and controls the use of paper. Management support and a policy-driven environmental agenda were also given consideration. Initiatives focused on increased utilization of digital media are supported by the excellent information technology infrastructure at Rhodes University.

There were contradictory perceptions around the level of awareness of students, academic staff and the office administrators. Some felt the students' level of awareness was better than that of the academic staff, as indicated by the fact that staff are the ones that influence the excess use of paper as they still require students to submit their assignments, written tests and tutorial exercises as hard copies. However, it was indicated that these differences are not easily discernible, such that one of the respondents described the level of awareness as being a mixed bag.

5.5 The Rhodes University response to digital interventions

The response to the proposed digital interventions for academics, administrators and student social campaigns was positive. The results generally showed a need to increase the digital systems that would promote a paperless environment at Rhodes University. The use of a digital system for teaching and learning is mainly done through the learning management system, RUconnected; there was also an indication of a shift towards making lectures available online, as was recently introduced to the 1st year Economics class. However, it was felt that the use of electronic media for students is limited as their lecturers often require them to produce their work on paper. Again, in the area of student advertisements of social events, it was recommended that digital notice boards be made available to move away from the use of paper posters around campus. Social media was also proposed as a tool that could be a viable alternative for advertising events on campus.

Administratively, the responses indicated extensive and sophisticated digital systems on campus, in that some programmes were already in place to promote more participation. Some of the examples mentioned included Rhodes University's Human Resources Division, some of the Support Services and the Printing Unit Services which are among those units that have shifted to a more paperless system of operation. In terms of media communication, the respondents indicated a transition from paper usage and have promoted the use of e-mail as the preferred medium of communication. Office administrators used only e-mails (100%) for

all of their administrative communications with other colleagues, students and academics (including mailing lists and RUconnected).

Section 6. Conclusion and Recommendations

6.1 Conclusion

An analysis of the conditions that promote or constrain sustainable paper usage in the investigation of staff and student attitudes and perceptions on sustainable paper usage at Rhodes University are summarised as follows:

In terms of the overall investigation of the institutional response to the mitigations that were recommended by the two earlier studies it seems that there are clear interventions that are already in place for some areas. These include the existence of an environmental policy which regulates paper re-use, recycling programmes and the availability of double-sided printers around campus. In contrast, the use of digital systems to mitigate unsustainable use of paper is the only recommended mitigation strategy that seems not to be implemented successfully.

The enablers identified which would promote the implementation of sustainable paper usage include awareness raising campaigns, the increased availability of recycling bins and support from senior management of the University, all of which promote the idea of a sustainable university at policy level and through resourcing initiatives on the ground.

Some of the constraints that prevented the successful implementation of the recommended interventions identified by this study include: lack of information and knowledge about the link between sustainable paper usage and the environment, the absence of sufficient awareness raising campaigns and resistance to change. While sustainable paper usage practices are being promoted through the provision of appropriate technologies such as double-sided printers, it seems that most of the resistance to sustainable paper use practices relate to an academic and institutional culture that does not value the relationship between paper use and the environment. While a willingness to engage with paper saving practices exists in some service divisions (such as the Information Technology Division), the interventions implemented by those divisions are often not adopted by the end-users; often it seems, purely for reasons of convenience of the end-users. In addition, the collaborative and collegial nature of university governance structures means that any attempt at forcing compliance with policy requirements are likely to be less effective.

Whereas it is crucial for universities to take sustainable environmental practices seriously for all of the reasons discussed above, it is not surprising that it is rare to find a university that has fully embraced the sustainability imperative (Wright and Wilton 2012:118).

6.2 Recommendations

In light of the resistance to change imposed by the collegial nature of academic governance structures mentioned above, this study proposes that education and awareness raising campaigns are some of the most powerful tools at the disposal of the institution for enabling change in paper use practices, especially if such awareness raising campaigns can speak directly to the moral obligations and collective social responsibility of the university community.

