The Use of Social Media as an Enabler to Create Environmental Awareness of Staff in Higher Education

Masive Zita[1], Clayton Burger[2], Brenda Scholtz[3]

Abstract

This paper examines the environmental awareness of staff members in a higher education institution through the use of social media and an environmental awareness campaign. The key question raised is whether the use of social media is an effective tool to run an environmental campaign to raise awareness and evaluate knowledge of the green initiatives that are happening with in the organisation as well as in popular media. The sample used for the campaign consists of academic, professional and support staff at the Nelson Mandela Metropolitan University which boasts an environmentally-friendly core value and has driven a significant amount of research in renewable energy, environmental management, estuarine protection and biodiversity protection, amongst other fields. The campaign was conducted through a centralised website which provided information about environmental management and challenges. The content was provided three times a week with the goal of raising awareness between the start of the campaign and the end, where knowledge interventions were performed to determine a difference in knowledge and social media usage for environmental awareness. The qualitative findings of the campaign through surveys and questionnaires indicate that, despite typical time restrictions, Facebook is the most effective social media platform used use to spread information and initiate "green practices". Participants indicated an increase of knowledge which was validated through assessment. Coupled with increased knowledge, participants indicated a positive attitude to the subject matter in encouraging them to play a role in the environment. This attitude is thus beneficial in a tertiary learning environment as educators can encourage students to be responsible custodians for the next generation.

Keywords: environment awareness, sustainable practices, social media

1. Introduction

There are many environmental issues that are increasingly becoming of concern to each country as well as to the global community [1]. There is thus societal pressure to create environmental awareness which is essential for informing people about the effects of global warming and other environmental hazards. Despite a finite amount of natural resources, pressure is placed on these resources through the rapid increase in the world's population which is amplified by the increase in average living standards and industrialisation. These issues have led to the concept of Earth Stewardship where individuals, as well as organisations, are responsible for being environmentally responsible and promoting sustainable practices [2].

The increase of environmental awareness has risen relatively in proportion to the demand for sustainable practices [3]. Environmental responsibility is accepted by United Nations Education, Science and Cultural Organisation (UNESCO) as each person's choice and basis towards

[1] Nelson Mandela Metropolitan University, Port Elizabeth, South Africa, Masive.Zita@nmmu.ac.za, Department of Computing Sciences

[2] Nelson Mandela Metropolitan University, Port Elizabeth, South Africa, Clayton.Burger2@nmmu.ac.za, Department of Computing Sciences

[3] Nelson Mandela Metropolitan University, Port Elizabeth, South Africa, Brenda. Scholtz@nmmu.ac.za, Department of Computing Sciences

sustainability [1], therefore the decision to mitigate waste, minimise reliance on fossil fuels and other environmental decisions and factors must be initiated at a personal level to affect change.

Education is the foundation for skills development, knowledge generation and personal development [4]. The education system is responsible for guiding the norms, values and attitudes of individuals to be global citizens, part of which is having respect for the natural environment. The higher education system, comprised of universities, colleges and training institution is also responsible for equipping students with skills and preparation for their trade [5]. Higher education institutions play a critical role in the development of their graduates, which can be coupled with environmental awareness and responsibility by encouraging educators and stakeholders to lead by example [6].

This paper investigates the usage of social media platforms by educational stakeholders in the Nelson Mandela Metropolitan University (NMMU) and analyses how these stakeholders interact within a digital campaign which aims to raise environmental awareness by means of social media. The context of environmental awareness and social media (Section 2) are critical for the creation of an informed campaign that supports social media platforms in raising environmental awareness. The methods employed in this study to construct, guide and study the campaign are outlined in Section 3. This is followed by a discussion of the results obtained (Section 4). Finally, recommendations for institutions and subsequent campaigns are outlined to provide a tangible contribution from the implemented campaign (Section 5).

2. Literature Review

2.1. Environmental Awareness, Attitudes and Action

The intention of environmental sustainability is to maintain and protect natural resources. There are three aspects to sustainability, namely: *knowledge*, *affect* and *behaviour* [7]. These individual aspects affect an individual's attitudes and manner of thinking towards the environment. A fundamental change in the way individuals think plays a key part in the realisation of sustainability, collectively referred to as an individual's mindset. The mindset of the individual motivates and guides others to play a role in the Earth's stewardship. The role of the mindset is a key driver in mitigating the effects of environmental issues.

