

**CO-CREATION ONLINE: THE POTENTIAL OF WEB 2.0 TOOLS TO ENABLE IT AND  
IMPACT USAGE**

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## Abstract

There is little in the existing literature that provides practical information on the link between co-creation and the internet as well as guidance on how to facilitate co-creation in the online environment. This study sought to address these gaps and particularly the lack of guidance on the practical act of co-creation and the relationship between co-creation and the online environment.

A quantitative research methodology with a descriptive design was followed. The data for the study was collected by way of an internet survey. The population for the research was defined as the users of the online cycling social network, [www.thehubsa.co.za](http://www.thehubsa.co.za). A topic explaining the purpose of the study and inviting users to participate was posted on the website.

The study revealed the existence of a new two factor solution related to the separate co-creation and Web 2.0 applications constructs. In this respect the Interact and Use components (co-creation) as well as the Creating and Sharing components (Web 2.0 applications) could provide the foundation for construct validity for more comprehensive scales.

The ability of a user to Author content on a website was found to be of particular practical importance in facilitating co-creation. Providing this functionality to a customer may be the key to the missing “how to” element of online co-creation. The ability of a social networking website, such as [www.thehubsa.co.za](http://www.thehubsa.co.za), to encourage general product/service usage appears to be the main attraction to advertisers. Advertisers looking to build their brands may not necessarily obtain the same benefits from the website. Findings regarding impact on usage were inconclusive and further research is suggested.

## **Keywords**

Online co-creation; Web 2.0 tools; user-generated content; social networking

## Declaration

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

The name and the original signature of the student and the date should follow the declaration.

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Gareth Rees

10 November 2010

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*To my supervisor – Kerry Chipp:* Kerry, thank-you for all your coaching and coaxing! I eventually made it to the stadium. Thanks.

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## Chapter 1 – Introduction

The increasing importance of providing customers with an experience, as opposed to just a product or service, has led to the development of what Pine and Gilmore (1998) called the experience economy. In the new experience economy the onus has shifted to the creation of value by staging experiences that involve customers. An organisation's ability to involve customers in the value creation process, and in so doing allow them to co-create the product or service, has become the new source of competitive advantage (Prahalad and Ramaswamy, 2004).

The explosive growth of the internet, as well as the radical changes that it presents to the traditional marketing approaches, is set to transform the way in which customers are encouraged to co-create. Novak, Hoffman and Yung (2000) confirmed how the interactive capabilities of the internet have transformed the concept of the customer experience and created an environment in which the online customer experience is paramount. The internet is ideally suited to co-creation by virtue of its multimedia capabilities, the applications it enables as well as its suitability to the creation of online communities.

Against the backdrop of the emerging importance of both the concept of co-creation as well as the internet's ability to facilitate the co-creation process, there is little in the existing literature that provides practical information on the link between co-creation and the internet as well as guidance on how to co-create. Prahalad and Ramaswamy (2004) developed a theoretical model of the building blocks necessary to facilitate a co-

creation environment, however, additional practical guidance on the topic of co-creation does not appear in a review of the literature.

This study sought to address the gaps noted above and particularly the lack of guidance on the practical act of co-creation and the relationship between co-creation and the online environment.

### **1.1. Research problem and objectives**

The purpose of the study was to address the practical considerations related to establishing an online environment for co-creation. This involved both understanding what constitutes online co-creation as well as what Web 2.0 tools are necessary in order for co-creation to take place. The marketing benefits of online co-creation were also considered as part of the study.

The main objectives of the research were as follows:

- To create a practical definition for co-creation
- To determine which Web 2.0 tools have the biggest influence on co-creation
- To establish the relationship between co-creation and product/service usage
- To establish the relationship between co-creation and brand usage.

The research problem was concerned with providing an answer to the “how to” element of co-creation that appeared to be lacking in the existing literature. The link to the research objectives is established through the stated purpose of arriving at a practical definition for co-creation that involved determining which Web 2.0 tools have the biggest

influence on co-creation as well as the commercial consequences of a co-creation strategy.

## **1.2. Research scope**

### The concept of co-creation

Prahalad and Ramaswamy (2004) defined co-creation as the interaction between the firm and the consumer that results in value creation. The nature of the actual interaction is not specified and may take different forms depending on the type of co-creation relationship. The co-creation that was studied as part of this paper was facilitated by means of a website ([www.thehubsa.co.za](http://www.thehubsa.co.za)) that provides certain tools to members and guests that allow them the opportunity to contribute content. In this respect, co-creation for the purpose of this study involved the online sharing of information and content as opposed to the customised development of a product or service.

### Online environment

The online environment that formed the basis of this study was a website hosted in South Africa and mainly used by South African cyclists. The Web 2.0 tools and website functionality was therefore limited to that generally available in South Africa. In addition the website content was specific to a community of cyclists and the information that they are likely to share. This shared information included reports and reviews, comments, photos, and links.

## Cycling community

The scope of the study was limited to co-creation within an online community of cyclists. In this respect the focus was on a specific form of co-creation and may not be appropriate for a consideration of other co-creation environments.

### **1.3. Research motivation**

#### Enacting co-creation

The literature reviewed revealed very little practical guidance on how to actually implement a co-creation strategy. Reports on the topic are predominantly focussed on the importance of co-creation (Prahalad and Ramaswamy, 2000); the need to create a customer experience (Pine and Gilmore, 1998); and the process of co-creation (Payne, Storbacka and Frow, 2008). The work of Prahalad and Ramaswamy (2004) came closest to providing practical advice through the development of building blocks of interactions between the firm and customers that are necessary for the process of co-creation.

The opportunity therefore arose to make use of the theoretical knowledge that existed on the topic of co-creation and use this to build practical insights. The current study was performed on a website that provides a social network for cyclists to interact and share information based on the view that co-creation was currently taking place in this environment. This allowed for a consideration of the activities that constituted co-creation as well as the Web 2.0 tools that facilitated the process.

## The impact of co-creation on usage

The findings of Okleshen and Grossbart (1998) confirmed that consumers that are active participants in online groups feel a stronger sense of membership and were more likely to place increased value on group information and act on this information. Their work established the indirect link between online membership perception and consumer behavioural changes (Okleshen and Grossbart, 1998). Research by Jae, Choi, Qualls and Han (2008) examined the impact of online communities on brand commitment and subsequent customer behaviour. The findings suggested that online community commitment had a direct influence on brand commitment and that customers that are members of online communities have a stronger brand commitment than those that are not (Jae et al, 2008). Further research by Lesser and Fontaine (2002) reaffirmed the fact that online communities allow companies to learn more about their customers as well as attract repeat visits to their websites.

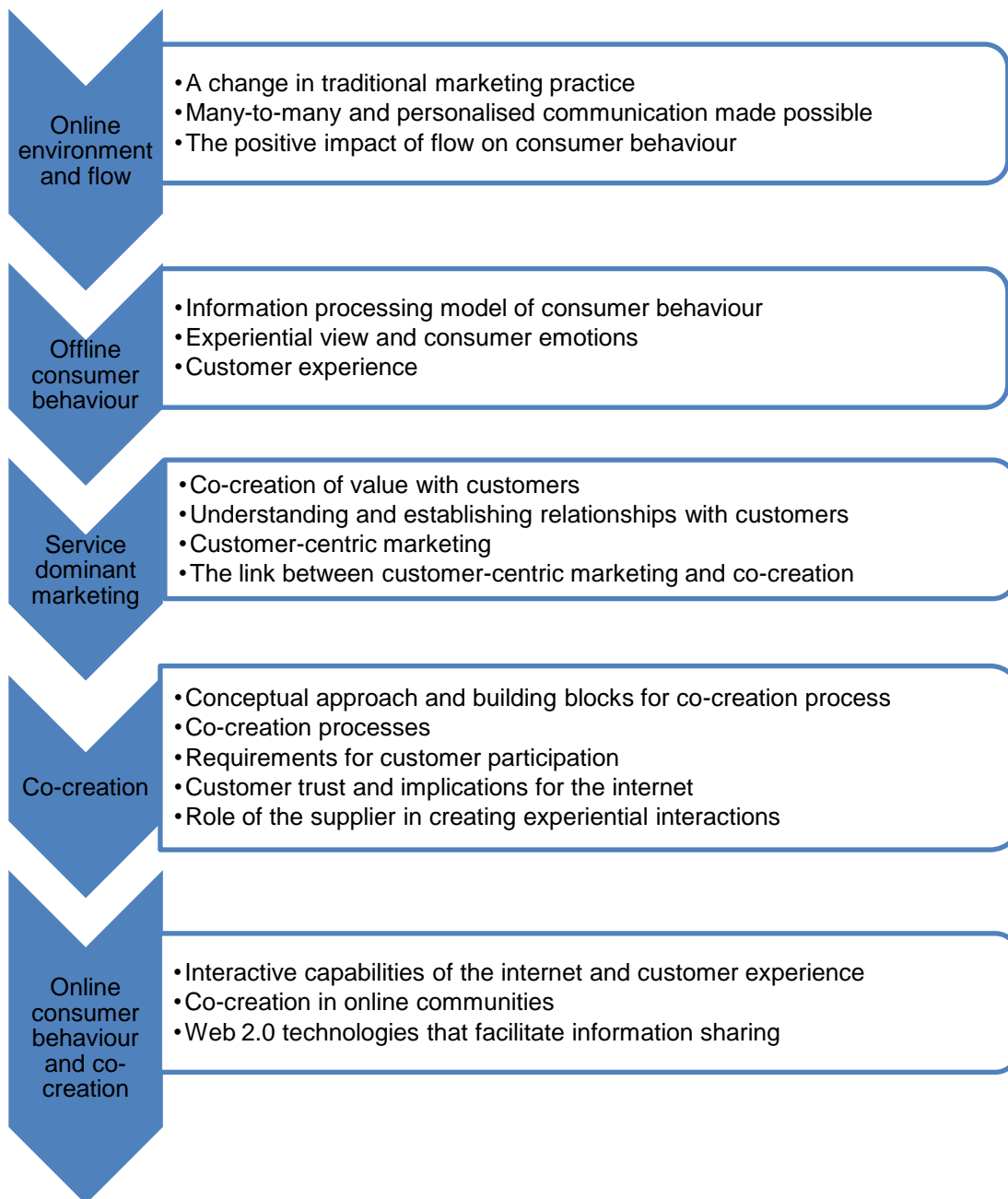
There appeared to be a substantial body of work on the formation and benefits of establishing online communities. The resulting benefits related to the positive impact on website usage as well as product/service and brand usage. The impact of a co-creation process and the links to the establishment of an online community were not covered by the existing research. This gap in the research motivated the current study and specifically the objectives related to a better understanding of the relationship between co-creation and usage (measured by website usage, product/service usage and brand usage).



## Chapter 2 – Literature review

The following framework provides a structure for the literature that has been reviewed in this chapter.

**Figure 2.1: Structure for the literature review**



## **2.1. The online environment and the concept of flow**

Hoffman and Novak (1996) realised the importance of the internet at an early stage and specifically the implications that it would have on the traditional marketing approach. The initial work of Hoffman and Novak (1996) on the concept of flow in hypermedia computer-mediated environments (CMEs) was in recognition of the fact that traditional marketing practice was no longer appropriate in environments such as the World Wide Web. Traditional marketing media is characterized by a passive one-to-many communication model whereas the World Wide Web provides the ability to communicate on an interactive many-to-many basis as well as on a personalized basis.

The Hoffman and Novak (1996) paper described flow as an enjoyable and desirable state that consumers seek to achieve. A conceptual model of flow was developed and determined the variables that cause a consumer to enter into a flow state while interacting on the internet. The primary antecedents of flow were found to be skills and challenges which need to be matched and above a particular threshold level as well as the presence of focused attention (Hoffman and Novak, 1996). The two secondary antecedents that were considered to enhance, but not induce flow, were interactivity and telepresence (Hoffman and Novak, 1996). By understanding the variables that resulted in the flow state being achieved, marketers gained an insight into how to induce flow and thereby increase consumption.

The structural model of Novak, Hoffman and Yung (2000) built on the earlier conceptual model and allows for the extent of the appeal of an online experience to be defined and measured as well as related to important marketing variables. One of the key findings in relation to consumer behaviour and web usage was that flow and closely related

constructs was greater for respondents who use the Web for experiential uses such as online chat and entertainment compared to task orientated uses like work and performing searches (Novak et al, 2000).

A later paper by Novak, Hoffman and Duhachek (2003) considered whether flow occurs during both experiential and goal directed activities. In contradiction to their early work, they found more evidence for flow occurring in relation to goal oriented than experiential activities (Novak et al, 2003). The quality of the flow experience can therefore be said to be dependent on the active engagement of the consumer as well as the type of activity i.e. experiential or goal directed. The authors note the importance of further research into the role that goal-directed and experiential activities play in creating a compelling online consumer experience.

Regardless of whether the online customer activities are experiential or goal directed, the importance of the online environment as an effective marketing medium cannot be ignored. An integral part of the online marketing offering is the ability to get closer to and intimately understand the customer.

## **2.2. Offline consumer behaviour**

### **2.2.1. Rational choice and the information processing model of consumer behaviour**

Consumer behaviour was initially considered based on the micro-economic concept of rational choice in which consumers were studied on the basis of decision making as a result of reason and judgement. Some effort was given to the study of the irrational buying needs of consumers, but this ultimately gave way to models of bounded rationality in which rational decisions are made based on an individual consumer's

perception of reality. Models of bounded rationality extended the understanding of consumer behaviour and ultimately led to the introduction of the information processing model (Holbrook and Hirschman, 1982).

Bettman and Jones (1972) considered the emergence of the information processing model and noted that, under this model, consumers receive information from an environment and are required to process the information in order to make choices. The information processing model views consumers as logical thinkers that make decisions in order to solve problems (Holbrook and Hirschman, 1982). Consumer research under the information processing model was therefore most interested in the choice process and how this resulted in purchase decisions (Holbrook and Hirschman, 1982). As choices were largely dependent on brands, brand purchase decisions were considered to be an important behavioural outcome under the information processing model (Holbrook and Hirschman, 1982).

### **2.2.2. The experiential aspects of consumption**

The experiential view of Holbrook and Hirschman (1982) recognised the subjective nature of consumption that involves various emotional states. A simple consideration of the information processing view is thought to only account for a small part of what constitutes the entire customer experience and ignores the pursuit of fantasies, feelings and fun (Holbrook and Hirschman, 1982). In considering the concept of customer delight (and how this differs to customer satisfaction), Oliver and Rust (1997) noted that there is an increasing realisation on the part of manufacturers that the product only represents a small part of the overall service provided to customers.

The consumption experience is a result of the actual consumption or use of products or services. Under the information processing view of consumer behaviour, the consumer is concerned with the tangible benefits that result from utilitarian functions (Holbrook and Hirschman, 1982). The experiential perspective is more subjective and based on the emotions as well as fantasies, feelings and fun that are invoked (Holbrook and Hirschman, 1982).

A paper by Berry, Carbone and Haeckel (2002) on managing the total customer experience provided further support for customer value not being a simple trade-off between functionality and price. Value is created for customers by providing experiences that involve more than simply entertaining customers or being creative. In order to provide a truly memorable experience it is necessary for companies to understand and establish a relationship with their customers (Berry et al, 2002). There are a number of clues that make up the customer experience and these include anything that can be perceived or sensed by the customer based on the actual product or service, the physical setting or store location as well as the company employees (Berry et al, 2002). It follows that although part of the customer experience is dependent on the actual functioning of the good or service, the extent of the emotions that the good or service invokes as well as the environment in which it is offered are equally as important.

It was Hoch (2002), however, that wrote about the seductive nature of product experience that leads customers to believe that they learn more from the experience than they actually do. Hoch (2002) suggested that experience is better than formal education due to the experience being more engaging and vivid, less partisan and

therefore less subject to manipulation or influence, ambiguous and open to different interpretations and endogenous meaning that the experience allows for the consumer to modify and make changes in tastes. The significance of this work was not to support the notion of cognitive dissonance and how consumers tend to rationalise choices, but to establish that consumers can alter their enjoyment of an experience by the development of expertise. The importance of the seductive nature of the product experience was found to have an impact on the consumer's expertise, as a result of their personal perception of the experience, and ultimately their impression of the product. The findings of Hoch (2002) again highlighted the importance of the customer experience and the direct impact that this has on the product or service being offered.

As marketers began to realise the importance of the customer experience this led to the focus on managing the customer experience in order to build relationships with customers and establish loyalty. The reality per Frow and Payne (2007), however, is that few companies understand the true meaning of customer experience and what needs to be done to deliver a superior customer experience. Frow and Payne (2007) noted that service quality and customer satisfaction are actually declining and for this reason it is paramount to establish what constitutes the "perfect customer experience". The lessons developed from the cases studied in the research of Frow and Payne (2007) highlighted the importance of co-creation, involving the active participation of the customer, in creating "the perfect customer experience".

The research detailed above supports the current trend towards creating customer experiences in conjunction with products and services. The creation of a meaningful experience (possibly in search of the "perfect customer experience") is based on

establishing a personal relationship with the consumer in order to fully understand their needs. This should be considered in light of the statement made by Novak et al (2000) that the internet should not be thought of as a substitute for the real world, but as an alternative to the real world in which online customer experience plays a major role. The internet has a significant role to play in developing and managing customer experiences and may not currently be effectively utilised in this context.

### **2.3. Service-dominant marketing**

Vargo and Lusch (2004) emphasised the need to move from a goods-dominant view of marketing, in which the main objective is to make and sell goods, to a service-dominant view characterised by the exchange of competencies and the co-creation of value with consumers. The discipline of marketing has slowly evolved from the functional view of what needed to be done to facilitate the exchange of goods and services to the marketing management model that characterised marketing as a decision-making activity that was necessary in order to satisfy the customer (Vargo and Lusch, 2004). Service-dominant marketing led marketers to consider the importance of the customer and establishing relationships with the customer (Vargo and Lusch, 2004). What followed, according to Vargo and Lusch, (2004) was a focus on relationship management and the emergence of service marketing. The service-dominant view of marketing is based on exchange processes and relationships and resulted in a move away from the goods-dominant view in which product exchange was central. Service-dominant marketing is seen as a social and relational process that involves understanding the customer's needs and how best to serve the customer.

The service-dominant view is supported by eight foundational premises and includes the principle that the customer is always a co-producer (Vargo and Lusch, 2004). The service provided is to ensure a customised product by involving the customer in the production of value. This customer involvement ensures that goods become the vessels that provide services for and in partnership with the customer (Vargo and Lusch, 2004). There is clearly a close link between experiential consumption (and the importance of creating a customer experience) and service-dominant marketing that emphasizes the need to customise offerings by involving the customer in the co-creation process. In fact it is pointless to try to create a customer experience without involving the customer in a process of co-creation.

### **2.3.1. The marketing evolution towards co-creation**

Customer-centric marketing has replaced earlier marketing strategies that involved product and segment-centric marketing (Sheth, Sisodia and Sharma, 2000). The focus on customers was based on the view that marketers needed to get closer to customers in order to anticipate their behaviour. The benefits of customer-centric marketing were established as being able to focus on profitable customers and, as a consequence, the focus of marketing changed from demand management to supply management (Sheth et al, 2000). Customer-centric marketing was found to be closely linked to co-creation marketing and Sheth et al (2000) foresaw a closer level of interaction between production (supplier) and consumption (customer) and noted that the internet will serve as a key platform for this interaction. Understanding and interpreting individual consumer needs and wants, and not those of a mass market, is the cornerstone of customer-centric marketing. Customers are required to play an increasing role in the



fulfilment process (Sheth et al, 2000) in order to facilitate the collaboration between supplier and customer through the process of co-creation.

The concept of co-creation by customers has put the customer back in control as the ultimate decision maker with respect to value. This change has been supported by advances in technology, and specifically the internet, that has led to increased access to information as well as the opportunity for consumers to communicate directly with each other regardless of location. The impact for suppliers is that consumers can now choose the companies that they interact with based on personal views of how value is created (Prahalad and Ramaswamy, 2004). The firm is no longer viewed as trying to please the customer and the focus is on connecting the customer to the firm's offerings (Prahalad and Ramaswamy, 2004).