For these reasons, this study would therefore like to make the following proposals:

- Rhodes University's Environmental policy should be updated to reflect new affordances of digital technologies in mitigating unsustainable paper-usage. In addition, this policy should include guidelines for promoting sustainable paper-usage on ground level through the use of digital technologies;

- An in-depth investigation into the potential of digital systems such as cloud computing (e.g. Google Drive) and electronic document management systems (e.g. Alfresco) to mitigate the unsustainable paper-use practices in relation to university governance through committee meetings, together with recommendations for resourcing of awareness-raising campaigns and training of end-users.

- An in-depth investigation into the potential of social software and social networking (e.g. Facebook, Twitter) to mitigate the unsustainable paper use practices caused by the advertising of events of academic departments, the SRC, student societies, and sport clubs through the use of paper posters on notice boards, together with recommendations for resourcing of awareness raising campaigns and training of end-users.

- A concerted effort, through awareness raising campaigns and training of end-users, to enhance adoption of the learning management system RUconnected , both for making resources available to students as well as for digital submissions of student assignments and online marking of essays.

- A concerted effort, through awareness raising campaigns and training, to enhance the adoption of multifunction devices in academic and administrative departments and to set the default format for printing to double-sided and possibly reduced size printing, to allow for two pages to be printed on one (A4) sheet of paper.

- Promote sustainable paper use in academic departments and residences through coloured recycling bins.

- Make funding available (e.g. from the Green Fund) to remunerate students who participate in the above-mentioned awareness raising campaigns and training of end-users, especially those related to multifunction devices and social media.

6.3 Suggestions for future research

The recommendations above contain two possibilities for further research which would provide the institution with valuable research data for implementing more sustainable paper use practices: a proposal related to the use of cloud computing and another related to the use of social media.

Furthermore, it is recommended that a similar study be repeated at Rhodes University with a focus to assess the response of the University towards a paperless environment after implementing the above recommendations.

6.4   Lessons learnt in the study

Conducting data collection during the last semester of the year in a tertiary institution is not advisable, as everyone is in the end of the year rush. Making provision for incentives to attract participants does not necessarily guarantee participation in surveys. Online surveys are no longer receiving much attention in the 21st century as people avoid wasting their time on surveys, especially in cases where the survey is not of importance or interest to identified participants, because in most cases it takes at least 30 minutes to complete.

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Appendix A: Letter of permission

The Registrar
Rhodes University
Grahamstown

Dear Dr Fourie

Request for permission to conduct research at Rhodes University for a Master's in Business Administration Programme

I Nondumiso Gloria Mfenyana, an MBA student at Rhodes Business School (student no. 610M7159) hereby request permission to conduct research at Rhodes University. The title of the study is: ***An investigation into the enabling and constraining conditions for sustainable paper usage at Rhodes University.*** The research proposal, including ethical clearance, which was approved by the Commerce Higher Degrees Committee on the 21 June 2012, is attached herewith. Supervised by Mr Markus Mostert and Ms Nompilo Tshuma of the Centre for Higher Education Research, Teaching and Learning, the research methodology includes interviews selected staff and students.

I intend to collect data during August 2012, depending on the availability of the participants. A request for participation will be emailed to potential participants to ascertain their availability and gain their consent. A copy of the dissertation will be made available at the University library and the research findings might be published in academic journals.

I look forward to your favourable response in order to initiate the schedule for data collection.

Yours Sincerely

Nondumiso Mfenyana (Mrs)

Appendix B: Interviews

Appendix B.1   Example of an email sent to interviewees:

Dear Sir/Madam

Request to conduct an interview for a research study

I hereby request to conduct an interview with you as part of data collection for my MBA research project with Rhodes Business School. Your participation has been identified because of your functions in the IT Division and the extensive work you have initiated in promoting the use double sided-printing in the student computer labs. I request that I meet with you on ***Monday 26 November or Tuesday 27 November 2012, between 10:00 and 16:00;*** the interview will be no longer than 30 minutes. I would appreciate it if you could confirm that the interview can be conducted in your office. I would also like to request your permission to record the interview so as to facilitate transcription thereof.