Sustainability is traditionally supported by three pillars, namely the social, environmental and financial pillars. These pillars are applicable at both the personal and organisational level, but each pillar brings its own challenges and approaches to realising sustainability. Focusing on the environmental pillar of sustainability, two key concepts are critical, namely *awareness and environmental responsibility*. Awareness is defined as an introduction to informed action [1], while environmental awareness focuses on knowledge of the environmental concerns happening globally and how to positively impact these concerns. This concept extends to public awareness which helps individuals understand and drive other individuals to participate effectively in activities towards achieving sustainable practices [3]. A simple example of this concept is being aware of the natural cost of generating paper when printing a document. An environmentally aware individual will question whether the document should be printed. If the document must be printed, the individual will encourage the use of duplex printing to minimise paper usage, thus minimising the natural impact of the action. Individuals that are interacted with in this process are exposed to the rationale of minimising paper usage which thus drives environmental responsibility.

To produce sustainable practices, awareness must be coupled with existing environmental attitudes and exhibited behaviour while being affected by societal norms and values (Figure 1). Yahya and Hashim [8] observe that societal norms and values form an important context for strategies of

raising awareness of the natural environment. The existing attitudes that individuals have and their current behavioural patterns similarly contribute to how they adopt sustainable practices when exposed to public awareness initiatives, such as campaigns.

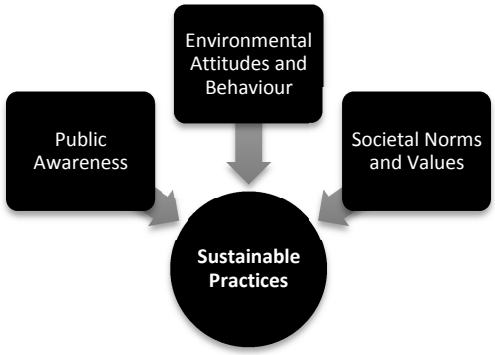

Figure 1: Framework for contributions to sustainable practices [3,8,9]

The key factor for the improvement of environmental awareness is the access to insightful and well-presented information [3, 9, 10]. Information is often packaged in communication campaigns that reach larger audiences [9]. Environmental awareness is seen as a component to the education process and helps with creating change [9]. The greater the number of aware and informed individuals; the more likely societies will take some form of action to affect environmental change. In higher educational institutions it has been proven that students have a basic awareness of environmental issues but are ignorant on strategies to address these issues [10].

2.2. Environmental Education

Various policies and international requirements, such as the King III report [11], have mandated that organisations not only focus on the financial bottom line, but on the triple bottom line principle of sustainability, thus also addressing social and environmental action [6]. There are two different types of opportunities for higher educational institutions in engaging in sustainable development according to the UNESCO [6]. The first opportunity is the direct transfer of knowledge while the second is societal development. Both strategies can be adopted by institutions to generate graduates with environmentally responsible attitudes and values by informing them of environmental issues together with a means of addressing these issues on various levels. Traditionally, higher educational institutions bear the responsibility of providing a tertiary education to students while providing leadership skills and support for resources to create sustainable practices in their environment [12].

Institutions appoint academics who serve to educate the students of institutions by sharing their knowledge in courses, assessing students and imparting cultural lessons in responsibility and leadership. This approach seeks to create students with responsibility and knowledge that are capable of becoming the leaders and experts of the next generation. This underpins the role that staff members of these institutions play, which forms a crucial context for the delivery of environmental awareness and responsibility in their students [10]. There are barriers in encouraging staff of higher educational institutions to impart environmental awareness to their students, specifically a lack of training, limited organisational support, limited resources, and cultural resistance. These issues cannot be isolated, so a unified approach to training and supporting these staff must be applied, such as through institutional policy and knowledge awareness campaigns.