There are, however, some inherent dangers in the co-creation process. Bendapudi and Leone (2003) studied customers' potential psychological responses to the co-creation process and documented some interesting findings. The authors note that customers that participate in a co-creation process are subject to the self-serving bias meaning that they take more credit for positive outcomes and less credit for negative results. In addition they found that the tendency was reduced when customers had a choice to participate in a co-creation process or not (Bendapudi and Leone, 2003). Hilton (2008) highlighted another potential issue whereby a focus on increasing customer productivity in order to reduce costs can have the effect of reducing quality and the resultant customer experience. Her work in the self-service context noted the key difference between co-production, in which the performance of certain tasks is transferred to the

customer, and co-creation where customers co-create the value they obtain from the service experience.

#### **2.4. Enacting co-creation**

A lot has been written on co-creation, however, a review of the literature revealed very little practical guidance on how to actually implement a co-creation strategy and process. The majority of articles on the topic of co-creation are either focussed on the importance of adopting a co-creation strategy and the need to incorporate the customer experience into the business model (Prahalad and Ramaswamy, 2000) or the challenges involved in co-creation.

In answer to the question of how a co-creation system should be created, Prahalad and Ramaswamy (2004) developed the building blocks of interactions between the firm and customers that are necessary for the process of co-creation. The basis of interaction was found by Prahalad and Ramaswamy (2004) to come from dialogue, access, risk-benefits and transparency (DART). Dialogue forms the basis of the interaction between the firm and the customer and usually involves a conversation taking place. Both access and transparency were found to be necessary elements in order for the exchange of information to occur between both parties. The customer is then able to consider the risk-benefits and make a decision. The essence of the co-creation process is the company-customer interaction which results in the value creation (Prahalad and Ramaswamy, 2004) and occurs at all levels of interaction between the parties.

In developing a conceptual model for the co-creation of value, Payne, Storbacka and Frow (2008) recognised the importance of establishing processes in co-creation. Payne

et al (2008) developed a process-based value co-creation framework that was made up of the three main components:

- Customer value-creating processes – refer to the practices which customers use to manage their activities.
- Supplier value-creating processes – used by the supplier to manage its business and relationship with customers.
- Encounter processes – govern the interaction and exchange that takes place between customers and suppliers.

Gurau (2009) extended the co-creation concept further by noting that value is embedded directly in the co-creation experience and stated that it is no longer attributable to products or services. His work stressed the flexibility required for such a marketing system based on the participative nature of the interactions with customers.

#### **2.4.1. The role of the customer in co-creation**

The traditional role of the customer as a passive buyer and consumer has changed and customers are now considered as part of the enhanced network of companies (Prahalad and Ramaswamy, 2000). Customers are increasingly viewed as a source of competence that is necessary in order to establish a competitive advantage. The reality, however, is that customers must also be regarded as competitors (Prahalad and Ramaswamy, 2000). This is due to the increasing popularity of the internet that has resulted in both customers and companies having equal access to information (Prahalad and Ramaswamy, 2000). The extent of information available to customers has led to increased power on their part as they now have the ability to research the

options available to them and the prices that companies charge for a particular product or service. It is now not uncommon for customers to negotiate prices with suppliers and this has been recognised by the number of online auction sites that have been established so that customers can effectively set the price for a good or service.

Sawhney and Prandelli (2000) found that the following requirements are necessary in order for the customer to participate in the co-creation process:

- Customers must have an understanding of the firm and knowledge of the products or services it offers.
- Customers need to have a relationship of trust with the firm.
- There must be sufficient motivation for customers to take part in the co-creation process.

#### **2.4.2. Customer trust in the co-creation process**

Trust is a critical part of any means of exchange and is necessary due to the uncertainty in dealing with another party. As the internet facilitates an online exchange in which the identity of the supplier is even more uncertain, so the issue of trust becomes more important in the online setting. Hoffman, Novak and Peralta (1999) noted that there is a fundamental lack of faith between most businesses and consumers on the internet and that consumers do not sufficiently trust Web providers to engage in exchanges involving personal information or money. The reason for the lack of trust, per Hoffman et al (1999), is a result of online consumers feeling that they lack control over the access that online vendors have to their personal information.

Gounaris, Dimitriadis and Stathakopoulos (2005) produced a paper based on a consideration of the key drivers of e-service quality on the internet. The study showed that customer trust in a company was a significant factor in determining perceived e-service quality. The research conducted by Gounaris et al (2005) found that customer trust influences all four key dimensions of e-service quality being information, user friendliness, interaction / adaptation and aesthetics. The implication is that to have a positive effect on consumers' perception of e-service quality, online retailers should focus on building trust by paying attention to issues such as security and after-sales service.

A later study by Goode and Harris (2007) considered the online behavioural intentions of a group of consumers based on an experience with a particular website. The research tested a number of hypotheses and found that the perceived online reputation had the biggest impact on consumers' behavioural intentions. This result reaffirms the importance of reputation and trustworthiness in the e-commerce environment.

#### **2.4.3. The role of the supplier in co-creation**

Payne et al (2008) considered the role that the supplier has in managing the co-creation of value. The importance of the relationship between the supplier and customer highlights the need for customer learning whereby the supplier provides experiential interactions that assist customers in using their resources for the co-creation process (Payne et al, 2008). The supplier processes as outlined by Payne et al (2008) involved a review of co-creation opportunities followed by the planning, testing and prototyping of value co-creation opportunities. The final part of the process is dedicated to developing metrics in order to determine if the appropriate value propositions are being created.

## **2.5. Online consumer behaviour and co-creation**

Pine and Gilmore (1998) introduced the concept of the experience economy and noted that companies have moved from purely providing goods and services to consumers towards staging experiences. The level of participation of consumers in the experiences that are staged by companies determines the ultimate success of the experience and the competitive advantage that is established. The interactive capabilities of the internet have radically transformed the concept of creating a customer experience and resulted in it becoming an environment in which the online customer experience is paramount (Novak et al, 2000).

### **2.5.1. Co-creation in online communities**

The explosion of the internet as a communication tool is due to its multimedia capabilities as well as the number of applications that it enables e.g. email and the World Wide Web. As a marketing medium, the internet has made it possible to communicate to the masses as well as to engage in a personal conversation with specific customers. More importantly, and from a co-creation perspective, the internet has facilitated the creation of online communities.

The work of Fischer and Bristor (1996) studied the formation of communities based on consumption facilitated by the internet. In a traditional sense, communities are developed based on relationships which are considered necessary to provide some sort of companionship or support (Fischer and Bristor, 1996). Another school of thought, per Fischer and Bristor (1996), is that bonds - formed through things that people have in common - and experiences might be more important than relationships.

Fischer and Bristor (1996) regarded the communities formed on or supported by the internet to be consumption communities and included discussion groups, newsgroups and the World Wide Web. The main findings of their work was that internet consumption communities were uniquely liberating and empowering, but at the same time self-selective, voluntary in nature and easy to join and leave (Fischer and Bristor, 1996).

The view of the internet as a community has been thoroughly researched and specifically the argument that Usenet users, that make use of the distributed internet discussion system, form virtual communities (Okleshen and Grossbart, 1998). The findings of Okleshen and Grossbart (1998) confirmed that consumers that are active participants in Usenet groups (“posters” that post information and interact with other users) feel a stronger sense of membership than less active observers (“lurkers” that only observe). These active users (posters) were found to place more value on group information and were more likely to act on this information and in so doing affect behaviour (Okleshen and Grossbart, 1998). It was established that there is an indirect link between membership perception and behavioural changes (Okleshen and Grossbart, 1998) that is facilitated by the perceived value of the group information. The findings are in support of the unique capabilities that the internet presents as a means of co-creation. In addition the impact that the formation of online groups and communities has on consumer behaviour and the propensity to engage and spend presents unique opportunities for co-creation marketing. From a marketing perspective the challenge is to facilitate and encourage online consumers to become “posters” that are active participants that develop a strong membership bond. The strength of the

online bond, which is determined by the customer's involvement, is ultimately what impacts the success of an online community.

The case for the emerging importance of online communities is evident from the unprecedented popularity of social media groups such as Facebook, Twitter and YouTube. This is further supported by research and findings detailed in academic papers. Research by Jae, Choi, Qualls and Han (2008) examined the impact of online communities on brand commitment and subsequent customer behaviour. Their findings confirmed that online community commitment has a direct and key influence on brand commitment and that customers that are members of online communities have a stronger brand commitment than those that are not members (Jae et al, 2008). The implications are significant in that the creation of online communities is a means of building brand loyalty and encouraging consumption. However, successful online communities are dependent on stimulating consumer involvement which ultimately involves a meaningful co-creation process. The challenge then is how best to facilitate the online co-creation process.

The creation of online communities that bring together customers with common interest is beneficial to companies both from a point of view of learning more about their customers as well as a means of attracting repeat visits to their websites (Lesser and Fontaine, 2002). By listening to what customers are saying online, companies are able to use online communities to learn more about their customers and foster loyalty. Although the medium of customer communication i.e. the internet is new, the concept of customer-centric marketing is well established as documented earlier. In fact, the creation of online communities can be considered as a form of service-dominant



marketing that facilitates the co-creation process by actively engaging with the customer. It would make sense then to apply the traditional co-creation model in an online setting in order to maximise the benefits of an online community.

The literature reviewed with regards to the online setting provided guidance with respect to the nature of the activities that the customer seeks to accomplish, being goal directed and experiential, and the impact that these have on the flow experience. While there are findings to support favourable flow experiences for both activities it would seem that the degree of active customer engagement is ultimately what counts. This conclusion further underlines the need to research and to understand why the online environment is best suited to co-creation.

### **2.5.2. The technologies for online co-creation**

McAfee (2006) noted that digital platforms, referred to as Web 2.0 technologies, are already in existence on the Internet and allow for the generation and sharing of information and knowledge. In the context of the platforms available for companies to share the results and output of their knowledge work, McAfee (2006) made use of the term “Enterprise 2.0”. McAfee (2006) described the components of Enterprise 2.0 technologies in terms of the SLATES framework which consists of the following parts:

- Search – generally refers to the fact that the website has a keyword search function.
- Links – the website provides links between Web pages.
- Authoring – members are able to create and update posts on the website.
- Tags – members can categorise content using tags.

- Extensions – the website recommends content to individual users through a process of customisation to individual user needs.
- Signals – the website uses RSS (Really Simple Syndication) technology to notify members of content changes.

The literature reviewed on the specific topic of online consumer behaviour and co-creation has provided ample support for the benefits of establishing online communities. These benefits relate to the value of group information, the positive influence on brand commitment as well as the opportunities for companies to learn more about their customers and foster loyalty. In addition, the available Web 2.0 technologies have been discussed and are capable of supporting an environment in which information and content is shared. The challenge that remains is the integration of these two parts – co-creation in the online environment through the effective use of Web 2.0 technologies – in order to practically understand an approach to online co-creation.

## **2.6. Summary of literature review**

The existing literature set supported a considerable amount of work in the separate areas of the online environment and the concept of co-creation. The research on the online environment was dominated by references to the interactive nature of the internet and the role that it facilitates in creating customer experiences. Research into the actual Web 2.0 technologies confirmed the existence of the tools and infrastructure that are currently available to create these interactive customer experiences. A separate consideration of the growing importance of creating a customer experience revealed an abundance of literature on the concept of co-creation. Specifically the value added importance of co-creation has been studied in addition to the theoretical understanding

of co-creation as well as the processes required to co-create. The practical “how to” element of co-creation appeared to have largely been ignored in the literature. An opportunity therefore existed to study online co-creation with a view to arriving at a practical definition for co-creation. This research opportunity would involve determining which Web 2.0 tools have the biggest influence on co-creation as well as the commercial consequences of a co-creation strategy.

## Chapter 3 - Propositions

The objectives of this study were to create a practical definition for co-creation and to determine which Web 2.0 tools have the biggest influence on co-creation. Other aims were to establish the relationship between co-creation and product/service usage as well as the relationship between co-creation and brand usage. A review of the existing literature provided frameworks for both co-creation and Web 2.0 applications that were developed further in order to test the individual propositions that are listed below.

### Proposition 1:

Co-creation is present on the online cycling forum, [www.thehubsa.co.za](http://www.thehubsa.co.za)

### Proposition 2:

Different Web 2.0 applications available on [www.thehubsa.co.za](http://www.thehubsa.co.za) determine/correlate with the individual members' ability to co-create.

### Proposition 3:

Increased perceived co-creation on the site results in an increase in time spent on the site.

### Proposition 4a:

The ability to co-create fosters product/service usage.

### Proposition 4b:

The ability to co-create fosters brand usage.

## **Chapter 4 – Research methodology**

A deductive research approach was used in order to test the existing theory that has been set out in the literature review. Per Saunders, Lewis and Thornhill (2009) the deductive approach owes a great deal to the scientific approach and involves the development of a specific theory for testing. A quantitative research methodology was followed as both the data collection tool (questionnaire) and data analysis procedure made use of numerical data.

### **4.1. Research design**

The co-creation and online environment subject areas have individually been thoroughly researched to date, however, the review of the literature revealed that there is little research on online co-creation and the suitability of the online environment for the process of co-creation. As the research in each particular area is well understood, in spite of the apparent lack of work done on online co-creation, there was not much value to further exploratory research and accordingly this paper followed a descriptive approach.

As the purpose of the research was to test and establish relationships between variables, the research design was descriptive and took the form of a descriptive study. As outlined by Saunders, Lewis and Thornhill (2009) the emphasis will therefore be on quantifying a specific situation and the relationship between the variables of interest.

Zikmund (2003) defined descriptive research as that which is designed to describe characteristics of a population or phenomenon. The characteristics in this type of descriptive research are explained by establishing relationships. In this case, the

phenomenon related to the online website capabilities and the impact on co-creation as well as the knock-on effects on brand loyalty and use. Per Zikmund (2003) descriptive research is used to answer the who, what, when, where and how questions that are encompassed in the propositions stated above.

Zikmund (2003) also noted that descriptive research is conducted when there is some previous understanding of the nature of the research problem. The literature review detailed the existing literature and findings with regard to both the co-creation and online constructs.

#### **4.2. Unit of analysis**

The research of Novak, Hoffman and Yung (2000) was based on the perceived changes that the internet had on the traditional view of marketing and the need to understand consumer behaviour in this new environment. The online consumer making use of the internet was the unit of analysis for their work. Similarly, the unit of analysis for this study was the members of [www.thehubsa.co.za](http://www.thehubsa.co.za) (in the role of an online consumer).

#### **4.3. Population**

Population is defined by Saunders, Lewis and Thornhill (2009, p. 212) as “the full set of cases from which a sample is taken”. Following this definition, the population consists of the membership base of the online cycling website [www.thehubsa.co.za](http://www.thehubsa.co.za) that accessed the site in September 2010.

#### **4.4. Sampling method and size**

A non-probability sampling technique will be used which according to Saunders, Lewis and Thornhill (2009) has the following characteristics:

- There is an unknown probability of each case being selected from the population;  
and
- It is not possible to make statistical inferences about the population.

More specifically a convenience sampling method will be adopted in order to haphazardly select the cases that are easiest to obtain (Saunders, Lewis and Thornhill, 2009). It is noted that a disadvantage of using this sampling method is that it is “prone to bias and influences that are beyond your control” (Saunders, Lewis and Thornhill, 2009, p. 241) as a result of the researcher being in a position to select the individual cases. The advantage of using convenience sampling is that a large number of completed questionnaires can be obtained quickly and economically (Zikmund, 2003).

Based on an assumed realistic response rate of 2% for online questionnaires and a total of 11,000 respondents (current membership base of [www.thehubsa.co.za](http://www.thehubsa.co.za)), the goal was to elicit 220 responses at a minimum. Chipp and Ismail (2004) note, however, that internet surveys have to contend with the issue of sample control (which also impacts mail surveys) as there is no direct control over who completes the questionnaires as this is dependent on who operated the computer

There is also the issue of self-selection (or volunteer) bias in conducting internet surveys with the result that respondents are limited to those that are interested in the topic (Chipp and Ismail, 2004). Although this is considered to be desirable from the perspective of getting complete data it does, however, imply that the responses were primarily from those members of the website that had a particular interest in online co-

creation which could negatively impact the variability of the data. This could mean that the group of respondents is not necessarily representative of the population.

The choice of an internet-mediated questionnaire made use of the medium (the internet) in which consumer behaviour was being studied and was considered to be the most convenient way of reaching the population. From the perspective of resources available to the researcher, the choice of questionnaire was supported by the limited time available as well as the financial implications.

#### **4.5. Data gathering**

In the opinion of Saunders, Lewis and Thornhill (2009) questionnaires tend to be used for explanatory research as they involve standardised questions that are interpreted in the same way. The authors go on to mention that the design of a questionnaire is dependent on both how it is intended to be administered and the amount of contact that is expected with the respondent. The most appropriate questionnaire for use in this study was considered to be a self-administered questionnaire to be completed electronically using the internet (internet-mediated questionnaire). The advantages of conducting quantitative research over the internet are considered by Chipp and Ismail (2004) to relate to the low-cost and high-speed nature of the medium, the unlimited geographical scope as well as the fact that there is no interviewer bias and no data entry errors. The specific benefits in this regard related to the fact that the questionnaire was not printed and therefore any increases in the number of respondents did not increase the cost of the study and as the data was received in an electronic format there was little data capture and coding required. A consideration of the disadvantages of an internet-mediated questionnaire revealed that some studies



have found that online respondents are unlikely to make use of extreme points on a scale and tend to choose the middle value (McDonald and Adam, 2003). The risk was overcome in this study by making use of an unbalanced five point Likert-style rating scale that was used to establish members' behaviours. The five point Likert-style rating scale was considered to be unbalanced as it did not contain a middle "neutral" item and was skewed towards a positive response with the middle item representing a "slightly" confirmatory response to the scale items.

An online questionnaire was used (see Appendix A for a copy) and a post was started on [www.thehubsa.co.za](http://www.thehubsa.co.za) requesting members to complete the questionnaire by following a link to Survey Monkey ([www.surveymonkey.com](http://www.surveymonkey.com)). The process followed was a self-selection sample and consisted of the type of people that were willing to take part in the research (Chipp and Ismail, 2004) which may have resulted in the disadvantage that the group was not representative of the universe of people. The web-based survey was an open type which meant that the website could be accessed and the survey completed by any visitor (Chipp and Ismail, 2004). The post started on [www.thehubsa.co.za](http://www.thehubsa.co.za) made specific reference to the fact that the survey was being conducted by a Gibs MBA student who was also a cyclist and member of the [www.thehubsa.co.za](http://www.thehubsa.co.za) online community. In addition, the post listed the benefits members would receive from participating which included a better understanding (on the part of management of the website) of which Web 2.0 tools were being used by members as well as the extent of use and the perceived benefit that the members derived. The link available in the post redirected interested members to the online questionnaire that was available for completion on Survey Monkey.