My research project, ***an investigation into the enabling and constraining conditions for sustainable paper usage at Rhodes University*** aims to explore Rhodes University's response to the recommendations of two earlier studies (published in 2009) with regard to the use of paper by the University community. This study is supervised by Mr Markus Mostert and Ms Nompilo Tshuma of the Centre for Higher Education Research, Teaching and Learning. For your convenience I have attached a copy of the research proposal, which was approved by the Commerce Higher Degrees Committee on the 21 June 2012. I have also obtained permission (on 2 July 2012) from the Registrar, Dr Fourie, to conduct this research at Rhodes University.

I intend to send you the interview questions by Friday 23 November 2012, prior to the interview. Upon your request, I will provide you with a copy of the interview transcript as well as with a copy of the final research report. You will be free to withdraw from the research and/or request that your transcript not be used at any time until the submission of the dissertation.

Kindly confirm your availability by email by ***Thursday, 22 November 2012.*** Please forward your queries or any area clarity about the extent of your involvement in the research project.

I look forward to your reply

Yours sincerely,
Nondumiso Mfenyana (Mrs)

Appendix B.2   Interview Schedules

SRC Environmental Councillor

Introductory statement:

This study aims to investigate Rhodes University's response to recommendations emerging from two earlier studies as it relates to sustainable paper usage. In addition, attitudes and perceptions that might promote or constrain sustainable paper usage in teaching, learning and other activities at Rhodes University will be explored.

The interview will be recorded to facilitate transcription thereof. Your response, opinions and suggestions are most valuable for the assessment and will be documented as per your office. Interview transcript and a copy of the final research report will be made available upon request. You can withdraw from the research and/or request that your transcript not be used at any time until the submission of the dissertation.

1. How would you as SRC Environmental Councillor rate Rhodes University's **policies** and **practices** with regard to environmental sustainability?

2. From your experience as SRC Environmental Councillor, how would you rate the **student** body's general awareness of issues related to sustainable paper usage?

   ■ How would you describe student practices/activities with regard to sustainable paper usage and its relation to their carbon footprints?

3. Similarly, how would you rate the general awareness of **academic staff** about issues related to sustainable paper usage and its relation to their carbon footprints?

   ■ How would you describe staff practices (including their expectations of students with regard to printing assignments, for example) as it relates to sustainable paper usage?

4. Similarly, how would you rate the general awareness of **administrative staff** about issues related to sustainable paper usage and its relation to their carbon footprints?

   ■ How would you describe administrative staff practices (including their expectations of students) as it relates to sustainable paper usage?

5. Have you, in your capacity as SRC Environmental Councillor, introduced any **initiatives** to promote sustainable paper use practices and how would you rate the success thereof.

6. Two earlier studies conducted at Rhodes University (Leslie *et al.* 2009; Amutenya *et al.* 2009) made the following recommendations with regard to sustainable paper usage:

   ■ that student hand-outs be printed on both sides of paper sheets and paper re-use;

   ■ a policy to regulate such double-sided printing;

   ■ the acquisition of "duplex" printers;

   ■ the use of electronic media for communication and dissemination of information such as student hand-outs;

- ■ implementation of effective recycling programs by increasing the availability of recycling bins in order to promote recycling behaviour; and

- ■ both studies demonstrated the economic and reputational advantages of implementing the recommended strategies for minimizing paper usage.

  - ■ To what extent do you believe Rhodes University has responded to these recommendations and how would you rate the success of these intervention strategies?

7. What would you identify as the two or three most important enabling factors for enhancing sustainable paper usage at Rhodes?

8. Which are the two or three most important factors that constrain the Institution's ability to promote sustainable paper usage?

9. Are you aware of sustainable paper use practices at any other higher education institutions in South Africa and abroad that might be usefully implemented at Rhodes?