2.3. Effectiveness of Social Media for Information Sharing

The term *social media* is defined as "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of user-generated content" [13]. There are a plethora of Internet services that can be classified as social media, with Facebook and Twitter being two of the most common platforms [9]. Twitter encourages word-of-mouth and discussion through short messages which are tied to events and/or people. Facebook encourages social networking and accessing of aggregated social network information through a personalised dashboard. Facebook provides the facilities for users to share content to their network of contacts of various types of content, such as text, links, images and videos. Conversely, Twitter provides limited facilities for sending short messages and embedding images [14].

Social media platforms have been shown to be effective tools to communicate and support interaction[14]. To determine the effectiveness of a platform, or proliferation of specific content, various measuring tools have been developed, such as Google Analytics, Sprout Social and social media tracking buttons (Figure 2). These tools help monitor and assess the usage of the social media networks. When assessing campaigns that are driven by social media, these services provide key insights, such as Facebook *likes* and *shares* and Twitter *tweets*, *retweets* and *followers* [14]. Social Sprout allows the analysis of demographics of geographically distributed content, while social media tracking buttons provide an aggregated summary of social media interactions for a specific piece of content. Finally, Google Analytics tracks the number of unique visits to external content from social media sources.

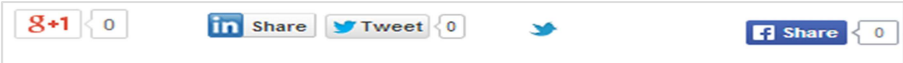

Figure 2: Example of a social media tracking button bar including one-click-sharing and tracking on Google Plus, LinkedIn, Twitter, and Facebook

3. Research Methodology

This study investigates a social media driven campaign for raising awareness of environmental issues at the NMMU. The campaign was conducted over a period of six weeks using an action research approach to providing content to participants. As the focus of the campaign was to raise awareness in a higher education context, a purposive sample was employed to attract participants that are currently employed by the institution. In addition to the initial sample (n=12), participants were encouraged to share information from the centralised project website which would expose the content to additional participants for the continuous response surveys, which was done through an informal snowball sampling approach. The sample included academic, professional and support staff from the spectrum of departments at the institution, drawing from Computing Sciences, Engineering, Student Governance, Media Studies, Journalism, Mathematics, Development Studies, Finance and Examinations departments.

The structure of the EcoSafe Campaign Model is illustrated in Figure 3. At the commencement of the campaign the *pre-campaign questionnaire* was administered to determine the social media usage and environmental awareness of participants prior to the commencement of the campaign. During the campaign, a *continuous feedback survey* was made available whereby participants could provide feedback about the campaign conduct and suggestions. Various *polls* were provided as part of the content to determine participation levels. Finally, *a post-campaign questionnaire* was provided to determine if the participants had shared the content provided through their social media networks, which networks were preferred and if their environmental awareness had been improved. A limited number of *semi-structured interviews* were conducted with participants to discuss the

campaign structure and content at the end of the campaign. All data gathered was anonymous to protect the identities of participants. Similarly, the actual proliferation of the content was not measured as this pose an ethical issue to the participants as their social media profiles would need to be tracked.

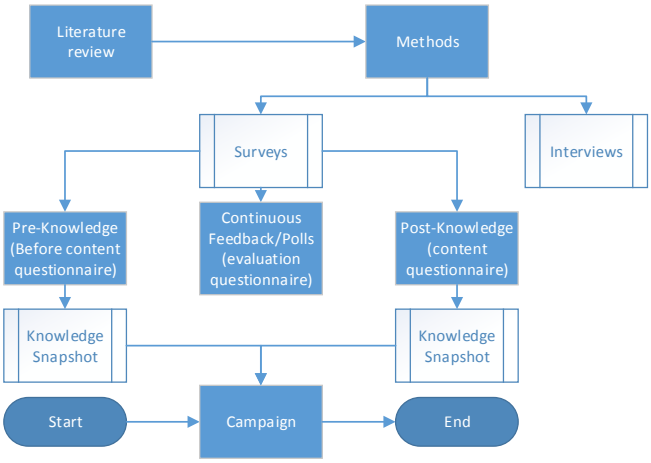

Figure 3: EcoSafe Campaign Model

The campaign was driven through shareable content that was posted on the central campaign website three times weekly. Participants were required to visit the website regularly to ensure exposure to the provided content. All content was peer-reviewed prior to posting to ensure relevance to the campaign and accuracy of content.