#### 4.6. Measurement instrument

Constructs and scales used in the questionnaire were based on the literature reviewed. The DART scales were developed based on the definition of what activities and behaviours contributed to the definition of co-creation per the research of Prahalad and Ramaswamy (2004). As the DART scales were developed from the existing literature there was no Cronbach alpha available to assess the reliability of the scales. The approach followed to develop DART scales was to consider the elements of the concept of co-creation as specified by Prahalad and Ramaswamy (2004) and tailor these to the specific co-creation environment of [www.thehubsa.co.za](http://www.thehubsa.co.za). The practical and specific components of co-creation on the website were matched to the DART framework through a process of deciding which contributed to each of dialogue, access, risk-benefits and transparency (DART). By following this approach it was possible to develop a scale that tested whether co-creation was actually present on the cycling forum. The website is structured into a number of general forums in which specific topics of interest can be started or added to by members making posts. The following scale items were developed to test the DART framework by asking a series of behavioural questions relating to the extent to which users currently “do” the following:

- Dialogue
  - Respond to posts that interest me
  - Start a post based on a topic of my choice
  - Interact with the website administrator
  - Make use of user generated content
  - Make use of moderator generated content

- Generate my own content
- Read the contributions of others
- Flag topics that I would like to return to
- Log on as a member
- Log on as a guest
- Start a new topic
- Post a response to an existing topic
- Access
  - Chose a topic of interest from the list of active forums
  - Make a decision based on information posted by other members
  - Buy goods and services that I customise through my interaction with the website
- Risk-benefits
  - Benefit from the interaction between administrator and users
  - Use the information in posts to make decisions
  - Post information on both the risks and benefits relating to a particular topic
- Transparency
  - Freely voice my opinion on a specific topic
  - Report posts when I think the comments are offensive

A similar approach was followed in order to develop scale items to measure the impact of the Web 2.0 applications available on [www.thehubsa.co.za](http://www.thehubsa.co.za) on the individual members' ability to co-create. The SLATES six components of Enterprise 2.0 technologies as proposed by McAfee (2006) were developed into a scale through a consideration of the Web 2.0 tools offered by the website that matched the specific six

components that made up the SLATES framework. For this reason there was also no Cronbach alpha available to assess the reliability of the scale. It should be noted that no scale was developed for either the “tags” or the “extensions” component of the SLATES framework as the website tested ([www.thehubsa.co.za](http://www.thehubsa.co.za)) did not have the specific technology to tag (categorise) or recommend customised content for individual users. The following scale items were developed to test the SLATES framework by asking a series of behavioural questions to determine the extent to which users made use of the following Web 2.0 tools:

- Search
  - The search function to search for specific information
- Links
  - Links to jump between information on different web pages
  - Links in the site menu to access information on other websites
  - The Twitter link
  - The Facebook link
- Authoring
  - The tool to upload photos in the photo gallery
  - The tool to upload photos in forum posts
  - The private messenger function
  - The fast reply function
  - The comment function
  - The email a friend function

- Signals
  - The “watch this topic” function to notify me/email when topic is updated
  - RSS feed to notify me when content is updated

The questionnaire made use of closed questions and more specifically rating questions to gather opinion data. A five point Likert-style rating scale was used in order to determine the extent to which a respondent performed a specific activity / used a particular Web 2.0 tool on the website.

#### **4.7. Data analysis**

As proposition one required a comparison between the means of a group and the population the appropriate statistical technique was the t-Test (Zikmund, 2003).

For proposition two correlation analysis was used to determine the strength and direction of the linear relationship between the scale items that made up the DART co-creation scale and those that constituted the Web 2.0 scale. Pearson correlation is designed for interval level variables and for this reason was considered most appropriate.

According to Saunders, Lewis and Thornhill (2009), the regression coefficient is the most appropriate method of determining the relationship between a dependent variable and one or more independent variables. Regression analysis is used to calculate a regression equation for one independent variable. However, as the regression equation for proposition three involved more than one independent variable it was necessary to make use of multiple regression analysis.

In the case of proposition 4a and 4b logistic regression was used as it allows for an assessment of how well a set of predictor variables predicts or explains a categorical dependent variable (product/service and brand usage). In addition Logistic regression was considered to be appropriate in order to obtain an indication of the adequacy of the model through an assessment of “goodness of fit”.

Statistical analysis software was used to calculate the significance of the multiple regression coefficient and the independent variables in the logistic regression based on the probability (p-value) of the test result. The p-value was evaluated on the following basis per Saunders, Lewis and Thornhill (2009, p. 450) “if the probability of obtaining the test statistic or one more extreme by chance alone is higher than 0.05, then you conclude that the relationship is not statistically significant. Statisticians refer to this as accepting the null hypothesis”. This formed the basis for the evaluation of proposition three as well as proposition 4a and 4b.

#### **4.8. Research limitations**

The research had the following limitations:

- A low response rate could result in insufficient variance in the data collected which will negatively impact the statistical tests to be performed.
- The research was focussed solely on a cycling website with the result that the findings might not be applicable to other websites.
- As a non-probability sampling technique was used it was not possible to make statistical inferences about the population.

- The use of a self-administered internet-mediated questionnaire may have lead to respondents discussing their answers with others which may have contaminated the responses.
- Internet based surveys are prone to self-selection (volunteer) bias meaning that respondents are limited to those that want to take part in the survey. In addition there may have been a lack of authority in the sense that the survey has conducted electronically and did not involve any human interaction which might have resulted in some of the interviewer “authority” being lost.
- An element of researcher bias was present in the design of the instrument in that:
  - Both the co-creation and Web 2.0 applications scales were developed by the researcher based on his experience as a regular user of the website being tested.
  - The researcher specified a subjective and incomplete list of products/services and brands in the questionnaire (although an option for “other” was included) in order to test product/service and brand usage.
- A lack of scale items for the proposed scales may result in scale reliability issues.

## Chapter 5 – Results

### 5.1. Descriptive statistics

PASW (SPSS) Statistics 18 software was used in order to analyse the raw data and run the descriptive statistics.

#### 5.1.1. Responses

The targeted number of respondents was set at 220 based on a 2% assumed realistic response rate for online surveys and a total of 11,000 respondents being the estimated membership base of [www.thehubsa.co.za](http://www.thehubsa.co.za) during the month of September 2010. A total of 258 responses were received, however, during the data cleaning process it was discovered that 57 respondents failed to answer most questions in the survey. Based on the fact that a non-probability sampling technique was adopted and a sufficient number of respondents remained after deleting the missing data (201) an approach was taken to remove these respondents from the data (Hair, Anderson, Tatham and Black, 1998). This left a total of 201 respondents that had answered all the survey questions with no missing data which represented a response rate of 1.8%.

#### 5.1.2. Demographics

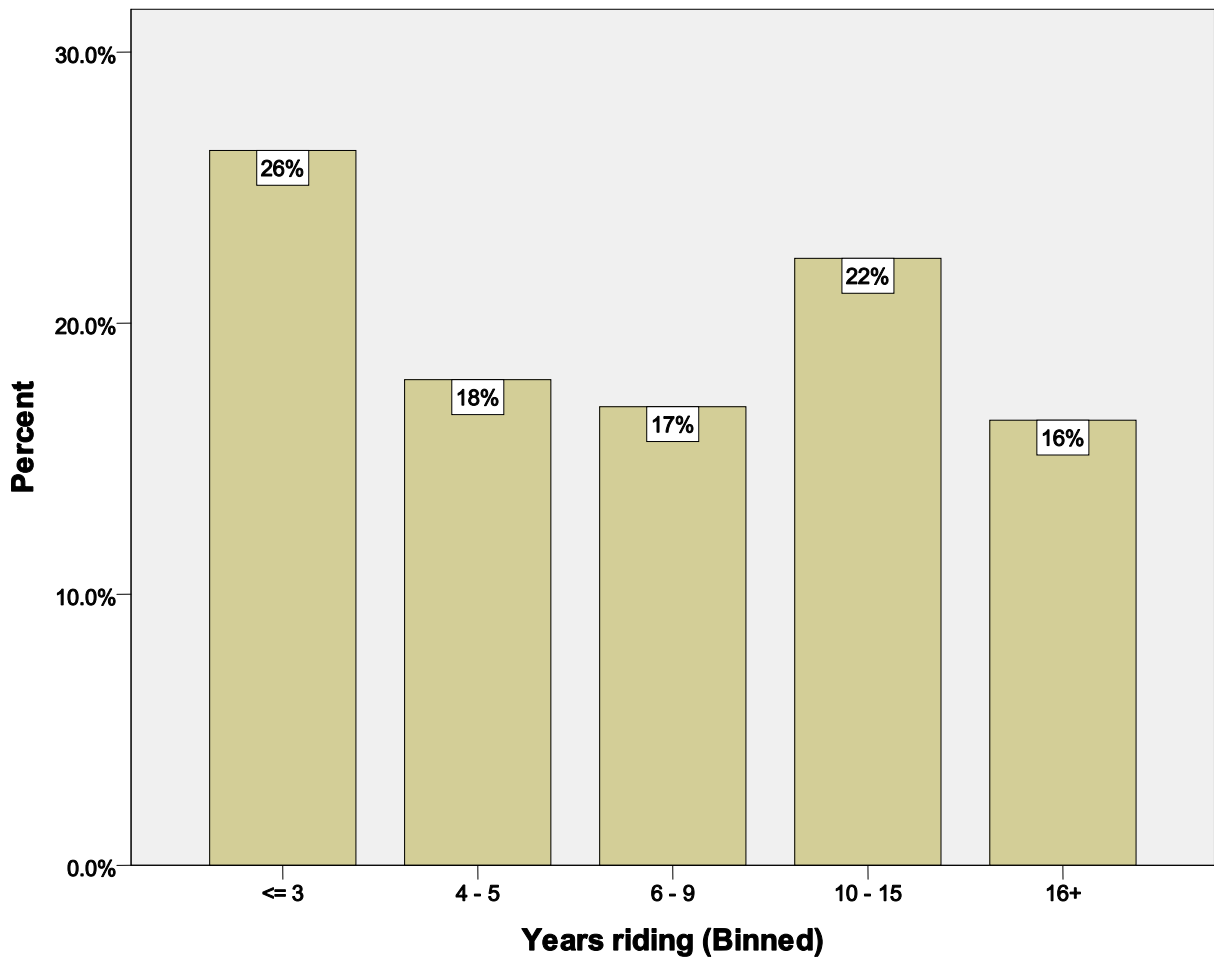
##### Bike riding experience

The majority of respondents (26%) have been riding a bike for three years or less. The next most represented category were those cyclists that have been riding a bike for between 10 and 15 years (22%). 18% of respondents have been riding a bike for between four and five years. Cyclists that have been riding a bike for between six and nine years consisted of 17% of the respondents with the lowest percentage (16%)



recorded for the group that had been riding a bike for more than 16 years. There was one respondent that had been riding a bike for 53 years which was the highest response. The data suggested that the majority of respondents that made use of the website in September 2010 had been riding a bike for less than 15 years (84%) while 26% of the respondents indicated that they had not been riding for more than three years

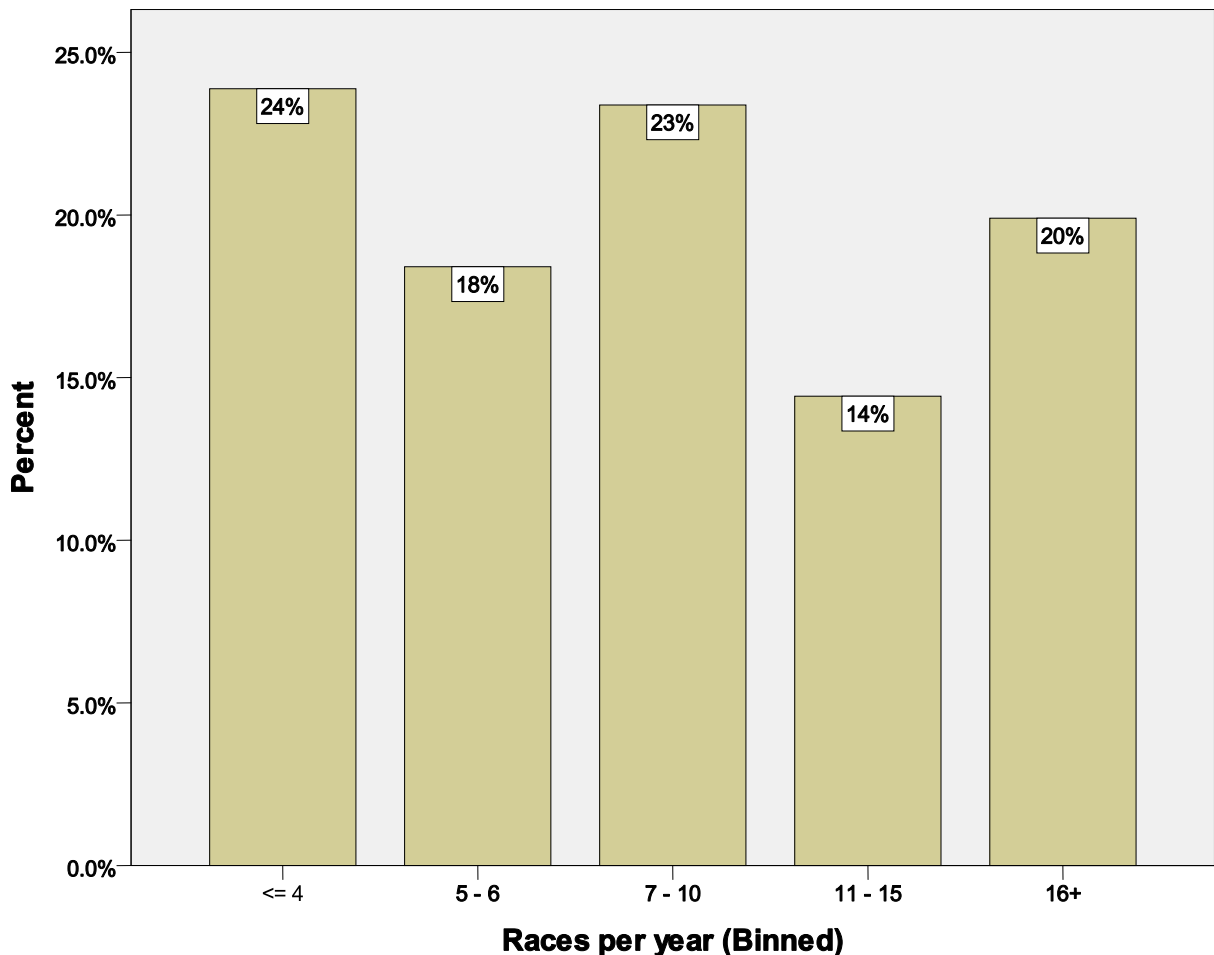
**Figure 5.1: Percentage of respondents by total years riding a bike**



## Participation in races

A total of 24% of the respondents have completed up to 4 races per year. A further 23% completed between seven and ten races per year. The next highest category included those that have completed 16 and more races (20%). The remaining respondents completed between five and six races a year (18%) and 11 and 15 races a year (14%). There was one respondent that participated in 50 races per year which represented the highest frequency.

**Figure 5.2: Percentage of respondents by races participated in each year**

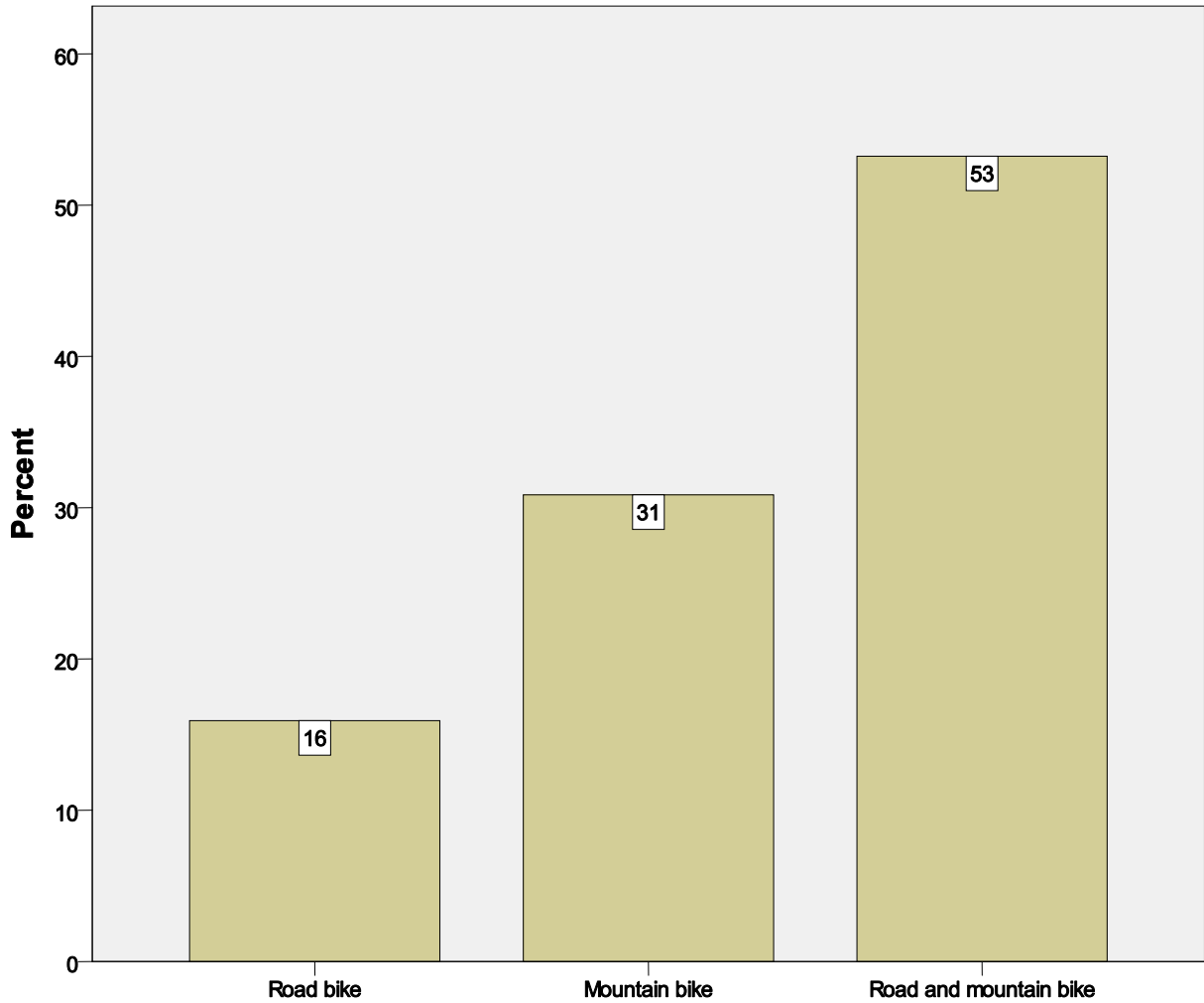


Based on the above demographics the majority of respondents have been riding for three years or less and compete in four or less races per year. This indicated that the cyclists using the website are fairly inexperienced cyclists based on these two factors.

### Type of bike riding

The majority of respondents ride both road and mountain bikes (53%). 31% of the respondents ride only mountain bikes with the balance of 16% riding only road bikes.