10. Would you like to make any suggestions of questions that I could usefully include in a questionnaire for environmental reps in residences?

11. Do you have anything else to add to these questions?

Thank you for your participation!

Appendix B.3   Support Manager: IT Division

Introductory statement:

> *This study aims to investigate Rhodes University's response to recommendations emerging from two earlier studies (Leslie et al. 2009; Amutenya et al. 2009) as they relate to sustainable paper usage. In addition, attitudes and perceptions that might promote or constrain sustainable paper usage in teaching, learning and other activities at Rhodes University will be explored.*
>
> *The interview will be recorded to facilitate transcription thereof. Your response, opinions and suggestions are most valuable for the assessment and will be documented as per your office. Interview transcript and a copy of the final research report will be made available upon request. You can withdraw from the research and/or request that your transcript not be used at any time until the submission of the dissertation.*

General

1. How would you describe the student body, administration staff and academic staff's general awareness and response to issues related to sustainable paper usage?

Recommendations of two earlier studies (Leslie *et al.* 2009; Amutenya *et al.* 2009)

With regard to the use of paper, the above-mentioned reports recommended
- re-use of paper (by printing on the unprinted side of paper);
- double-sided printing (through the use of double-sided printers); and
- recycling of paper.
2. What strategies were implemented in response to these recommendations and what was the IT Division's involvement in those implementations?
3. How would you describe the impact of these interventions on the amount of paper used at Rhodes University?
4. Has the IT Division publicised the availability of double-sided printers to staff and students?
5. How would you evaluate the acquisition of double-sided printers specifically on the amount of paper used at Rhodes?
6. Do you believe that the availability of double-sided printing has actually resulted in people printing on both sides of sheets of paper or is it possible that their practices might not have changed all the significantly?
7. Are you aware that the issue of double-sided printing is addressed at policy level?
8. What have been the barriers and enablers to this initiative?
9. Besides double-sided printers, what other initiatives have you put in place that promote sustainable paper usage?
10. How would you evaluate the success of replacing desktop printers in individual offices with multi-function devices in departments?

Possible future strategies

11. In general, to what extent do you believe has there been a shift from paper to electronic media for communication, teaching and learning and administration at Rhodes?
12. How would you evaluate the impact of digital platforms such as ROSS, ePrints, RUconnected and Google Drive on the amount of paper that is used at Rhodes University?
13. What would you suggest could be done to ensure that such digital platforms are made more productive with regard to minimising paper usage?
14. How do you feel about the potential of digital solutions such as an Enterprise Document Management System (EDMS) or Google Drive for managing the administrative functions of the University such as correspondence and meeting agendas and minutes?
15. What would you perceive as the potential enablers and potential obstacles for introducing the idea of a paperless office environment (e.g. through an EDMS or Google Drive) at Rhodes University?
16. Do you believe that the use of social media such as Facebook and/or Twitter offers a viable alternative for the use of posters for advertising events on campus?
17. If yes, what strategies would you suggest for shifting from paper-based to digital advertising on campus?

Conclusion

18. Do you have any other comments or suggestions to make with regard to the sustainable use of paper at Rhodes University?

Thank you for your participation!

Appendix B.4 Safety, Health and Environmental Officer

Introductory statement:

This study aims to investigate Rhodes University's response to recommendations emerging from two earlier studies (Leslie et al. 2009; Amutenya et al. 2009) as they relate to sustainable paper usage. In addition, attitudes and perceptions that might promote or constrain sustainable paper usage in teaching, learning and other activities at Rhodes University will be explored.

The interview will be recorded to facilitate transcription thereof. Your response, opinions and suggestions are most valuable for the assessment and will be documented as per your office. Interview transcript and a copy of the final research report will be made available upon request. You can withdraw from the research and/or request that your transcript not be used at any time until the submission of the dissertation.