Examples of some of the posted content themes are:

1) NMMU sustainability initiatives and projects, such as renewable energy initiatives;
2) Recycling facts and tips; and
3) Popular sustainability initiatives, such as Earth Hour.

4. Analysis of Results

4.1. Participant Profile

The sample was drawn from employees at the NMMU and consisted of twelve monitored participants. Additional participants engaged with the content throughout the campaign, but their awareness and social media usage was not monitored. The length of employment for most participations (n=7) was considered short as the typical length was between one and five years which could suggest limited knowledge of the institutions environmental initiatives. The age distribution and gender distribution (Figure 4) indicate a roughly even distribution of age groups but a skewed gender sample of female participants.

4.2. Awareness Assessment

To determine the level of awareness of participants before and after the campaign, a *pre-campaign questionnaire* and *post-campaign questionnaire* was administered to each participant. The questions focused on general environmental awareness as well as awareness of institutional specific environmental initiatives. Examples of some of the multiple-choice questions posed are: *"What different types of environmental policies can be employed by companies?" "Which NMMU Campus is known as the Green Campus?"; "Which diseases can indoor pollution cause?"* Examples of

participant responses include *"Developing an environmental policy statement"*, *"George Campus"*, and *"Lung Cancer"*.

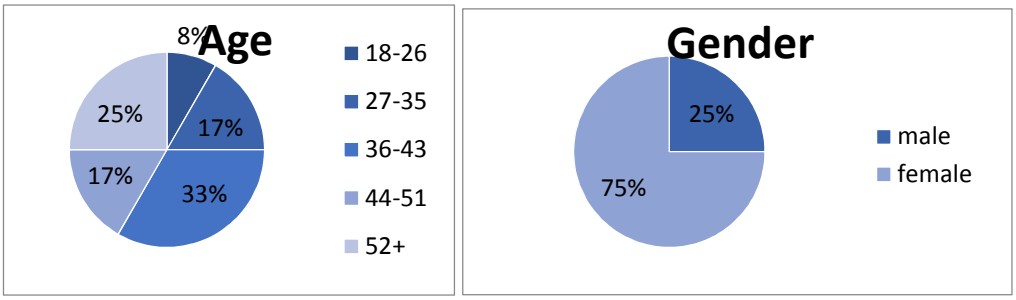

Figure 4: Gender and age distributions of participants (n=10)

A total of 17 questions were presented in each of the awareness questionnaires posed. The comparative results (Figure 5) indicate an increase in awareness overall of 27.4% over the course of the campaign.

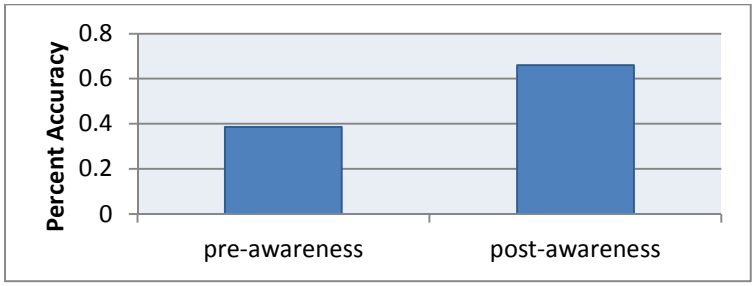

Figure 5: Assessment of environmental awareness before and after the campaign

Throughout the course of the campaign, participants were requested to complete *continuous feedback surveys* and *polls*. The role of the continuous feedback surveys was to assess the awareness gradient over the course of the campaign. Examples of questions that were presented in the surveys include:

1) What are some of the ways to save electricity at university?
2) Which sources of energy and electricity is renewable (if harvested)?
3) What actions are you willing to take to reduce global warming? Please describe.

Some of the questions posed were multiple-choice and some were open-ended to gain some insight into the perceptions of participants. Three continuous feedback surveys were presented over the course of the campaign. These surveys were informally assessed to determine if the participants were engaging with the subject matter provided on the campaign website. The general observation made is that participants were more aware of global environmental issues than of the NMMU's environmental initiatives.