**Figure 5.3: Type of bike riding**

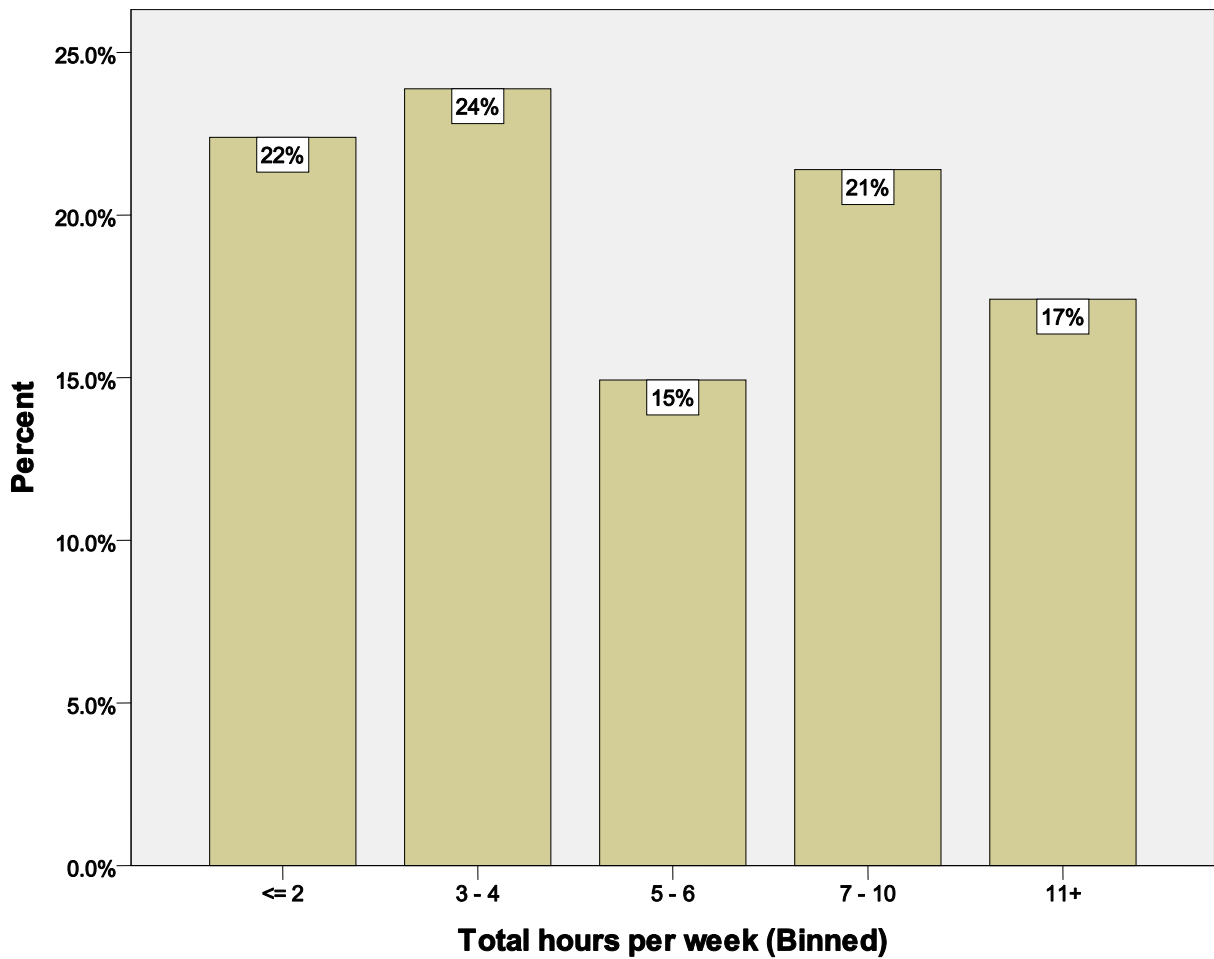


Time per week spent on website

24% of the respondents spent between three and four hours per week on the website. The next highest category (22%) was for respondents that spent two or less hours per week on the website. Only 15% of respondents were represented in the lowest

category of those that spent between five and six hours per week on the website while 17% spent more than 11 hours per week on the website. Two respondents were found to spend 50 hours per week on the website.

**Figure 5.4: Total hours per week spent on the website**



### 5.1.3. Descriptive statistics for each scale

#### DART co-creation scale

The DART co-creation scale values were calculated by taking the mean of the scores of the individual scale items that made up each of the Dialogue, Access, Risk benefits and Transparency scales (refer to section 4.6. “Measurement instrument” above for details of the scale items).

**Table 5.1: Descriptive statistics per DART scale dimension**

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Dialogue	201	1.33	4.00	2.8300	.49783	-.188	.172	-.144	.341
Access	201	1.00	5.00	3.4693	.74182	-.329	.172	.556	.341
Risk_benefits	201	1.00	5.00	2.9270	.73800	.149	.172	.087	.341
Transparency	201	1.00	5.00	2.5323	.88045	.422	.172	-.045	.341

The means for the Dialogue, Access and Risk benefit scales indicated that the respondents were at least “slightly” (score of 3 on the five point Likert-style rating scale) doing the activities on the website that measured the particular scale items. The mean for the Transparency scale suggested that the respondents were between slightly and “hardly” (score of 2 on the five point Likert-style rating scale) involved in the transparency scale item behaviours.

The negative skewness for Dialogue (-0.188) and Access (-0.329) indicated a clustering of scores on the high end of the rating scale. In the case of Access the high negative skewness is supported by the maximum statistic of 5 as well as the high mean score (3.47). Likewise, the positive skewness for Transparency (0.422) suggested a low

rating bias which is supported by the relative low mean of 2.53. The positive Kurtosis for the Access and Risk benefit scales indicated that the distribution is clustered in the centre with long thin tails. The negative Kurtosis for the Dialogue and Transparency scales indicated a distribution that is relatively flat with cases in the extremes.

#### Assessment for normality of DART scale

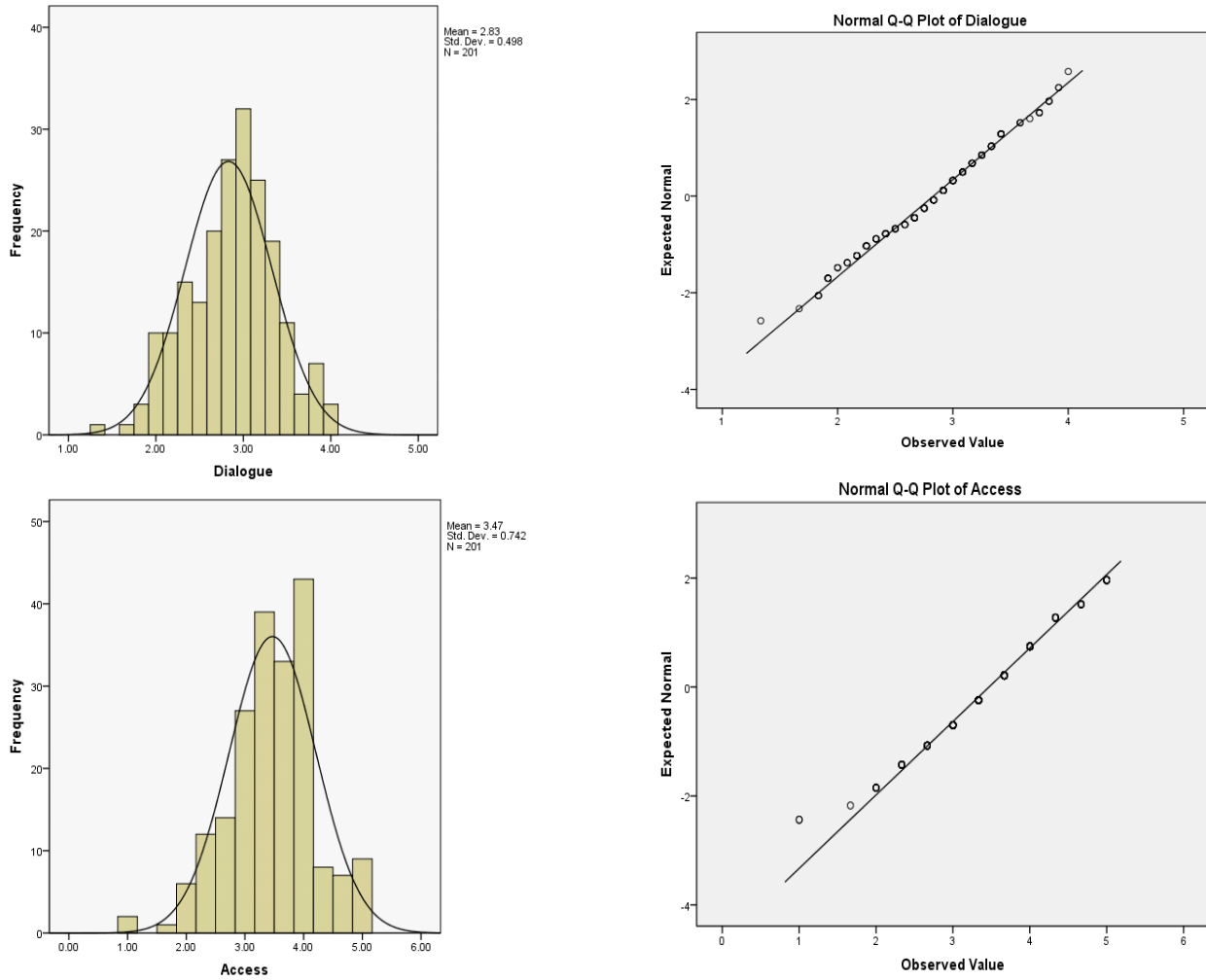
A consideration of the 5% trimmed mean for each of the scales as set out in the tables in Appendix B revealed the following regarding normality:

- Dialogue – the 5% trimmed mean was 2.8311 which was very close to the mean of 2.8300. This is supported by the values in the extreme values table which did not have a significant impact on the mean.
- Access – the 5% trimmed mean was 3.4788 which was very close to the mean of 3.4693. There were, however, extreme values recorded at the extreme low end and high end of the rating scale. These extreme values do not appear to have significantly impacted the mean.
- Risk benefits – the 5% trimmed mean was 2.9190 which was very close to the mean of 2.9270. There were, however, extreme values recorded at the extreme low end and high end of the rating scale. These extreme values do not appear to have significantly impacted the mean.
- Transparency – the 5% trimmed mean was 2.5083 which was very close to the mean of 2.5323. There were, however, extreme values recorded at the extreme low end and high end of the rating scale. These extreme values do not appear to have significantly impacted the mean.

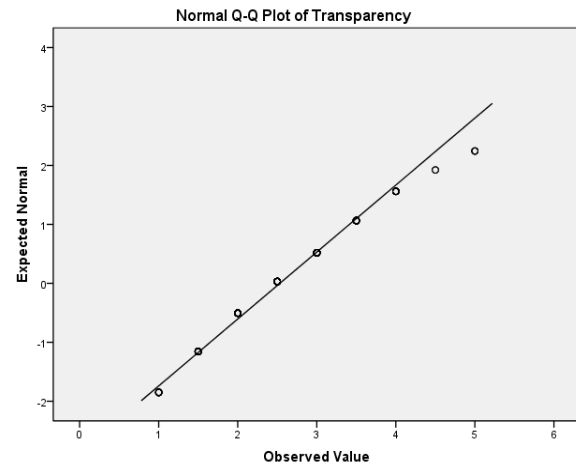
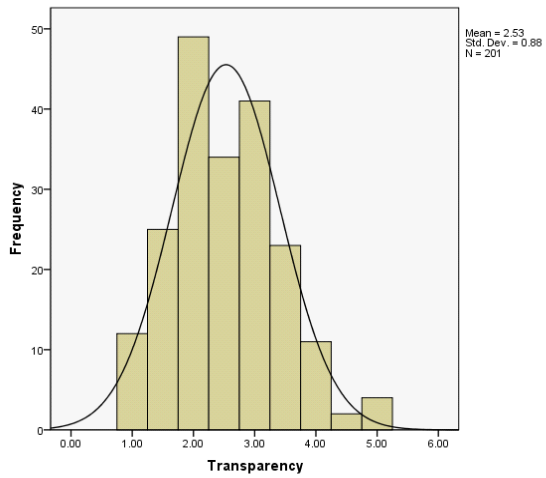
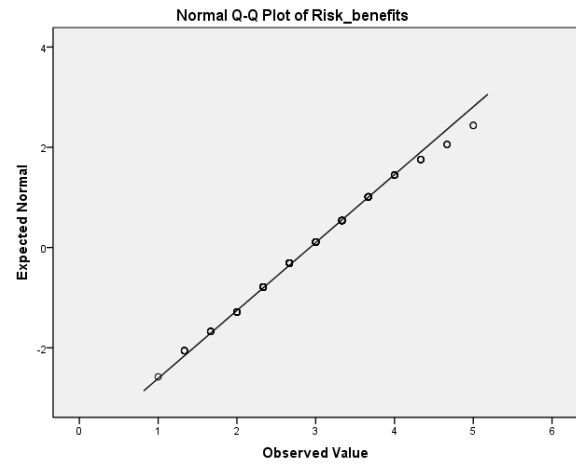
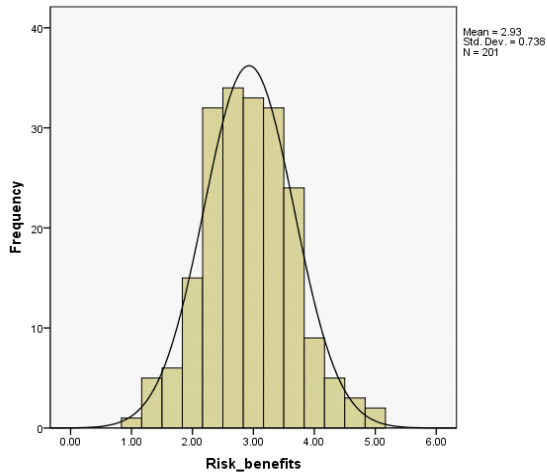
Histograms (see Figure 5.5) produced for each of the four DART co-creation scales indicated that the scores appeared to be normally distributed with the most scores occurring in the centre of the graph with no significant outliers. This is supported by the normal probability plots (labelled Normal Q-Q Plot – see Figure 5.5) in which the observed value for each score is plotted against the expected value from the normal distribution. The distributions for all the scales appeared to be normal as the lines representing the actual data distribution closely followed the straight diagonal line that represented the normal distribution which is considered by Hair et al (1998) to be a reliable test for normality. The boxplot for Dialogue indicated only one outlier while the boxplot for Access and Risk benefits revealed two outliers. The boxplot for Transparency had four outliers. See Appendix D for the boxplots.



Figure 5.5: Histograms and normal probability plots for DART co-creation scales



**Figure 5.5 (continued): Histograms and normal probability plots for DART co-creation scales**



## SLATES Web 2.0 scale

The SLATES Web 2.0 scale values were calculated by taking the mean of the scores of the individual scale items that made up each of the Search, Links, Authoring and Signals scales (refer to section 4.6. “Measurement instrument” above for details of the scale items).

**Table 5.2: Descriptive statistics per SLATES scale dimension**

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Search	201	1.00	5.00	3.7214	.84970	-.469	.172	-.040	.341
Links	201	1.00	4.00	2.1903	.57078	.372	.172	.656	.341
Authoring	201	1.00	4.83	2.5265	.75800	.278	.172	.099	.341
Signals	201	1.00	5.00	1.9502	.93274	.865	.172	.434	.341

The Search scale item returned the highest mean of 3.72 which translated into the respondents using these particular Web 2.0 tools closer to “often” (4 on the rating scale) than “slightly” (3 on the rating scale). In addition, the Search scale item had the only negative skewness (-0.469) which reflected high ratings on the scale. The Authoring scale item had a mean just above the halfway point of the rating scale (2.53) while Links (2.19) and Signals (1.95) were both closer to a rating of 2 which indicated that the Web 2.0 tools were “hardly” used.

Histograms produced for the SLATES Web 2.0 scale items revealed that only the Links and Authoring scale items appeared to have a fairly normal distribution. Relative to the other scale items, Search had a negative skewness indicated by the high scoring tendency in the histogram below and Signals had a relatively high positive skewness indicated by the low scoring tendency per the histogram. The positive Kurtosis for the

Links, Authoring and Signals scales indicated that the distribution is clustered in the centre with long thin tails. The negative Kurtosis for the Search scale indicated a distribution that is relatively flat with cases in the extremes.

#### Assessment for normality of SLATES Web 2.0 scale

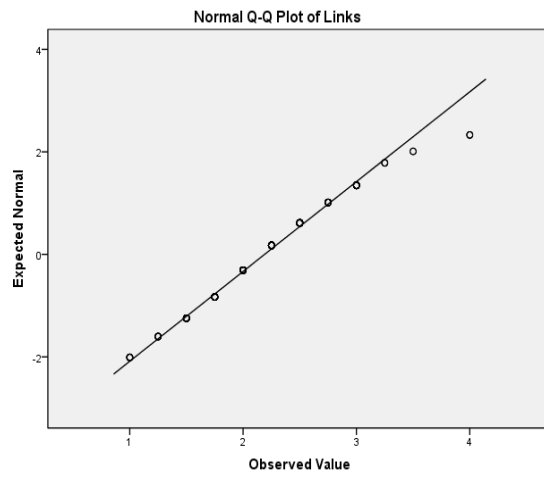
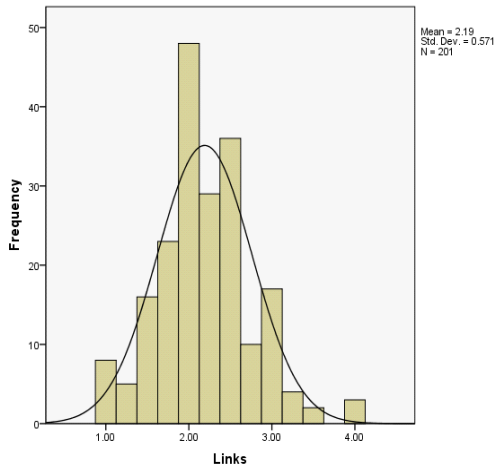
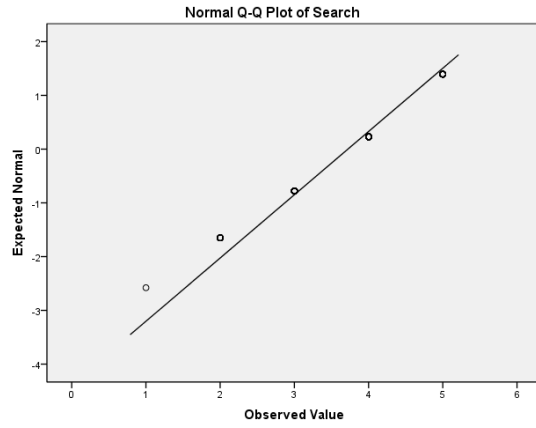
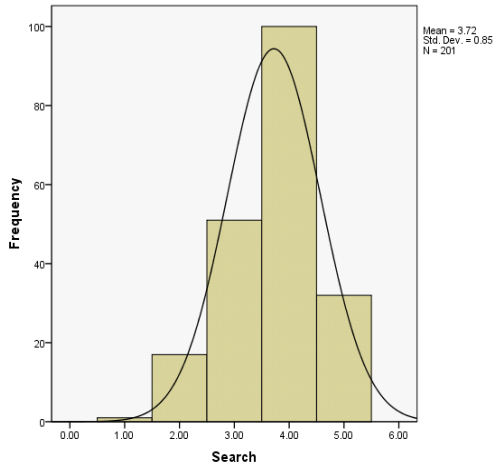
A consideration of the 5% trimmed mean for each of the scales as set out in Appendix C revealed the following regarding normality:

- Search – the 5% trimmed mean was 3.7515 which was very close to the mean of 3.7214. There were, however, extreme values recorded at the extreme low end and high end of the rating scale. These extreme values do not appear to have significantly impacted the mean.
- Links – the 5% trimmed mean was 2.1810 which was very close to the mean of 2.1903. There were, however, extreme values recorded at the extreme low end of the rating scale. These extreme values do not appear to have significantly impacted the mean.
- Authoring – the 5% trimmed mean was 2.5082 which was very close to the mean of 2.5265. There were, however, extreme values recorded at the extreme low end of the rating scale. These extreme values do not appear to have significantly impacted the mean.