General

1. How would you describe the student body, administration staff and academic staff's general awareness and response to issues related to sustainable paper usage? Do you believe that there is any progress towards minimizing paper usage?
2. What initiatives are in place towards sustainable paper usage at Rhodes University?
3. How effective are the re-use and recycling programs that are in place in ensuring a sustainable university?

Recommendations of two earlier studies (Leslie *et al.* 2009; Amutenya *et al.* 2009)

With regard to the use of paper, the above-mentioned reports recommended:

- re-use of paper (by printing on the unprinted side of paper);
- double-sided printing (through the use of double-sided printers); and
- recycling of paper.

4. How much of the recommendations of these reports have been implemented, particularly in relation to paper use?
5. To what extent do you think the university has responded to the mitigation recommended and how would you rate the success of the interventions?
6. In your area of work, what have been the enabling conditions for sustainable paper usage?
7. What constraints do you encounter regarding the adoption and the implementation of the recommendations made on the above mentioned reports as it relates to the use of paper?

Possible future strategies

8. How feasible is the purchase of recycled paper for Rhodes University?
9. Do you think the use coloured wheelie bins would increase paper recycling at RU?

10. Although important documents are available on the RU website, but some of the processes happen offline (hard copies required), e.g. application for admission at RU, online job application, etc. How open would RU be to the idea of a paperless office environment?
11. Has Rhodes University ever explored the use of digital platforms such as *Enterprise Document and Record Management Solutions* to manage the documents related to administration e.g. council, senate and committee agendas and minutes, leave application forms, online venue booking system, Email communication (as requirement) etc.
12. How do you feel about the potential of digital solutions such as an *Enterprise Document Management System* (EDMS) or *Google Drive* for managing the administrative functions of the University such as correspondence and meeting agendas and minutes?
13. What would you perceive as the potential enablers and potential obstacles for introducing the idea of a paperless office environment (e.g. through an EDMS or Google Drive) at Rhodes University?

Conclusion

14. Do you have any other comments or suggestions to make with regard to the sustainable use of paper at Rhodes University?

Thank you for your participation!

Appendix B.5   Interview Schedule: Associate Professor – Environmental Science

__Introductory statement:__

This study aims to investigate Rhodes University's response to recommendations emerging from two earlier studies (Leslie et al. 2009; Amutenya et al. 2009) as they relate to sustainable paper usage. In addition, attitudes and perceptions that might promote or constrain sustainable paper usage in teaching, learning and other activities at Rhodes University will be explored.

The interview will be recorded to facilitate transcription thereof. Your response, opinions and suggestions are most valuable for the assessment and will be documented as per your office. Interview transcript and a copy of the final research report will be made available upon request. You can withdraw from the research and/or request that your transcript not be used at any time until the submission of the dissertation.

General

1. What is your understanding of "sustainability" and a "sustainable university" and how does that relate to the use of paper?
2. Have you implemented any initiatives on sustainable paper usage in your department and what has been the success thereof?
3. In your experience, what are the factors that constrain sustainable paper usage at RU?
4. What are factors in the institution that enables sustainable paper usage?

Recommendations of two earlier studies (Leslie *et al.* 2009; Amutenya *et al.* 2009)

5. How did RU respond to the mitigations as recommended in the above earlier reports?
6. Are you aware of any double-sided printers being made available on campus?
7. Do you have access to a double-sided printer in your office environment?
8. Do you think it is fair to surmise that the mitigation strategies recommended by the two 2009 studies focussed more on changing practice related to paper usage, rather than focussing on alternatives to paper usage?

Your role as a lecturer / supervisor

9. As a lecturer, would you rather make course hand-outs available online (e.g. on RUconnected) or have hard copies printed (of notes or hand-outs) for any of your courses?
10. Do you expect your students to submit hard copies of assignments? If yes, why?
11. Would you be prepared to accept only digital copies of student assignments and mark on-screen? If not, why not?

Possible future strategies

12. How do you feel about the potential of digital solutions such as an *Enterprise Document Management System* (EDMS) or *Google Drive* for managing the administrative functions of the University such as correspondence and meeting agendas and minutes?