The open ended questions asked on the surveys allowed the researcher to change the type of content published to align with the media that the participants preferred the most. The participants indicated that they prefer fresher content comprised of current topics and visual media, such as images and video. Examples of some of the quotes from participants are: *"To see the new discussed topics on Ecological factors."*, *"To see the different content, such as the videos"*, and *"To be kept informed"*. The participants indicated that they were surprised at many of the statistics shown on the website and that they had gained an appreciation of topical environmental factors, such as rhino poaching in South Africa. Using the informally scored surveys of the evaluation of content, a difference from 13% to 70% can be noted for the participants' awareness of institutional

initiatives, which serves to highlight that the campaign successfully emphasised the existence of these initiatives.

Semi-structured interviews were conducted with three of the participants to determine their reactions to the campaign. The prevailing opinion voiced by the participants was that both the environmental and NMMU content was relevant and interesting, but that there was not an institutional culture for sustainability. They emphasised the manner in which they would share some of their environmental responsibilities and values with their students in order to strengthen the graduate profile of the students while encouraging Earth stewardship.

Participants indicated that to instil and create sustainable development, as an organisation more sustainability awareness was needed, training and responsive action taken. Examples of direct quotes from participants are: *"Modernise the campus by raising finance to make the infrastructure more sustainable and construct new infrastructure to reduce car use (inter campus shared transport options); bonus schemes for departments that eliminate waste"*, and *"Have a professional lecture/presentation on a topic about environmentally friendly systems and activities which would lead to promoting ecologic platforms and systems."*

4.3. Social Media Usage and Proliferation

A *social media usage questionnaire* was administered to all participants. The questionnaire contained questions on which social media platforms were used by each participant and how they accessed the platforms. The participants were given a set of options for the some of the most widely used social media platforms to indicate their preference. The distribution of social media platform usage (Figure 6) indicates that Facebook is the most popular platform used by the participants for the campaign with all participants indicating at least "neutral" with 80% indicating "agree" or "strongly agree". The least popular platforms considered by the participants are Instagram, Blogs and Twitter.

The participants were asked how much time they spend on their preferred social media platform and what hampers their access to the platform. The majority of the participants (n=7) indicated that they spend between one and two hours daily on their platform to network with peers and engage with media. The constraints to usage of social media platforms listed were time (43%), Internet access (35%) and knowledge (22%).

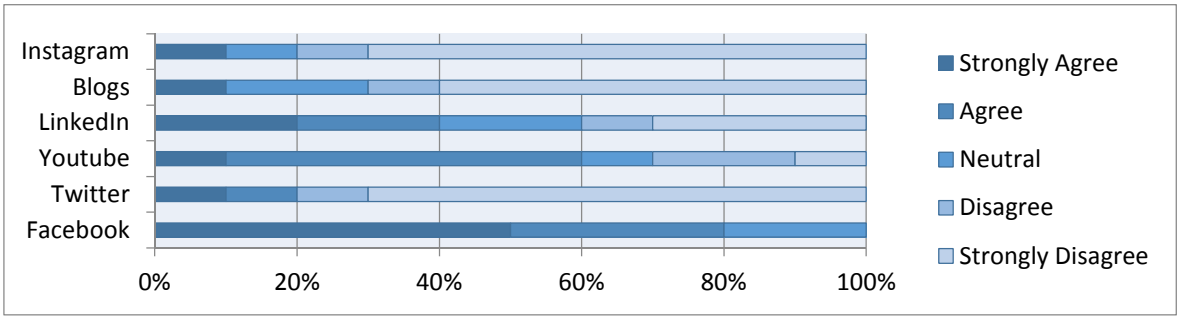

Figure 6: Social media platform preferences. Strongly agree indicates that the social media platform is preferred

The sharing analytics gathered during the website indicates that there was a mean of 82 hits per day throughout the course of the campaign. Many of these hits could be due to external search engine hits or web crawlers, but many were from IP addresses that belong to the institution. Through the semi-structured interviews, the three participants interviewed indicated that they regularly shared content that appeared in the campaign with the social network of peers when they felt that it would

be appreciated by their peers. The most popular shared content amongst the interviewees was video content as it can be easily accessed.