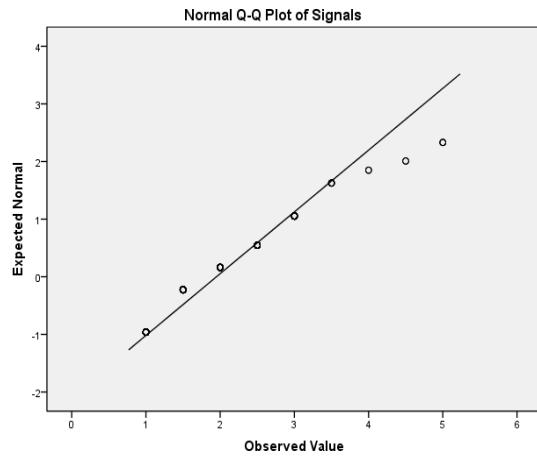
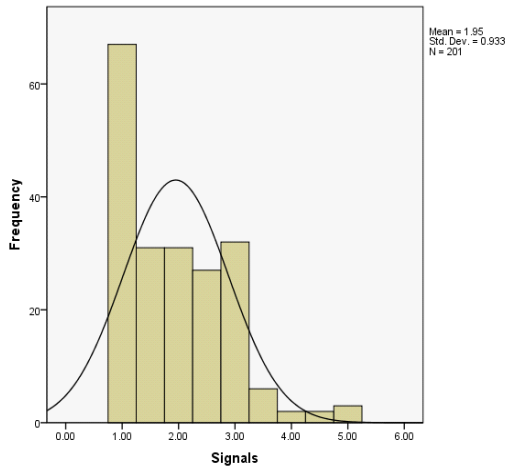
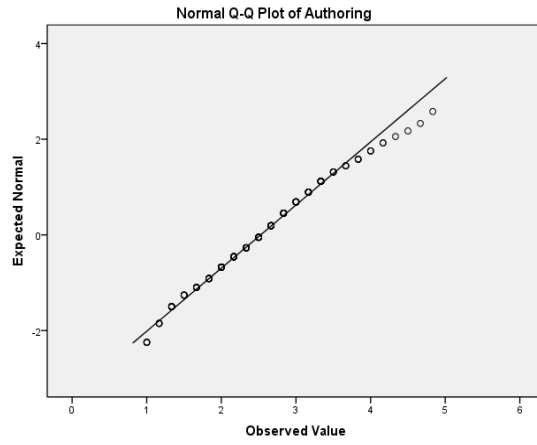
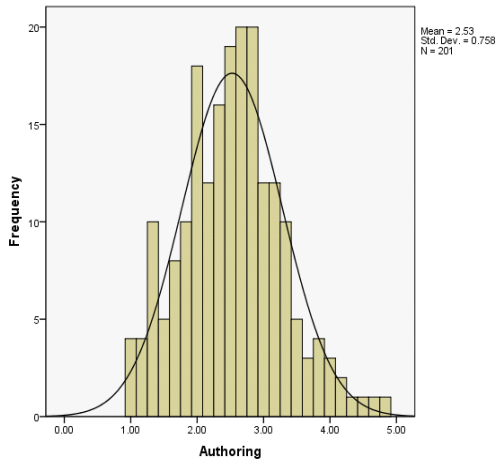
- Signals – the 5% trimmed mean was 1.8755 which was very close to the mean of 1.9502. There were, however, extreme values recorded at the extreme low end and high end of the rating scale. These extreme values do not appear to have significantly impacted the mean.

Histograms (see Figure 5.6) produced for each of the four SLATES Web 2.0 scales indicated that the scores appeared to be normally distributed with the most scores occurring in the centre of the graph with no significant outliers. This is supported by the normal probability plots (labelled Normal Q-Q Plot – see Figure 5.6) in which the observed value for each score is plotted against the expected value from the normal distribution. The distributions for all the scales appeared to be normal as the lines representing the actual data distribution closely followed the straight diagonal line that represented the normal distribution which is considered by Hair et al (1998) to be a reliable test for normality. The boxplot for Search indicated only one outlier while the boxplot for Links and Signals revealed two outliers. The boxplot for Authoring had two outliers. See Appendix D for the boxplots.

**Figure 5.6: Histograms and normal probability plots for SLATES co-creation scales**



**Figure 5.6 (continued): Histograms and normal probability plots for SLATES co-creation scales**



#### **5.1.4. Transformations to achieve normality**

Hair et al (1998) suggested that the most appropriate transformation procedures are the inverse, square root and logarithm. These three transformation procedures were applied to each of the DART co-creation and SLATES Web 2.0 scale variables in an attempt to transform the scale variables to approximate the Normal distribution in order to run parametric tests of significance. Appendix E sets out the results of the transformation process and the calculated Skewness, Kurtosis and Kolmogorov-Smirnov (K-S) significance values. The transformed distributions only showed increased signs of normality for the Links and Authoring scale variables as measured by the Skewness and Kurtosis values for the square root transformation. As the other scale variables remained non-normal it was decided to continue with the testing by applying exploratory factor analysis (see section 5.2.1.) to resolve the normality issues.

#### **5.2. Internal consistency of scales**

The consistency of both the DART and SLATES scales were measured by calculating the Cronbach's alpha. Hair et al (1998) defined Cronbach's alpha as a common measure of reliability for two or more scale items and noted that a generally agreed lower limit is 0.70 with values of between 0.60 and 0.70 deemed to be the lower level of acceptability. An issue in assessing the Cronbach's alpha is the positive relationship with the number of items in the scale and for this reason, Hair et al (1998) suggested applying more stringent requirements when addressing scales with a number of items. Kerlinger (1979), however, proposed that a lower Cronbach's alpha score of 0.65 was an acceptable indication of reliability. Pallant (2007) acknowledged that scales with fewer items tend to have lower Cronbach alpha values and in these cases it was



considered more appropriate to evaluate the reliability of the scale through an assessment of the mean inter-item correlation. The optimal range for inter-item correlation per Briggs and Cheek (1986) was found to be between 0.2 and 0.4.

Dialogue scale

**Table 5.3: Dialogue reliability and item-total statistics**

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.721	.727	12

**Table 5.3: Dialogue reliability and item-total statistics (continued)**

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Respond to posts that interest me	30.49	28.121	.627	.581	.665
Start a post based on a topic of my choice	31.23	27.837	.586	.633	.667
Interact with the website administrator	32.61	33.380	.276	.142	.713
Make use of user generated content	31.03	30.179	.364	.361	.701
Make use of moderator generated content	31.79	31.119	.316	.343	.708
Generate my own content	31.30	28.380	.586	.459	.670
Read the contributions of others	29.72	33.142	.220	.104	.718
Flag topics that I would like to return to	31.83	30.925	.199	.067	.733
Log on as a member	29.45	32.309	.241	.415	.717
Log on as a guest	32.41	38.214	-.280	.338	.783
Start a new topic	31.20	27.410	.634	.715	.660
Post a response to an existing topic	30.51	27.981	.674	.649	.660

The Cronbach's alpha of 0.727 indicated that the scale is reliable. However, the Item-Total statistics table above indicates that there is a negative correlation between the item "log on as a guest" and the Dialogue scale. Removing this item from the scale resulted in an improvement in the Cronbach's alpha to 0.783.

### Access scale

**Table 5.4: Access reliability and summary item statistics**

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.579	.582	3

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Inter-Item Correlations	.317	.219	.401	.181	1.827	.007	3

The Cronbach's alpha for the Access scale was found to be 0.582 which was considered to be poor (this score cannot be improved by deleting any of the items from the scale). This is explained on account of there only being three items to measure the scale. The mean inter-item correlation of 0.317 is, however, considered to fall within the optimal range.

## Risk-benefits scale

**Table 5.5: Risk-benefits reliability and summary item statistics**

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.521	.526	3

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Inter-Item Correlations	.270	.199	.371	.173	1.869	.007	3

The Cronbach's alpha for the Risk-benefits scale is considered to be poor (0.526). The result can be improved to 0.538 if the item "posts information on both the risks and benefits relating to a particular topic" is removed from the scale, however, this did not improve the overall reliability of the scale to an acceptable level. The mean inter-item correlation is 0.270 which is considered to be within the optimal range.

## Transparency scale

**Table 5.6: Transparency reliability and summary item statistics**

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.508	.513	2

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Inter-Item Correlations	.345	.345	.345	.000	1.000	.000	2

The Cronbach's alpha for the Transparency scale was found to be 0.513 which was considered to be poor (this score cannot be improved by deleting any of the items from the scale). This is explained on account of there only being two items to measure the scale. The mean inter-item correlation of 0.345 is, however, considered to fall within the optimal range.

### Search scale

As the Search scale consisted of only one item – “the search function to search for specific information” – a Cronbach's alpha could not be calculated. This is considered to be a shortcoming of the current study.

### Links scale

**Table 5.7: Links reliability and summary item statistics**

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.589	.619	4

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Inter-Item Correlations	.289	.096	.714	.618	7.431	.063	4

The Cronbach's alpha for the Links scale was found to be 0.619 which was considered to be poor (this score cannot be improved by deleting any of the items from the scale). This is explained on account of there only being four items to measure the scale. The mean inter-item correlation of 0.289 is, however, considered to fall within the optimal range.

## Authoring scale

**Table 5.8: Authoring reliability and item-total statistics**

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.766	.765	6

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
The tool to upload photos in the photo gallery	13.05	14.142	.573	.398	.714
The tool to upload photos in forum posts	12.56	14.388	.527	.402	.727
The private messenger function	11.81	14.777	.592	.404	.711
The fast reply function to reply to forum topics	11.67	14.452	.514	.346	.731
The comment function to comment on users' profiles, images in the photo gallery or links in the links directory	13.18	15.328	.472	.319	.741
The email a friend function	13.53	17.130	.382	.212	.761

The calculated Cronbach’s alpha of 0.765 indicated that the scale is reliable and the table above revealed that the Cronbach’s alpha for the scale cannot be improved on by removing any of the individual scale items.

### Signals scale

**Table 5.9: Authoring reliability and summary item statistics**

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.450	.478	2

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Inter-Item Correlations	.314	.314	.314	.000	1.000	.000	2

The Cronbach’s alpha for the Signals scale was found to be 0.478 which was considered to be unacceptable (this score cannot be improved by deleting any of the items from the scale). This is explained on account of there only being two items to measure the scale. The mean inter-item correlation of 0.314 is, however, considered to fall within the optimal range.

The above issues relating to the internal consistency and reliability of the scales will be borne in mind when analysing the results.

#### **5.2.1. Exploratory factor analysis**

Exploratory factor analysis was used in order to gather information about the interrelationships among the variables that made up both the DART co-creation scale and the SLATES Web 2.0 scale. The items that made up each scale were subject to

principal components analysis (PCA) which is a form of factor analysis commonly used in order to develop and evaluate scales.

### Findings – DART co-creation scale

The 20 items that made up the DART co-creation scale were subjected to PCA using PASW18. The suitability of the data for factor analysis was considered by inspection of the Kaiser-Meyer-Olkin value (0.818) that exceeded the recommended value of 0.6 and Bartlett's Test of Sphericity that was significant.

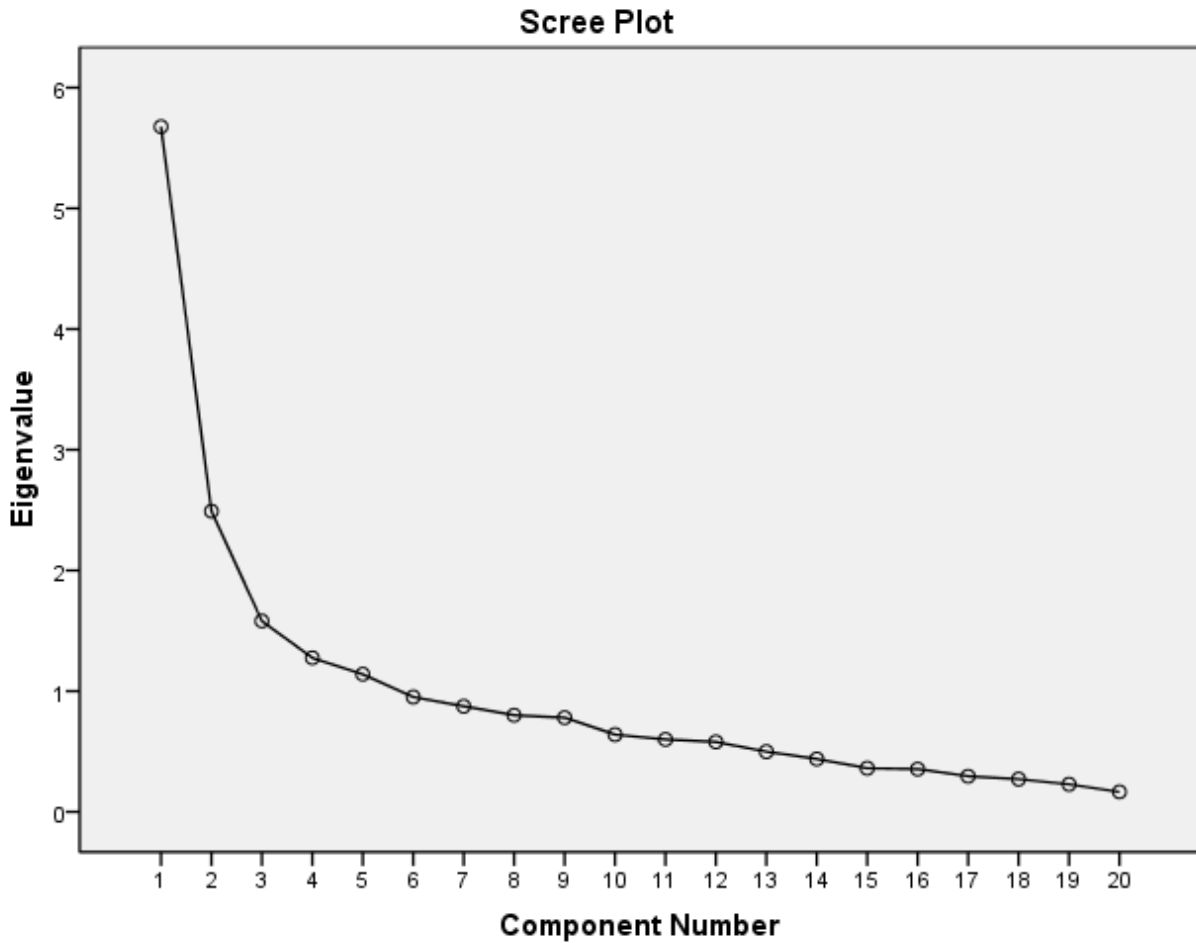
**Table 5.10: DART KMO and Bartlett's test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.818
Bartlett's Test of Sphericity	Approx. Chi-Square	1551.913
	df	190
	Sig.	.000

Principal component analysis revealed the presence of five components with eigenvalues exceeding 1 that explained 28.4%, 12.5%, 7.9%, 6.4% and 5.7% of the variance respectively. An inspection of the screeplot revealed a clear break after the second component and making use of Catell's scree test, it was decided to retain two components for further analysis.



Figure 5.7: DART Scree plot



Component 1 explained 28.4% of the variance and component 2 explained 12.5% of the variance. A total of 40.9% of total variance was explained by both components. The results of the Varimax rotation indicated that both components displayed a number of strong loadings and all variables loaded substantially on only one component.

**Table 5.11: DART Varimax rotated component matrix and component transformation matrix**

Rotated Component Matrix			Component Transformation Matrix		
	Component		Component	1	2
	1	2			
Post a response to an existing topic	.824		1	.863	.506
Start a new topic	.814		2	-.506	.863
Freely voice my opinion on a specific topic	.808				
Respond to posts that interest me	.758				
Start a post based on a topic of my choice	.750				
Post information on both the risks and benefits relating to a particular topic	.708				
Generate my own content	.647				
Log on as a member	.452				
Report posts when I think the comments are offensive	.433				
Log on as a guest	-.400				
Interact with the website administrator	.347				
Use the information in posts to make decisions		.789			
Make a decision based on information posted by other members		.762			
Make use of user generated content		.625			
Benefit from the interaction between administrator and users		.558			
Buy goods and services that I customise through my interaction with the website		.558			
Make use of moderator generated content		.536			
Chose a topic of interest from the list of active forums		.525			
Read the contributions of others		.491			
Flag topics that I would like to return to					

Component 1 was labelled “Interact” based on a review of the variables that loaded against the component in the Varimax rotation. Making use of the guidelines for

identifying significant factor loadings based on sample size as suggested by Hair (1998) and taking into account the sample size of 201 for the current study, significant factor loadings were those above 0.40. The following variables loaded highly on the Interact component: 'post a response to an existing topic' (0.824); 'start a new topic' (0.814); 'freely voice my opinion on a specific topic' (0.808); 'respond to posts that interest me' (0.758); 'start a post based on a topic of my choice' (0.750); 'post information on both the risks and benefits relating to a particular topic' (0.708); 'generate my own content' (0.647); 'Log on as a member' (0.452); and 'report posts when I think that the comments are offensive' (0.433). The variables related to the respondents ability to respond on the website, create topics, contribute as a member or guest and interact with the administrator. All of these variables were thought to relate to the ability to interact on the website. Component 2 was labelled "Use" based on the number of variables related to the use of information and content that loaded against the component in the Varimax rotation. The following variables loaded highly on the Use component: 'use the information in posts to make decisions' (0.789); 'make a decision based on information posted by other members' (0.762); 'make use of user generated content' (0.625); 'benefit from the interaction between administrator and users' (0.558); 'buy goods and services that I customised through my interaction with the website' (0.558); 'make use of moderator generated content' (0.536); and 'choose a topic of interest from the list of active forums' (0.525); 'read the contribution of others' (0.491).

## Findings – SLATES Web 2.0 scale

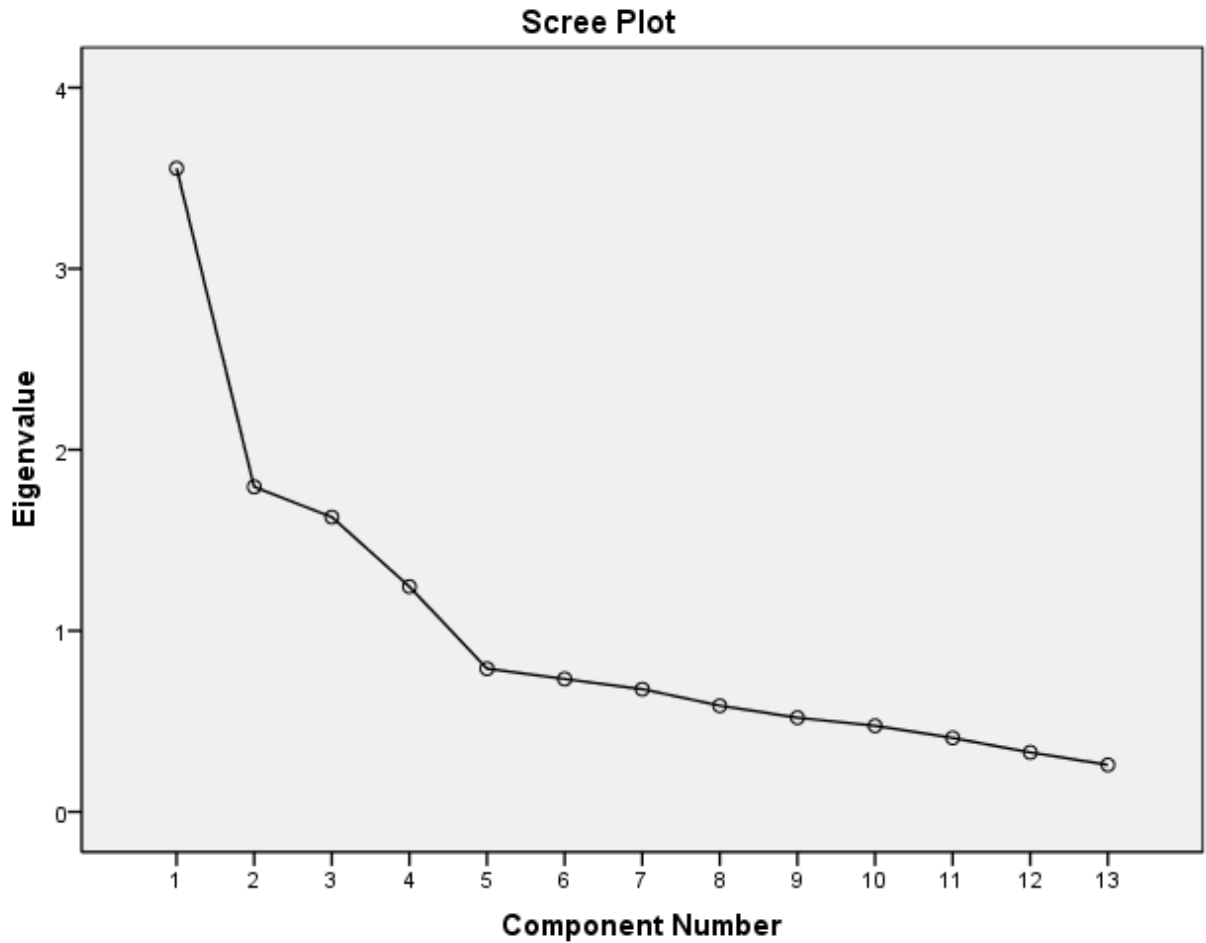
The 13 items that made up the SLATES Web 2.0 scale were subjected to PCA using PASW18. The suitability of the data for factor analysis was considered by inspection of the Kaiser-Meyer-Olkin value (0.730) that exceeded the recommended value of 0.6 and Bartlett's Test of Sphericity that was significant.