13. What would you perceive as the potential enablers and potential obstacles for introducing the idea of a paperless office environment (e.g. through an EDMS or Google Drive) at Rhodes University?

Conclusion

14. Do you have any other comments or suggestions to make with regard to the sustainable use of paper at Rhodes University?

Thank you for your participation!

Appendix B.6   Chairperson: Environmental Committee

Introductory statement:

This study aims to investigate Rhodes University's response to recommendations emerging from two earlier studies (Leslie et al. 2009; Amutenya et al. 2009) as they relate to sustainable paper usage. In addition, attitudes and perceptions that might promote or constrain sustainable paper usage in teaching, learning and other activities at Rhodes University will be explored.

The interview will be recorded to facilitate transcription thereof. Your response, opinions and suggestions are most valuable for the assessment and will be documented as per your office. Interview transcript and a copy of the final research report will be made available upon request. You can withdraw from the research and/or request that your transcript not be used at any time until the submission of the dissertation.

General

1. What are the most important reasons for universities to take sustainable environmental practices seriously?
2. How has Rhodes University responded to its commitments as signatory to the Talloires Declaration?
3. Where can I find an updated version of the university's environmental policy, the website only has the 1998 version?
4. What are the reasons for RU to focus on the sustainable use of paper?
5. In your experience, what are the factors that constrain sustainable paper usage at RU? What are the challenges related to sustainable paper usages?
6. What are the factors in the institution the enables sustainable paper usage?

Recommendations of two earlier studies (Leslie *et al.* 2009; Amutenya *et al.* 2009)

With regard to the use of paper, the above-mentioned reports recommended

- re-use of paper (by printing on the unprinted side of paper);
- double-sided printing (through the use of double-sided printers); and
- recycling of paper.
7. How did RU respond to the mitigations as recommended in the above earlier reports?
8. Are you aware of any double-sided printers being made available on campus?
9. Do you have access to a double-sided printer in your office environment?
10. Do you think it is fair to surmise that the mitigation strategies recommended by the two 2009 studies focussed more on changing practice related to paper usage, rather than focussing on alternatives to paper usage?

Your role as a lecturer / supervisor

11. As a lecturer, would you rather make course hand-outs available online (e.g. on RUconnected) or have hard copies printed (of notes or hand-outs) for any of your courses?

12. Do you expect your students to submit hard copies of assignments? If yes, why?
13. Would you be prepared to accept only digital copies of student assignments and mark on-screen? If not, why not?

Possible future strategies

14. Although important documents are available on the RU website, but some of the processes happen offline (hard copies required), e.g. application for admission at RU, online job application, etc. How open would RU be to the idea of a paperless office environment?
15. Has Rhodes University ever explored the use of digital platforms such as *Enterprise Document and Record Management Solutions* to manage the documents related to administration e.g. council, senate and committee agendas and minutes, leave application forms, online venue booking system, Email communication (as requirement) etc.
16. How do you feel about the potential of digital solutions such as an *Enterprise Document Management System* (EDMS) or *Google Drive* for managing the administrative functions of the University such as correspondence and meeting agendas and minutes?
17. What would you perceive as the potential enablers and potential obstacles for introducing the idea of a paperless office environment (e.g. through an EDMS or Google Drive) at Rhodes University?

Conclusion

18. Do you have any other comments or suggestions to make with regard to the sustainable use of paper at Rhodes University?

Thank you for your participation!