5. Recommendations and Conclusion

The results of this study suggest that the staff participants of the higher educational institution used in the study felt that they benefited from the campaign and that they had engaged with the content provided. There was an increase evident in the environmental awareness of the participants. Key findings indicate that institutions, such as the university investigated, should invest marketing efforts into their environmental initiatives, while endeavoring to make them accessible to as many staff members in these institutions that are not aware. This is a shortcoming as these initiatives can assist in drawing in student numbers and staff that are aware of them and can foster environmental values into their students. The limitation of this study is in the small sample size. However, it is a qualitative study which forms part of a larger, ongoing study. In spite of this limitation, the theoretical model proposed and initial findings provide a valuable contribution to the research field of environmental awareness and the use of social media for promoting these campaigns. Social media were shown to be a valid means of conducting an environmental awareness campaign but would need governance to maintain momentum, much like the action research approach employed in this study. Future research is required which could implement the model in other educational institutions in order to provide further empirical evidence.

6. References

[1] UNESCO, "United Nations Educational, Scientific and Cultural Organisation educating for a sustainable future," 1997. [Online]. Available: http://www.unesco.org [Accessed: 22-Jun-2014].

[2] M. A. Haşıloğlu, P. U. Keleş, and S. Aydın, "Examining environmental awareness of students from 6th, 7th and 8th classes with respect to several variables: 'sample of Agri city,'" *Procedia - Soc. Behav. Sci.*, vol. 28, pp. 1053–1060, Jan. 2011.

[3] D. L. Gadenne, J. Kennedy, and C. McKeiver, "An Empirical Study of Environmental Awareness and Practices in SMEs," *J. Bus. Ethics*, vol. 84, no. 1, pp. 45–63, Feb. 2008.

[4] J. W. Pellegrino, M. L. Hilton, and D. D. Learning, *Education for Life and Work : Developing Transferable Knowledge and Skills in the 21 st Century*. 2012.

[5] P. L. Tree, "Why Environmental Education is Important," *Washington*, 2010. [Online]. Available: https://www.plt.org/why-environmental-education-is-important. [Accessed: 22-Jun-2014].

[6] A. D. Johnston, "Higher Education For Sustainable Development," October 2006, pp. 1–62, 2007.

[7] N. R. Weber, J. Strobel, M. a. Dyehouse, C. Harris, R. David, J. Fang, and I. Hua, "First-Year Students' Environmental Awareness and Understanding of Environmental Sustainability Through a Life Cycle Assessment Module," *J. Eng. Educ.*, vol. 103, no. 1, pp. 154–181, Jan. 2014.

[8] W. K. Yahya and N. H. Hashim, "The Role of Public Awareness and Government Regulations in Stimulating Sustainable Consumption of Malaysian Consumers," vol. 2010, no. 2, pp. 105–108, 2011.

[9] C. Staff, "Environmental Awareness, Education and Training Strategy Table of contents," white paper, August, 2011.

[10] I. Thomas, "Sustainability in tertiary curricula: what is stopping it happening?," *Int. J. Sustain. High. Educ.*, vol. 5, no. 1, pp. 33–47, 2004.

[11] J. Hough, A. Thompson, A. Strickland, and J. Gamble, *Crafting and Executing Strategy: Creating sustainable high performance in South Africa: Text, readings and cases*, 2nd ed. Berkshire:McGraw-Hill, 2011, pp. 1–351.

[12] A. Nicolaides, "The implementation of environmental management towards sustainable universities and education for sustainable development as an ethical imperative," *Int. J. Sustain. High. Educ.*, vol. 7, no. 4, pp. 414–424, 2006.

[13] A. M. Kaplan and M. Haenlein, "Users of the world, unite! The challenges and opportunities of Social Media," *Bus. Horiz.*, vol. 53, no. 1, pp. 59–68, Jan. 2010.

[14] L. N. Tobey and M. M. Manore, "Social media and nutrition education: the food hero experience.," *J. Nutr. Educ. Behav.*, vol. 46, no. 2, pp. 128–33, 2014.