**Table 5.12: SLATES KMO and Bartlett's test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.730
Bartlett's Test of Sphericity	Approx. Chi-Square	714.593
	df	78
	Sig.	.000

Principal component analysis revealed the presence of four components with eigenvalues exceeding 1 that explained 27.3%, 13.8%, 12.5% and 9.6% of the variance respectively. An inspection of the screeplot revealed a clear break after the second component and making use of Catell's scree test, it was decided to retain two components for further analysis.

Figure 5.8: SLATES Scree plot



Component 1 explained 27.3% of the variance and component 2 explained 13.8% of the variance. A total of 41.1% of total variance was explained by both components. The results of the Varimax rotation indicated that both components displayed a number of strong loadings and all variables loaded substantially on only one component.

**Table 5.13: SLATES Varimax rotated component matrix and component transformation matrix**

Rotated Component Matrix			Component transformation matrix		
	Component		Component	1	2
	1	2			
The private messenger function	.694		1	.749	.662
The search function to search for specific information	.648		2	-.662	.749
The tool to upload photos in the photo gallery	.615	.364			
The tool to upload photos in forum posts	.615				
The fast reply function to reply to forum topics	.601				
Links in the site menu to access information on other websites	.537				
Links in posts to jump between information on different web pages	.519				
The Twitter link to share content in forum posts		.749			
The Facebook link to share content in forum posts		.715			
The email a friend function		.657			
The “watch this topic” function to notify me/email when topic is updated		.608			
The comment function to comment on users' profiles, images in the photo gallery or links in the links directory	.414	.493			
RSS feed to notify me when content is updated		.467			

Component 1 was labelled “Creating” based on a review of the variables that loaded against the component in the Varimax rotation. The following variables loaded highly on the Creating component (based on significant loadings above 0.40 as outlined above): ‘the private messenger function’ (0.694); ‘the search function to search for specific information’ (0.648); ‘the tool to upload photos in the photo gallery’ (0.615); ‘the tool to upload photos in forum posts’ (0.615); ‘the fast reply function to reply to forum topics’ (0.601); ‘links in the site menu to access information on other websites’ (0.537); and

'links in posts to jump between information on different web pages' (0.519). The variables related to the respondents ability to create content, search for content and access content. Component 2 was labelled "Sharing" based on the number of variables related to the sharing of content that loaded against the component in the Varimax rotation. The following variables loaded highly on the Sharing component: 'the Twitter link to share content in forum posts' (0.749); 'the Facebook link to share content in forum posts' (0.715); 'the email a friend function' (0.657); 'the "watch this topic" function to notify me/email when topic is updated' (0.608); 'the comment function to comment on users' profiles, images in the photo gallery or links in the links directory' (0.493); and 'RSS feed to notify me when content is updated' (0.467).

### **5.3. Testing of research propositions**

Proposition 1: Co-creation is present on the online cycling forum, [www.thehubsa.co.za](http://www.thehubsa.co.za)

Saunders et al (2009) indicated that significance testing is appropriate in order to test the probability of a test statistic or one more extreme occurring by chance alone. As the standard deviation of the population was unknown, the t-test was used as only the sample standard deviation could be calculated and was used as an estimate of the value of the population standard deviation. A one-sided directional t-test (Weiers, 2008) was used where the null hypothesis could be rejected by an extreme result in one direction only i.e. a value greater than the middle value of the rating scale (3) used for the sample. The testing was directional in order to determine if the sample statistic is greater than a test value and the test value was set as the middle item of the five point rating scale as suggested by Malhotra (2007) i.e. 3.

The test was performed on the four DART scale items as the distributions were considered to be normal based on a review of the normal probability plots (refer section 5.1.3.) and the t-test was therefore appropriate to use.

### Findings

The one-sided t-test returned a t-statistic of -4.841, 8.969 and -7.530 for each of Dialogue, Access and Transparency respectively with a p-value for the three items of 0.000 which was below the significance level of 0.05. This led to a rejection of the null hypothesis and indicated that the sample result is more extreme than can be attributed to chance alone. Based on the positive 95% confidence interval in the table below, the true mean in 95% of cases is greater than the test value of 3. The t-statistic for Risk benefits was -1.402, however, the p-value of 0.163 was greater than the significance level of 0.05. On this basis the null hypothesis cannot be rejected and the sample result is not more extreme than can be attributed to chance alone. At a 95% confidence interval, the true mean is less than the test value of 3.



**Table 5.14: Results of one-sample test**

	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Dialogue	-4.841	200	.000	-.16998	-.2392	-.1007
Access	8.969	200	.000	.46932	.3661	.5725
Risk_benefits	-1.402	200	.163	-.07297	-.1756	.0297
Transparency	-7.530	200	.000	-.46766	-.5901	-.3452

### Conclusion

Proposition 1 is supported in three of the four components

Proposition 2: Different Web 2.0 applications available on [www.thehubsa.co.za](http://www.thehubsa.co.za) determine/correlate with the individual members' ability to co-create.

The DART co-creation and SLATES Web 2.0 scale values were calculated by taking the mean of the scores of the individual scale items. Correlation analysis was used to determine the strength and direction of the linear relationship between the scale items that made up the DART co-creation scale and those that constituted the Web 2.0 scale. Pearson correlation is designed for interval level variables and for this reason was considered most appropriate.

## Findings

The results of the Pearson Correlation presented below were used to determine the strength of the relationship between the variables based on the value of the correlation coefficient. Cohen (1988) suggested the following guidelines:

- ❖ Small:  $r = 0.10$  to  $0.29$
- ❖ Medium:  $r = 0.30$  to  $0.49$
- ❖ Large:  $r = 0.50$  to  $1.0$

There was evidence of a strong positive correlation between the following variables:

- Dialogue and Authoring ( $r = 0.527$  significant at the 0.05 level)
- Transparency and Authoring ( $r = 0.505$  significant at the 0.05 level)

There was evidence of a medium positive correlation between the following variables:

- Dialogue and Signals ( $r = 0.344$  significant at the 0.05 level)
- Access and Search ( $r = 0.351$  significant at the 0.05 level)
- Access and Links ( $r = 0.315$  significant at the 0.05 level)
- Risk benefits and Links ( $r = 0.304$  significant at the 0.05 level)
- Risk benefits and Authoring ( $r = 0.424$  significant at the 0.05 level)

**Table 5.15: Pearson correlation results**

		Search	Links	Authoring	Signals
Dialogue	Pearson Correlation	.135	.217	.527	.344
	Sig. (2-tailed)	.057	.002	.000	.000
	N	201	201	201	201
Access	Pearson Correlation	.351	.315	.298	.206
	Sig. (2-tailed)	.000	.000	.000	.003
	N	201	201	201	201
Risk_benefits	Pearson Correlation	.244	.304	.424	.184
	Sig. (2-tailed)	.000	.000	.000	.009
	N	201	201	201	201
Transparency	Pearson Correlation	.086	.137	.505	.174
	Sig. (2-tailed)	.227	.053	.000	.014
	N	201	201	201	201

## Conclusion

There is support for proposition 2.

Proposition 3: Increased perceived co-creation on the site results in an increase in time spent on the site.

In light of the general lack of reliability with regards to the DART co-creation scales used in the survey (Dialogue was the only scale found to be reliable in terms of the calculated Cronbach's alpha) it was decided to make use of the two factors (Interact and Use) identified as a result of the PCA in order to perform a multiple regression test for proposition 3. The impact of the two independent variables, being the Interact and Use factors identified, on the dependent variable "total time per week spent on the website" (total week time) was analysed making use of multiple regression. This was considered to be the most relevant statistical test as it is a multivariate statistical technique used to

examine the relationship between a single dependent variable and a number of independent variables (Hair et al, 1998).

### Findings

The results of the multiple regression that was performed in PASW18 was assessed for the assumption relating to multicollinearity by a review of the relationships between the independent variables and ensuring that there were no correlations equal to 0.90 or greater as suggested by Hair (1998). Normality was checked by reviewing both the Normal Probability Plot and Scatterplot. The correlations between the variables in the model are provided in the table below and revealed that the only independent variable that displayed a meaningful relationship with the dependent variable was Interact. The correlation between the independent variables was checked and there were no correlations that were considered to be too high (above 0.90).

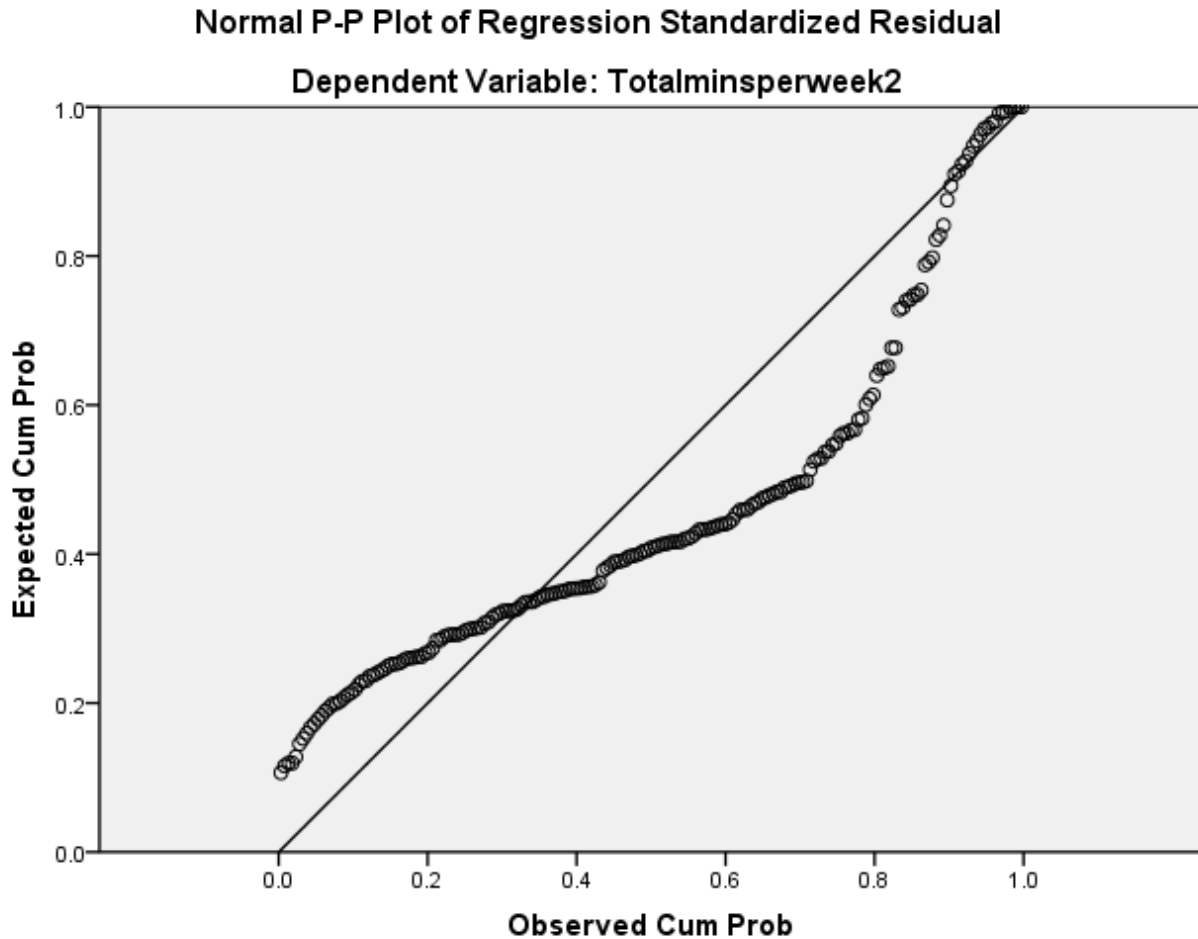
**Table 5.16: Multiple regression correlation results**

		Totalmins perweek2	Interact factor score	Use factor score
Pearson Correlation	Totalminsperweek2	1.000	.284	.216
	Interact factor score	.284	1.000	.000
	Use factor score	.216	.000	1.000
Sig. (1-tailed)	Totalminsperweek2	.	.000	.001
	Interact factor score	.000	.	.500
	Use factor score	.001	.500	.
N	Totalminsperweek2	201	201	201
	Interact factor score	201	201	201
	Use factor score	201	201	201

The normality assumption was checked by inspecting both the Normal Probability Plot (P-P) of the Regression Standardised Residual as well as the Scatterplot. Per Hair et al

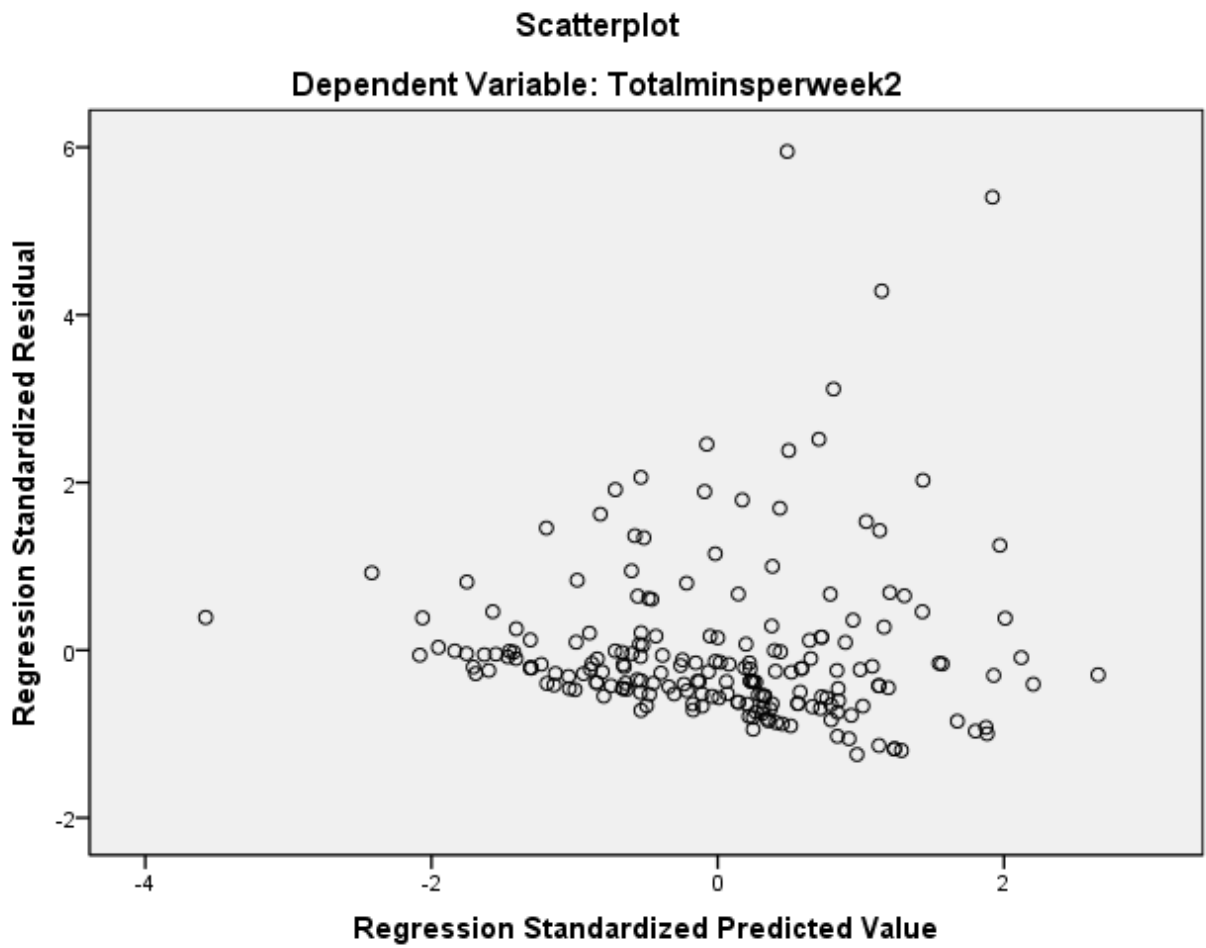
(1998) the normal probability plot “compares the cumulative distribution of actual data values with the cumulative distribution of a normal distribution”. The normal distribution in the graph below formed a straight diagonal line from the bottom left to the top right. If the distribution of the dependent variable was assumed to be normal it would have followed the diagonal line. This was not the case, as can be seen below, and the distribution can be described as nonpeaked with the distribution starting above the normal distribution diagonal line and falling below before returning to the diagonal line again.

Figure 5.9: Normal probability plot of regression standardised residual



A null scatterplot is the desired plot in which all the assumptions in multiple regression analysis are met (Hair et al, 1998) and is represented by the residuals falling randomly with relatively equal distribution about zero and not displaying a strong tendency for a value greater or less than zero. The scatterplot of the residuals presented below indicated that a number of violations occurred simultaneously and in particular nonlinearity and heteroscedasticity (Hair et al, 1998).

Figure 5.10: Regression residual scatterplot



**Table 5.17: Multiple regression model summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.357	.127	.119	420.881

The R Square value of 0.127 did not represent and meant that the model only explained 12.7% of the variance in total week time.

**Table 5.18: Regression ANOVA test results**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5120929.556	2	2560464.778	14.454	.000
	Residual	35073841.498	198	177140.614		
	Total	40194771.055	200			

The ANOVA test results confirmed that the model has statistical significance.

**Table 5.19: Regression coefficients**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations			Collinearity Statistics		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF	
1	(Constant)	418.244	29.687		14.089	.000	359.701	476.786						
	Interact factor score	127.469	29.761	.284	4.283	.000	68.781	186.158	.284	.291	.284	1.000	1.000	
	Use factor score	96.727	29.761	.216	3.250	.001	38.039	155.416	.216	.225	.216	1.000	1.000	

Both of the independent variables tested in the multiple regression were found to be significant. The Beta values for the standardized coefficients indicated that Interact had the greatest effect on the model.



## Conclusion

Proposition 3 is not supported as a result of the violations to the regression model assumptions.

Proposition 4a: The ability to co-create fosters product/service usage.

Proposition 4b: The ability to co-create fosters brand usage.

Logistic regression was used as it allows for an assessment of how well a set of predictor variables (Interact and Use factors) predicts or explains a categorical dependent variable (product/service and brand usage). In addition Logistic regression was considered to be appropriate in order to obtain an indication of the adequacy of the model through an assessment of “goodness of fit”. The PASW18 procedure labelled Binary Logistic was used to perform logistic regression with a dichotomous dependent variable (product/service and brand usage). This was done after the dependent variable data was recoded from a categorical variable with many categories (representing various products/services and brands) into a categorical variable with only two categories represented by “1” = use and “0” = not use. The recoding was considered to be appropriate as the logistic regression tests were performed in order to assess whether a product/service or brand was being used by respondents or not. As such the type of product/service or brand was not relevant and the variables were recoded into binary form to represent usage or non-usage.

## Findings

Proposition 4a: The ability to co-create fosters product/service usage.

The full model containing all predictors was statistically significant ( $p < 0.05$ ) with a Chi-square value of 23.360 and two degrees of freedom which indicated that the model was able to distinguish between respondents that used and did not use a product/service. The model explained between 11% (Cox and Snell R square) and 15% (Nagelkerke R square) of the variance in usage status, and correctly classified 67.2% of the cases.

**Table 5.20: Proposition 4a Omnibus tests of model coefficients**

		Chi-square	df	Sig.
Step 1	Step	23.360	2	.000
	Block	23.360	2	.000
	Model	23.360	2	.000

As indicated in the table below only one of the independent variables made a statistically significant contribution to the model (Use). The strongest predictor of product/service usage was Use, which recorded an odds ratio ( $\text{Exp}(B)$ ) of 2.158. This meant that a respondent that scored highly in the Use factor was 2.158 times more likely to make use of a product/service, controlling for all other factors in the model.