Appendix C: Online Questionnaires

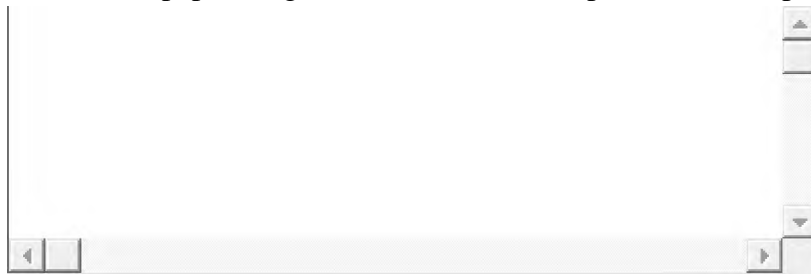**Appendix C.1   Environmental Representatives**

Survey of student perception and attitudes on paper usage at Rhodes University

Dear Environmental Representative I would like to invite you to participate in a survey about student perceptions and attitudes towards sustainable paper usage at Rhodes University. This survey aims to investigate student attitudes and perceptions that might promote or constrain sustainable paper usage in teaching, learning and other activities at Rhodes University. Kindly spare a few minutes to answer the following questions and stand a chance of winning airtime to the value of R30, for each 5th respondent. The closing date for this survey is Friday, 30 November 2012. This research, including ethical clearance, has been approved by the Commerce Faculty Higher Degrees Committee. The survey will maintain your confidentiality. A copy of the final research report will be made available upon request. You can withdraw from the research and/or request that your transcript not be used at any time until the submission of the dissertation. Ndumie Mfenyana MBA Student
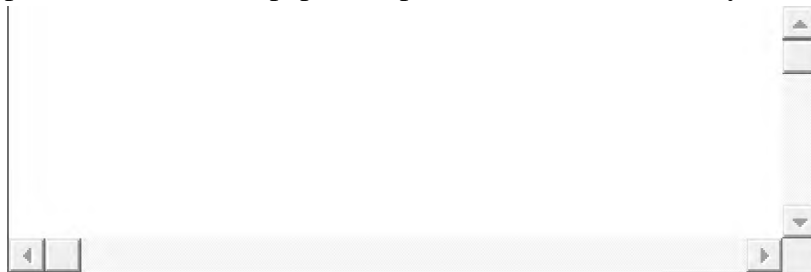* Required

Conditions that enable or constrain sustainable paper usage at Rhodes University

Sustainable paper usage What does the concept "sustainable paper usage" mean for you?

Awareness * What initiatives have you, in your capacity as Environmental Rep. introduced to promote sustainable paper use practices and how would you rate the success thereof.

University Initiatives To what extent did you participate and/or contribute to institution-wide initiatives aimed at paper recycling? Please also mention the extent to which you feel such

initiatives such as the two-bag system were successful or not.

[text input box]

Field of study To what extent has your attitude and perception on environmental sustainability been influenced by the courses that you took?

[text input box]

Contraints * Which of the following factors do you believe is most constraining of sustainable paper usage in your residence?

- ○ Lack of information and knowledge about paper usage and the environment
- ○ Students are just not interested
- ○ Lack of institutional support
- ○ Lack of positive role models who lead by example
- ○ Resistance to change
- ○ Other: [input box]

Enablements * Which factors at Rhodes University made it easy for you to promote sustainable paper usage in your residence?

[text input box]

University structures In executing your role as environmental rep, to what extent did you feel supported by University structures (e.g. the wardening staff, the SRC Environmental
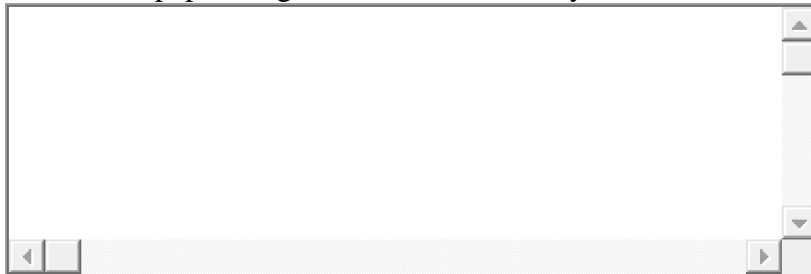
[text input box]

Councillor) ?

Academic communcation * What is your preferred way of communications related to your studies?