**Table 5.21: Proposition 4a variables in the equation**

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
								Lower	Upper
Step 1a	Interact_factorscore	.013	.160	.007	1	.935	1.013	.740	1.387
	Use_factorscore	.769	.174	19.583	1	.000	2.158	1.535	3.033
	Constant	.622	.157	15.630	1	.000	1.863		

Conclusion

Proposition 4a is partially supported.

Proposition 4b: The ability to co-create fosters brand usage.

The full model containing all predictors was not statistically significant ( $p < 0.05$ ) with a Chi-square value of 3.651 and two degrees of freedom which indicated that the model was not able to distinguish between respondents that used and did not use a brand. The model explained between 1.8% (Cox and Snell R square) and 4.5% (Nagelkerke R square) of the variance in usage status, and correctly classified 93% of the cases.

**Table 5.22: Proposition 4b Omnibus tests of model coefficients**

		Chi-square	df	Sig.
Step 1	Step	3.651	2	.161
	Block	3.651	2	.161
	Model	3.651	2	.161

As indicated in the table below none of the independent variables made a statistically significant contribution to the model. The strongest predictor of brand usage was Use, which recorded an odds ratio (Exp(B)) of 1.678. This meant that a respondent that

scored highly in the Use factor was 1.678 times more likely to make use of a brand, controlling for all other factors in the model.

**Table 5.23: Proposition 4b variables in the equation**

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
								Lower	Upper
Step 1a	Interact_factorscore	-.208	.262	.634	1	.426	.812	.486	1.356
	Use_factorscore	.518	.308	2.818	1	.093	1.678	.917	3.072
	Constant	-2.718	.309	77.269	1	.000	.066		

### Conclusion

Proposition 4b is not supported.

#### 5.4. Summary of proposition testing results

Proposition	Test performed	Test result
<u>Proposition 1:</u> Co-creation is present on the online cycling forum, <a href="http://www.thehubsa.co.za">www.thehubsa.co.za</a>	One-sided t-test	Proposition 1 is supported in three of the four components
<u>Proposition 2:</u> Different Web 2.0 applications available on <a href="http://www.thehubsa.co.za">www.thehubsa.co.za</a> determine/correlate with the individual members' ability to co-create	Pearson Correlation	There is some support for proposition 2.
<u>Proposition 3:</u> Increased perceived co-creation on the site results in an increase in time spent on the site	Multiple regression	Proposition 3 is not supported as a result of the violations to the regression model assumptions.
<u>Proposition 4a:</u> The ability to co-create fosters product/service usage.	Logistic regression	Proposition 4a is partially supported.
<u>Proposition 4b:</u> The ability to co-create fosters brand usage.	Logistic regression	Proposition 4b is not supported.

## Chapter 6 – Discussion of results

### 6.1. Introduction

The commentary that follows is intended to deal directly with the research objectives for this study. Specifically the test results outlined in Chapter 5 are discussed in relation to the literature review presented in Chapter 2. The sample used in this particular study has also been discussed in order to add some context. Any discrepancies that arose between the existing literature and the results of this study are noted and commented on in this section.

### 6.2. Addressing the research propositions

#### 6.2.1. Proposition 1: Co-creation is present on the online cycling forum,

[www.thehubsa.co.za](http://www.thehubsa.co.za)

#### Difficulty in enacting and measuring co-creation

Prahalad and Ramaswamy (2004) developed the building blocks for the interactions between suppliers and customers that are necessary for the process of co-creation and defined these as dialogue, access, risk-benefits and transparency (DART). They found that the essence of the co-creation process is the company-customer interaction which results in value creation (Prahalad and Ramaswamy, 2004). DART scales for this study were developed based on a consideration of the specific online activities and behaviours that contributed to the four DART building blocks. This may have led to an element of researcher bias in that the survey questions which were used as the scale items for measuring the DART scale were based on the researcher's own beliefs and frame of reference as a regular user of the website being tested (Saunders, Lewis and Thornhill, 2009). More importantly, the number of effective scale items should be

increased in order to improve the internal reliability of the scales designed for this study (Hair et al, 1998). The results of the internal consistency tests that were ran for the DART co-creation scale confirmed this in that only the Dialogue scale was found to be reliable and this particular scale consisted of significantly more scale items (12) than the other scales (Access – 3, Risk-benefits – 3 and Transparency – 2). An increase in the number of scale items should have a positive effect on the reliability of the scales and this is supported by Pallant (2007) that acknowledged that scales with fewer items tend to have lower Cronbach alpha values. However, Hair et al (1998) warns that because increasing the number of scale items will result in an increase in reliability of the scale more stringent requirements should be implemented when addressing scales with many items.

The normality of the DART co-creation scales was considered to be adequate based on a review of the histograms and the normal probability plots. The internal consistency of the DART scales, as measured by the calculation of the Cronbach's alpha, revealed that only the Dialogue scale was reliable with a recorded score of 0.727. It was noted that the score improved to 0.783 when the item "log on as a guest" was removed from the scale. All of the remaining DART scales being Access (0.582), Risk-benefits (0.526 and improved to 0.538 by removing an item) and Transparency (0.513) were not found to be reliable scales based on the calculation of Cronbach alpha scores. In the case of scales with few items an alternative test of reliability is based on the calculation of inter-item correlation and the optimal range for inter-item correlation per Briggs and Cheek (1986) was found to be between 0.2 and 0.4. The calculated inter-item correlation for each of Access, Risk-benefits and Transparency indicated that the scales were in fact

reliable and that the low Cronbach alpha scores could be explained by the small number of scale items used in the survey. This finding reconfirmed the need to add to the existing scale items in this study in order to improve the reliability as measured by Cronbach's alpha.

The results of the Exploratory factor analysis (PCA) performed on all the items that made up the DART co-creation scale revealed the presence of two factors that made up 40.9% of the total variance. The Interact component explained 28.4% of the variance while the Use component explained 12.5% of the variance. The two factors identified were based on the results of the PCA and bearing in mind the objective of achieving model parsimony without omitting critical predictor variables (Hair et al, 1998). Practically this was achieved in the study by applying Kaiser's criterion (Pallant, 2007) and initially only retaining factors with an eigenvalue of 1.0 or more for further investigation. Catell's scree test (Pallant, 2007) was then applied in order to isolate those factors that contribute most to the explanation of the variance. The Varimax rotation confirmed the existence of two uncorrelated factor solutions that were represented by each of the variables loading strongly on only one of the components. Based on the above, the two factor solution was considered most appropriate for use in the regression testing that followed and was used in place of the DART co-creation scales.



### A possible link between co-creation and flow

A consideration of the antecedents of flow per the work of Hoffman and Novak (1996) highlighted the possible link between the Interact component as well as the secondary antecedent of interactivity and the impact that each item has on co-creation and online flow respectively. Similarly the Use component and the impact on co-creation appeared to be related to the skill and challenge primary antecedent in the online flow model of Hoffman and Novak (1996). Skill and challenge in the context of flow related to the balance required between the level of a user's online skills and the challenge (complexity) presented by the online environment. Hoffman and Novak (1996) found that skill and challenge was required to be evenly matched in order for flow to occur. A parallel can be drawn in the current study based on the Use component, which relates to a user's ability to make use of the information and content provided, and the resultant ability to co-create. The importance of flow, being an enjoyable and desirable state that consumers seek to achieve (Hoffman and Novak, 1996), in the online environment and the close association with the customers' inclination and ability to co-create provides further evidence for the use of the Interact and Use components rather than the individual scales.

A later finding by Novak et al (2000) suggested that flow was greater for respondents that used the Web for experiential uses such as online chat and entertainment compared to task orientated uses like work and performing searches. The sample of respondents surveyed in the current study made use of a specific cycling related online social network and this may have contributed to an enhanced experience of flow, and possibly co-creation, than if a task orientated website's users were surveyed. However,

a later paper by Novak, Hoffman and Duhachek (2003) contradicted the earlier finding of Novak et al (2000) in that the authors found more evidence for flow occurring in relation to task orientated than experiential activities. The current study appeared to lend more support to the primary contention of Novak et al (2000) that flow was greater for respondents that used the Web for experiential uses. This was based on an assessment of the scale items that made up the survey which focused almost entirely on the experiential or entertainment aspects of the website as opposed to the task orientated activities such as entering and finding out about bike races.

### Summary of proposition 1

The results of the one-sided t-test confirmed that the mean value for each of the Dialogue, Access and Transparency scales was greater than the test statistic of three (which represented the middle value of the five point Likert-type rating scale) based on a 95% confidence interval. This finding provided support for proposition 1 and confirmed that co-creation, as measured in terms of Dialogue, Access and Transparency, was indeed taking place on the website. This echoed the work of Sheth et al (2000) that foresaw a closer level of interaction between the supplier and customer and noted that the internet will serve as a key platform for this interaction. All of the Dialogue, Access and Transparency variables are necessary in order to establish the desired level of interaction and allow the customer to connect to the firm's offerings (Prahalad and Ramaswamy, 2004) via the internet.

The Risk-benefit scale was found to have a true mean of less than the test value of three at a 95% confidence level. The impact of this finding was that Risk-benefits were

not contributing to the notion of co-creation taking place on the website. A consideration of the risks and benefits relating to a particular choice of product or service can perhaps be traced back to the information processing model that views consumers as logical thinkers that make decisions in order to solve problems (Holbrook and Hirschman, 1982). Based on this line of thought, an assessment of the risks and benefits relating to a product/service would merely assist in arriving at a choice rather than facilitating a process of co-creation. This is supported by the fact that the information processing model gave way, for a certain stream of research, to the experiential view of Holbrook and Hirschman (1982) that ultimately led to a consideration of the customer experience and co-creation. This could possibly explain why the Risk-benefit scale does not contribute to the concept of co-creation taking place on the website as the notion of an assessment of risks and benefits contributes to a choice process rather than a co-creation process.

The data also revealed the existence of two components that appeared to have a fairly significant impact on the co-creation construct. The Interact component explained 28.4% of the variance and related back to the work of Sheth et al (2000) that referred to the interaction between supplier and customer and the importance of the internet in understanding and interpreting consumer needs and wants. The second component, Use, explained 12.5% of the variance and highlighted the link between the ability to make use of content and information in order to co-create. The increasing popularity of the internet as well as the fact that the internet has now provided equal access to information (Prahalad and Ramaswamy, 2000) provided further evidence of the relative importance of the use component as a factor that impacts the concept of co-creation.

The two components identified could lay the foundation for developing a co-creation scale in future research and have been used, in place of the scales developed in this paper, in order to test the co-creation propositions that required multiple regression testing.

**6.2.2. Proposition 2: Different Web 2.0 applications available on [www.thehubsa.co.za](http://www.thehubsa.co.za) determine/correlate with the individual members' ability to co-create**

Issues with SLATES Web 2.0 scale

The components of Web 2.0 applications were developed into scales by the researcher based on the McAfee's (2006) SLATES framework that consisted of Search, Links, Authoring, Tags, Extensions and Signals. SLATES scales for this study were developed based on a consideration of the specific Web 2.0 applications that were available on [www.thehubsa.co.za](http://www.thehubsa.co.za). For this reason no scale was developed for either the Tags or Extensions component of SLATES framework as the website tested did not make use of this specific technology. The results of the internal consistency tests that were ran for the SLATES Web 2.0 scale confirmed that only the Authoring scale was found to be reliable and this particular scale consisted of significantly more scale items (6) than the other scales (Search – 1, Links – 4 and Signals – 2). In the extreme case of the Search scale, that only consisted of one scale item, a Cronbach alpha score could not even be calculated. An increase in the number of scale items should have a positive effect on the reliability of the scales and this is supported by Pallant (2007) who acknowledged that scales with fewer items tend to have lower Cronbach alpha values. However, Hair et al (1998) warns that because increasing the number of scale items will

result in an increase in reliability of the scale more stringent requirements should be implemented when addressing scales with many items.

The normality of the SLATES Web 2.0 scales was considered to be adequate based on a review of the histograms and the normal probability plots. The internal consistency of the SLATES scales, as measured by the calculation of the Cronbach's alpha, revealed that only the Authoring scale was reliable with a recorded score of 0.765. All of the remaining SLATES scales being Search (not possible to calculate as only one scale item), Links (0.619) and Signals (0.478) were not found to be reliable scales. In the case of scales with few items an alternative test of reliability is based on the calculation of inter-item correlation and the optimal range for inter-item correlation per Briggs and Cheek (1986) was found to be between 0.2 and 0.4. The calculated inter-item correlation for both Links and Signals indicated that the scales were in fact reliable and that the low Cronbach alpha scores could be explained by the small number of scale items used in the survey. This finding reconfirmed the need to add to the existing scale items in this study in order to improve the reliability as measured by Cronbach's alpha.

The results of the Exploratory factor analysis (PCA) performed on all the items that made up the Web 2.0 scale revealed the presence of two factors that made up 41.1% of the total variance. The Creating component explained 27.3% of the variance while the Sharing component explained 13.8% of the variance. The two factors were identified based on the results of the PCA and bearing in mind the objective of achieving model parsimony without omitting critical predictor variables (Hair et al, 1998). Practically this was achieved in the study by applying Kaiser's criterion (Pallant, 2007) and initially only retaining factors with an eigenvalue of 1.0 or more for further investigation. Catell's

scree test (Pallant, 2007) was then applied in order to isolate those factors that contribute most to the explanation of the variance. The Varimax rotation confirmed the existence of two uncorrelated factor solutions that were represented by each of the variables loading strongly on only one of the components. Based on the above, the two factor solution was considered most appropriate for use in regression testing.

### Strong influence of Authoring Web 2.0 application

The results of the Pearson Correlation supported the strong influence that the Authoring Web 2.0 application has on the ability to co-create in terms of creating a Dialogue and facilitating Transparency. This finding is considered to be expected based on the existing literature and specifically the view of Prahalad and Ramaswamy (2004) that stressed the importance of connecting the customer to the firm's offerings. In terms of the Web 2.0 tools made available to the customer it is clear that the ability to author content is central to the need to establish a dialogue that is transparent and in so doing co-create.

A major issue around the ability to author or create content, however, is related to trust (Hoffman, Novak and Peralta, 1999) and the lack of faith that online consumers have about the access to their personal information (Hoffman et al, 1999). This concern is addressed by the Transparency component of the co-creation framework. The correlation findings appear to suggest that the co-creation element of transparency is facilitated through the process of providing tools to a consumer that allow them to create content that is transparent.

## Summary of proposition 2

The strong influence of only the Authoring component of the SLATES Web 2.0 framework may be explained by the sample surveyed. Although there was evidence of a medium positive correlation between the Search, Links and Signals components of the SLATES Web 2.0 framework this may have been impacted by the nature of the website users that formed the basis for the study. The niche nature of the website as a cycling specific social network lends itself towards the sharing of cycling related information (the website also provides a very active secondhand market for the buying and selling of goods) which relies heavily on the ability of users to generate (author) content. The test results provided evidence that the Authoring element of the framework has the biggest impact on the ability to co-create on the particular website. The findings of the current study have contributed to the existing co-creation literature in that the importance of the impact of Authoring in facilitating co-creation has moved the body of knowledge on co-creation from a theoretical framework to a practical insight into how co-creation actually takes place.

Interestingly, Okleshen and Grossbart (1998) found that active users (“posters”) of online communities felt a stronger sense of membership than less active users. The impact of self-selection (volunteer) bias, as discussed in Chapter 4, may have had an influence on the survey results in that members with a stronger sense of membership may have been more likely to respond to the survey and their preference towards generating content (posting) could have influenced the findings in relation to proposition two.

The data also revealed the existence of two components related to Web 2.0, Creating and Sharing, identified in the PCA that appeared to have a fairly significant impact on the co-creation construct. In their work on the concept of co-creation, Prahalad and Ramaswamy (2004) credited the advances in technology, and specifically the internet, that has resulted in increased access to information and provided customers with the ability to communicate directly with each other. Hoffman and Novak (1996) in their work on flow in computer-mediated environments pioneered the development of a peer-to-peer communication network in which consumers can communicate directly with each other. In this respect consumers are now able to choose the companies that they would like to interact with based on their own views of value creation (Prahalad and Ramaswamy, 2004). The existing literature therefore supports the identification of the Creating and Sharing components as key elements of a co-creation framework based on the updated view that Prahalad and Ramaswamy (2004) have of the consumer as being informed, connected and empowered. Additional support for the emergence of the Creating and Sharing components of co-creation was found in the conceptual model for the co-creation of value developed by Payne, Storbacka and Frow (2008) that recognized the importance of establishing processes in co-creation. The process-based value co-creation framework of Payne, Storbacka and Frow (2008) consisted of three main components being customer value-creating processes, supplier value-creating processes and encounter processes. The factors identified in the existing study (Creating and Sharing) are considered to be key elements to all of the three processes identified above as they are necessary for both parties (customers and suppliers) to create and share content and therefore value. On this basis it is submitted that both of



the identified components could potentially form a better foundation for constructing a Web 2.0 scale in future research.

### **6.2.3. Proposition 3: Increased perceived co-creation on the site results in an increase in time spent on the site**

#### Weak regression model and data limitations

The two co-creation components referred to as Interact and Use were considered to better represent the co-creation construct and a decision was made to use these components in the regression model in place of the DART co-creation scales which did not prove to be reliable in terms of the Cronbach alpha scores. The results of the multiple regression analysis used to determine the impact of the independent variables, being the co-creation components identified in the factor analysis (Interact and Use), on the total time per week (total week time) spent on the website (dependent variable) provided evidence of a number of violations to the multiple regression assumptions specifically with regards to nonlinearity and heteroscedasticity. The impact was that the regression model was found to have a weak effect and only explained 12.7% of the variance in total week time. The fact that the model had statistical significance at the 95% confidence interval was irrelevant as the effect was weak. The independent variable with the greatest effect on the model was Interact and both of the independent variables tested in the regression model were found to be significant.

Lesser and Fontaine (2002) found that one of the benefits of creating online communities was that companies were able to attract repeat visits to their websites. In doing so this would increase the time spent on a particular website. As the creation of

an online community is reliant on the ability of its members to co-create it is reasonable to assume that there is a relationship between the perceived ability to co-create and the time spent on a particular site, however, data limitations prevented verification of this.

The findings of Fischer and Bristor (1996) in relation to online communities noted that internet consumption communities were self-selective, voluntary in nature and easy to join and leave. The implication of this concept of fluidity on the internet is that online consumers have the power to choose which websites they use and interact with. In doing so the websites that they choose are those that they co-create with and spend time on. The proposition that was tested is therefore supported by the theory on the Use component, however, although the testing provided evidence of significance the effect of the Use component was low.

The fact that the model found that the Interact independent variable had the greatest effect is somewhat supported by the earlier work of Okleshen and Grossbart (1998) and their findings that active website users place more value on group information and were more likely to act on the information and affect behaviour. The finding implied that developing group information, through a process of interaction, resulted in more value being placed on that content which was more likely to result in action or behaviour (more time spent on the site).

A consideration of the sample surveyed and nature of the specific online cycling community highlights the importance of information sharing on the website. The surveyed online community is based on the communal sharing of knowledge related to the broad topic of cycling and consists of forums such as technical advice, race reports,

photo sharing and the popular buying and selling platform. From a practical perspective the ability to Interact and Use (the website and/or tools provided) as a means of co-creating would be expected to have a positive relationship with the amount of time spent on the website.

### Summary of proposition 3

The failure of the multiple regression model indicated that the website users' perception of the extent of co-creation and the link to an increase in time spent on the website cannot be conclusively resolved in the current study.

#### **6.2.4. Proposition 4a: The ability to co-create fosters product/service usage**

The model was statistically significant and, based on the Interact and Use co-creation components (predictor variables), able to distinguish between respondents that used and did not use a product/service. Although the model was found to explain between 11% and 15% of the variance in usage status and correctly classified 67.2% of the cases, the only independent variable that made a statistically significant contribution to the model was the Use component. At this point it was interesting to note the significance of the Use component, although the effect was weak, in the regression model tested in relation to the time spent on the website (proposition three). The link between the Use component may have suggested the existence of a relationship between time spent on the website (proposition three) and product/service usage (proposition four). The strongest predictor of product/service usage was also found to

be the Use component. The proposition was therefore only adequate to the extent that Use (in the co-creation sense) resulted in product/service usage.