- Departmental notice board
- Email
- RUconnected
- Social media (e.g. Facebook)

Advertising * What is your preferred way of getting information about social and sport events?

- Posters on notice boards
- Email
- RUconnected
- Facebook
- Twitter

Recommendations * Do you have any recommendations to make that will promote sustainable paper usage at Rhodes University?

General Information

If you would like to participate in the lucky draw for airtime, please enter your name :

Cellphone number
Service Provider

- Vodacom
- MTN
- Cell C
- 8ta

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Appendix C.2   Departmental Office Administrators / Secretaries

Survey on the experience, perceptions and attitudes of administrative staff on paper usage at Rhodes University

Dear Office Administrator or Secretary I would like to invite you to participate in a survey about office administrator's experiences, attitudes and perceptions towards sustainable paper usage at Rhodes University. This survey aims to investigate attitudes and perceptions that might promote or constrain sustainable paper usage in teaching, learning and other activities at Rhodes University. Kindly spare a few minutes to answer the following questions and your response is highly valuable. This research, including ethical clearance, has been approved by the Commerce Faculty Higher Degrees Committee. The survey will maintain your confidentiality. A copy of the final research report will be made available upon request. You can withdraw from the research and/or request that your transcript not be used at any time until the submission of the dissertation. Ndumie Mfenyana MBA Student
* Required

Sustainable paper usage

What does the concept "sustainable paper usage" mean to your department?

Approximately what is the percentage of your staff that have desktop printers in their offices? *

Approximately what is the percentage of staff who print to a shared multi-functional device (MFD) in your department? *

How would you describe staff members experience and attitude towards the use of a multi-functional device (MFD) in your department? *

In your department, documents are mostly printed in: *

- Single sided A4 page
- Single sided A5 page (two A5 pages fits on one A4 sheet)
- Double sided A4 page
- sided A5 page
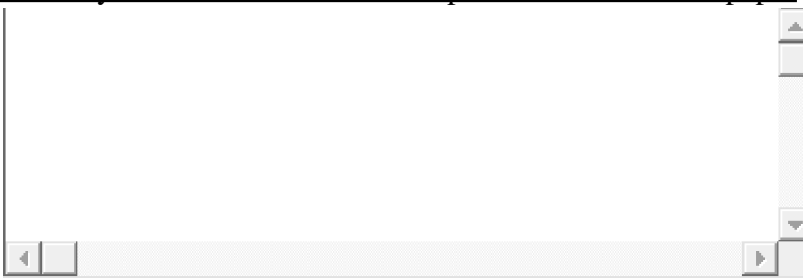-

Sustainability initiatives on paper usage

Awareness * What paper recycling and re-use initiatives do you have in your department and how would you rate the success thereof?

Constraints * The most common barrier towards sustainable paper usage in the department is

- Lack of information and knowledge about the link between sustainable paper usage and the environment
- Lack of participation and collaboration on initiatives to minimise paper usage
- Lack of financial support
- Resistance to change
- People do not care enough about the environment
- Other:

Enablers * What do you think could be done to promote reduction of paper usage in your

department? Administrative communication * Agenda's and minutes of departmental meetings are usually distributed to staff using

- Departmental notice board

- Email
- RUconnected
- Social media (e.g. facebook)
- Departmental website
- Hard copies
- Other:

Communication with colleagues * This is the most common way of corresponding between academics and their colleagues is:

- Email
- RUconnected
- Social media (e.g. facebook)
- Send letters
- Other:

Departmental communication with students * The most common way of corresponding between the department and students is

- Departmental notice board
- Email
- RUconnected
- Social media (e.g. facebook)
- Departmental website
- Send letters
- Other:

Academic communication with students * The most common way of correspondence between lecturers and students is

- Departmental notice board
- Email
- RUconnected
- Social media (e.g. facebook)
- Departmental website
- Send letters
- Other:

Recommendations * Do you have any recommendations to make for enhancing sustainable

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paper usage at RU?
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