The literature on service-dominant marketing (Vargo and Lusch, 2004) not only emphasised the need to move from a goods-dominant view of marketing to a service-dominant view, but also led marketers to consider the importance of the customer and establishing relationships with the customer. The service-dominant view is characterised by the exchange of competencies and the co-creation of value with consumers. The importance of the Use component of a co-creation framework is emphasised in the service-dominant marketing literature as a key feature in the process of attracting customers in order to establish relationships and foster co-creation. Customers are required to make use of a website and the particular co-creation elements that are provided in order to facilitate the product/service usage.

Frow and Payne (2007) developed the notion of the “perfect customer experience” in the cases that they studied and concluded that the active participation of the customer, through a process of co-creation, was required in order to achieve the stated goal. In terms of the co-creation components the active participation of the customer would depend on both the Interact and Use component. The existing literature therefore appeared to support the proposition, however, the study results only supported the statistical significance of the Use component.

Further investigation of the Varimax rotation performed for both the Interact and Use components provided some insight into the variables that loaded against each of the co-creation components. In the case of the Interact component the variables related to the

ability of members to interact with each other (either as members or guests) as well as with the administrator. In addition, the Interact component was characterized by variables that spoke to the ability of members and guests to generate topics and post responses to existing topics. The Interact component was more relevant to a process of communication and contribution between members and guests and would not necessarily result in the usage of a particular product or service. The Use component on the other hand was more closely related to variables that involved the use of shared information, the ability to make decisions based on shared information as well the buying of products/services. Clearly the Use component has a more direct impact on product/service usage and was expected to be more significant and have a greater effect in the regression model based on an understanding of the data.

#### Summary of proposition 4a

The impact of the co-creation model on product/service usage was statistically significant, however, the effect was weak. On this basis the model was not meaningful. The significance of the Use independent variable in the model presented an interesting relationship that is considered to be fairly intuitive based on a closer understanding of the underlying data as discussed above. The existing literature appeared to support the proposition although the study only partially supported the proposition.

#### **6.2.5. Proposition 4b: The ability to co-create fosters brand usage**

The model tested was not statistically significant and not able to distinguish between respondents that used and did not use a brand. In addition, none of the independent

variables made a statistically significant contribution to the model. Testing performed on the proposed model revealed that it was not adequate and that none of the co-creation components had an impact on the extent of brand usage on the website.

Consumer research under the information processing model was most interested in the choice process and the impact that this had on purchase decisions (Holbrook and Hirschman, 1982). It followed that because choices were largely dependent on brands, brand purchase decisions were considered to be an important behavioural outcome under the information processing model (Holbrook and Hirschman, 1982). This proposition was developed for testing based on a consideration of the above finding as brand purchase decisions (usage) is the ultimate indicator of consumer preference. The proposition therefore sought to understand the extent to which the co-creation framework predicted or explained the extent of brand usage. Based on the results of the logistic regression testing, co-creation was not found to foster brand usage on the website tested, possibly due to scaling and measurement concerns.

Research in the online environment by Goode and Harris (2007) looked at the online behavioural intentions of a group of consumers based on an experience with a particular website. The findings revealed that the perceived online reputation had the biggest impact on consumers' behavioural intentions (Goode and Harris, 2007). In the context of brand usage on a particular website, the conclusion of Goode and Harris (2007) was that reputation and trustworthiness are critically important in an e-commerce environment. It is submitted that perhaps a model testing the relationship between reputation and trustworthiness (as the independent variables) and brand usage (dependent variable) could have returned better significance.

## Online communities and brands

The impact of online communities (such as [www.thehubsa.co.za](http://www.thehubsa.co.za)) on brand commitment and subsequent customer behaviour was researched by Jae et al (2008). Their findings confirmed the direct influence that online communities have on brand commitment and uncovered that customers that are members of online communities have a stronger brand commitment than those that are not members (Jae et al, 2008). It seemed logical then that the creation of online communities would be a successful way to build brand loyalty and usage. However, the testing of the proposition that co-creation fosters brand usage was unable to validate a model that was statistically significant in the current study.

The lack of support for the proposition may be explained by the sample surveyed and the fact that the website serves as a social networking platform for cyclists and does not have brands that are specifically related or linked to the website. The business model of the website is to rely on advertising revenue from suppliers within the cycling industry that are provided with access to their target market. The website users are therefore exposed to a number of different and competing brands which may explain the inability to establish a relationship between co-creation on the website and brand usage as the two constructs are not directly linked. Furthermore an element of researcher bias may have also contributed to the lack of support for the proposition in that the researcher specified a subjective and incomplete list of brands in the questionnaire (with an option for “other brands”) in order to test brand usage. The low response rate of 1.8% may have also played a role.

### Summary of proposition 4b

The impact of the co-creation model on brand usage was not meaningful in the context of this specific study. This finding appeared to contradict the literature reviewed that supported the relationship between online communities, co-creation and brand usage. On the subject of brand usage, the literature supported the relationship between reputation (trust) and the behavioural intentions of customers and a model along these lines may have proved to be more effective.



## Chapter 7 – Conclusion and recommendations

### 7.1. Academic contributions

Although the purpose of the research was to study co-creation in a specific online context and not the development of scales, the scales designed in the study were found to be reliable for both the Dialogue element of co-creation as well as the Authoring element of Web 2.0 applications. These two scales can therefore be useful in a future scale development process. Perhaps more significantly, an analysis of the data revealed the existence of a new two factor solution related to the separate co-creation and Web 2.0 applications constructs. In this respect the Interact and Use components (co-creation) as well as the Creating and Sharing components (Web 2.0 applications) could provide the foundation for construct validity for more comprehensive scales. The finding that the two factor solutions explained 40.9% of the total variance for the co-creation scale and 41.1% of the total variance for the Web 2.0 applications scale confirms the importance of these components in future studies on the specific topics. The finding that the Authoring element of the Web 2.0 applications framework has the biggest impact on the ability to co-create has contributed to the co-creation literature by providing a practical insight into what is required for a customer to actually co-create.

The proposed positive relationship between perceived co-creation and time spent on the website (proposition three) was not conclusively resolved in the study due to violations of the multiple regression assumptions. The impact of the Interact and Use components of co-creation on the amount of time spent on a website do, however, appear significant and the relationship is worth further exploration. Testing of the relationship between co-creation and product/service usage (proposition 4a) also

revealed the significant contribution of the Use component of the co-creation framework. The link that the Use component facilitates in the above propositions may suggest the existence of a relationship between time spent on the website (proposition three) and product/service usage (proposition 4a). Finally, the impact of co-creation on brand usage (proposition 4b) was not meaningful in the current study in spite of the fact that the proposition appears to be supported in the existing literature. This could have been a result of excluding the trust construct from the study. In this respect a model testing the relationship between trust (as one of the independent variables) and brand usage (dependent variable) could provide better results.

## **7.2. Limitations of the research and suggestions for future research**

### **Research methodology**

The methodology was limited as a result of using a non-probability sample which meant that the results are not generalisable or representative of the population tested. Similarly the results relate only to co-creation and the consequences of co-creation in the context of the specific website tested. Future research can be undertaken in order to test the results of this study in a different online co-creation context.

## Design of the research instrument

An element of researcher bias was present in the design of the instrument in that:

- Both the co-creation and Web 2.0 applications scales were developed by the researcher based on his experience as a regular user of the website being tested.
- The researcher specified a subjective and incomplete list of products/services and brands in the questionnaire (although an option for “other” was included) in order to test product/service and brand usage.

The use of customer focus groups in order to develop the questionnaire may have been a more appropriate approach. The low response rate of 1.8% may have also played a role in the lack of data variance that contributed to the normality issues experienced.

In designing the survey questionnaire, the number of effective scale items should be increased as a means of improving the internal reliability. A clear shortcoming of the current study was the lack of scale items used to measure certain of the scales and specifically the extreme case of the Search scale that consisted of only one scale item.

## Study sample

The response rate of 1.8%, although not unrealistic for an online survey, was thought to be low and may have contributed to insufficient variance in the data collected. An extension of the data collection period could possibly improve the response rate, however, it will not change the fact that the sample is not representative and could actually skew the data further. A change in the sampling method to a closed web-based

survey, by using passwords to restrict access, could prevent unwanted access to the research and make the results more valid.

The impact of self-selection (volunteer) bias, as discussed in Chapter 4, may have had an influence on the survey results in that members with a stronger sense of membership may have been more likely to respond to the survey and their preference towards generating content (posting) could have influenced the findings.

As the website tested serves as a social networking platform for cyclists, it advertises brands and does not have brands that are specifically related or linked to the website. This is essentially due to the fact that the website functions as an information portal for cyclists and does not sell a specific product or service that is linked to a brand. The website users are therefore exposed to a number of different and competing brands - displayed by various advertisers - which may explain the inability to establish a relationship between co-creation on the website and brand usage as the two constructs are not directly linked.

The study related to a niche cycling online social network that functions mainly as an information sharing portal and an exchange to buy and sell secondhand cycling goods. It would be fruitful to conduct a similar study on a website that actually allows the user to co-create in the development of a personalised product or service. This would allow for a better study of the link between the customer input into a product or service (as co-creator), the time dedicated to such a process and the actual usage of the output.

## Scale issues and recommendations for future scale development

As the objectives of the study were to determine if co-creation was taking place on a specific website and to assess the impact of co-creation, it was necessary to construct scales. The purpose of the study, however, was not to develop and validate scales. It is submitted that the development of the scales in the current study may have led to an element of researcher bias in that the survey questions (which were used as the scale items for measuring the scales) were based on the researcher's own understanding of the features of the website being tested (Saunders, Lewis and Thornhill, 2009). More importantly, the number of effective scale items should be increased in order to improve the internal reliability of the scales developed for this study (Hair et al, 1998).

## Context and scope of the study

The possible link between co-creation and flow (Hoffman and Novak, 1996), that emerged due to the discovery of the Interact and Use components, presents an interesting dimension and possible area for future research. The current study did not resolve the existing debate on whether flow is greater for those that make use of websites for experiential or task orientated studies. The link between co-creation and flow and whether co-creation represents an experiential or task orientated activity (as well as the impact on flow) is an area for future research.

### **7.3. Managerial implications**

The findings have a number of implications for business and specifically relate to the two factor solutions discovered in relation to the co-creation and Web 2.0 applications constructs. With respect to the current theoretical concept of co-creation, the Interact and Use components provide a more practical consideration of the tools needed to facilitate co-creation. The Web 2.0 tools that complement co-creation are also more practically represented by the Creating and Sharing components. The importance and impact of the ability of a user to Author content on a website is of particular practical significance. Providing this functionality to a customer may be the key to the missing “how to” element of co-creation.

The link between the Use component and time spent on the website as well as product/service usage suggests the existence of a relationship between the two constructs. The managerial implication would be that stimulating a co-creation environment results in increased time spent on a website and increased product/service usage.

In the context of the particular website tested product/service usage appears to be a consequence of co-creation, however, brand usage does not occur as a result of co-creation. The ability of a social networking website, such as [www.thehubsa.co.za](http://www.thehubsa.co.za), to encourage general product/service usage therefore appears to be the main attraction to advertisers. Advertisers looking to build their brands may not necessarily obtain the same benefits from the website.

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## Appendices

### APPENDIX A: BLANK QUESTIONNAIRE

#### "The Hub SA Survey"

##### RESEARCHER'S STATEMENT

I am asking you to complete a survey as part of a research study. The purpose of this information sheet is to give you the information you will need to help you decide whether to be in the study or not. **It IS NOT part of the actual study.** This process is called "informed consent." Please read the form carefully.

##### DESCRIPTION/PURPOSE OF RESEARCH

The purpose of this study is to assess the impact of Web 2.0 applications on online co-creation and the resulting affect on website usage and brand loyalty. The website to be studied is [www.thehubsa.co.za](http://www.thehubsa.co.za) with a view to understand which Web 2.0 applications are used most for co-creation and what impact this has on website usage and brand loyalty.

##### DATA COLLECTION AND ANALYSIS

All data collected as part of this research will remain confidential. Matching of data will occur through the use of a confidential number. Only the researcher will see your individual data and the researcher will not be able to associate the data with a specific individual.

##### RISKS OR DISCOMFORTS

There are no foreseeable risks or discomforts associated with completing this survey.

##### ALTERNATIVES TO PARTICIPATION

You may choose not to participate in this study. You may withdraw from the study at any point. You are not obliged to answer all the questions.

##### BENEFITS OF PARTICIPATION

The main benefit of participation is to provide feedback with regards to the current Web 2.0 applications available on the website and specifically the usefulness of these tools. The research is intended to provide a platform for members to rate the current co-creation abilities of the website. The results of the research will be presented to the founder and owner of The Hub SA and may result in possible changes or upgrades to the website.

## CONSENT

By marking that you agree to participate, you give your permission for information gained from your participation in this study to be published in scholarly management literature, discussed for educational purposes, and used generally to further management science. You will not be personally identified; all information will be presented as anonymous data.

- I agree and choose to participate in this study.
- I do not agree and choose NOT to participate.

## "The Hub SA Survey"

This survey is divided into 4 sections. Each section contains questions that will aid me to get a deeper insight into co-creation and the impact of co-creation on [www.thehubsa.co.za](http://www.thehubsa.co.za)

Please answer the questions in each section as thoroughly and conscientiously as possible.

The four areas that will be examined in this research study are as follows:

### **SECTION 1: CO-CREATION**

### **SECTION 2: WEB 2.0 APPLICATIONS ON WWW.THEHUBSA.CO.ZA**

### **SECTION 3: USAGE**

### **SECTION 4: BEHAVIOUR AND DEMOGRAPHICS**

## SECTION 1: CO-CREATION

Below is a series of statements. I would like you to indicate, on a scale of 1 to 5, where '1' means 'not do at all' and '5' means 'do a lot' the extent to which you do the following on the website [www.thehubsa.co.za](http://www.thehubsa.co.za).....

	1	2	3	4	5
Respond to posts that interest me	Not do at all	Hardly	Slightly	Often	Do a lot
Start a post based on a topic of my choice	Not do at all	Hardly	Slightly	Often	Do a lot
Interact with the website administrator	Not do at all	Hardly	Slightly	Often	Do a lot
Make use of user generated content	Not do at all	Hardly	Slightly	Often	Do a lot
Make use of moderator generated content	Not do at all	Hardly	Slightly	Often	Do a lot
Generate my own content	Not do at all	Hardly	Slightly	Often	Do a lot
Read the contributions of others	Not do at all	Hardly	Slightly	Often	Do a lot
Flag topics that I would like to return to	Not do at all	Hardly	Slightly	Often	Do a lot
Log on as a member	Not do at all	Hardly	Slightly	Often	Do a lot
Log on as a guest	Not do at all	Hardly	Slightly	Often	Do a lot
Start a new topic	Not do at all	Hardly	Slightly	Often	Do a lot

Post a response to an existing topic	Not do at all	Hardly	Slightly	Often	Do a lot
Chose a topic of interest from the list of active forums	Not do at all	Hardly	Slightly	Often	Do a lot
Make a decision based on information posted by other members	Not do at all	Hardly	Slightly	Often	Do a lot
Buy goods and services that I customise through my interaction with the website	Not do at all	Hardly	Slightly	Often	Do a lot
Benefit from the interaction between administrator and users	Not do at all	Hardly	Slightly	Often	Do a lot
Use the information in posts to make decisions	Not do at all	Hardly	Slightly	Often	Do a lot
Post information on both the risks and benefits relating to a particular topic	Not do at all	Hardly	Slightly	Often	Do a lot
Freely voice my opinion on a specific topic	Not do at all	Hardly	Slightly	Often	Do a lot
Report posts when I think the comments are offensive	Not do at all	Hardly	Slightly	Often	Do a lot



## SECTION 2: WEB 2.0 APPLICATIONS ON WWW.THEHUBSA.CO.ZA

Below is a series of statements. I would like you to indicate, on a scale of 1 to 5, where '1' means 'not use at all' and '5' means 'use a lot' the extent to which you make use of the following tools on the website [www.thehubsa.co.za](http://www.thehubsa.co.za).....

	1	2	3	4	5
The search function to search for specific information	Not use at all	Hardly	Slightly	Often	Use a lot
Links to jump between information on different web pages	Not use at all	Hardly	Slightly	Often	Use a lot
Links in the site menu to access information on other websites	Not use at all	Hardly	Slightly	Often	Use a lot
The Twitter link	Not use at all	Hardly	Slightly	Often	Use a lot
The Facebook link	Not use at all	Hardly	Slightly	Often	Use a lot
The tool to upload photos in the photo gallery	Not use at all	Hardly	Slightly	Often	Use a lot
The tool to upload photos in forum posts	Not use at all	Hardly	Slightly	Often	Use a lot
The private messenger function	Not use at all	Hardly	Slightly	Often	Use a lot
The fast reply function	Not use at all	Hardly	Slightly	Often	Use a lot
The comment function	Not use at all	Hardly	Slightly	Often	Use a lot



The email a friend function	Not use at all	Hardly	Slightly	Often	Use a lot
The “watch this topic” function to notify me/email when topic is updated	Not use at all	Hardly	Slightly	Often	Use a lot
RSS feed to notify me when content is updated	Not use at all	Hardly	Slightly	Often	Use a lot

**SECTION 3: USAGE**

Approximately how much time per week (in hours and minutes) do you spend on <a href="http://www.thehubsa.co.za">www.thehubsa.co.za</a> ?	PLEASE STATE IN HOURS AND MINUTES			
Please list the products/services that you make use of that are advertised on <a href="http://www.thehubsa.co.za">www.thehubsa.co.za</a> (please mark with an x)	Online bike stores			
	Bikes			
	Bike related products e.g. car bike racks			
	Bicycle clothing and kit			
	Bike races			
	Other			
Please indicate the extent of your			<b>Use</b>	<b>Not use</b>

use of the following brands advertised on <a href="http://www.thehubsa.co.za">www.thehubsa.co.za</a> (please mark with an x)?	Felt Bicycles		
	Helivac		
	RSA Web		
	Chainreactioncycles.com		
	Renosterveld Mountain bike race		
	Other (please specify)		

#### SECTION 4: BEHAVIOUR AND DEMOGRAPHICS

How many years have you been riding a bike (please state in years)?		
Approximately how many races do you participate in each year (please provide total number)?		
Do you ride a road bike, mountain bike or both (please mark with an x)?	Road bike	
	Mountain bike	
	Both	

**Thank-you for your participation!**

## APPENDIX B: NORMALITY DESCRIPTIVES AND EXTREME VALUES FOR DART SCALE

Descriptives			Statistic	Std. Error
Dialogue	Mean		2.8300	.03511
	95% Lower Confidence Bound Interval for Mean	Lower Bound	2.7608	
	5% Trimmed Mean	Upper Bound	2.8993	
	Median		2.8311	
	Variance		2.9167	
	Std. Deviation		.248	
			.49783	
Access	Mean		3.4693	.05232
	95% Lower Confidence Bound Interval for Mean	Lower Bound	3.3661	
	5% Trimmed Mean	Upper Bound	3.5725	
	Median		3.4788	
	Variance		3.3333	
	Std. Deviation		.550	
			.74182	
Risk_benefits	Mean		2.9270	.05205
	95% Lower Confidence Bound Interval for Mean	Lower Bound	2.8244	
	5% Trimmed Mean	Upper Bound	3.0297	
	Median		2.9190	
	Variance		3.0000	
	Std. Deviation		.545	
			.73800	
Transparency	Mean		2.5323	.06210
	95% Lower Confidence Bound Interval for Mean	Lower Bound	2.4099	
	5% Trimmed Mean	Upper Bound	2.6548	
	Median		2.5083	
	Variance		2.5000	
	Std. Deviation		.775	
			.88045	

Extreme Values			Case Number	Value
Dialogue	Highest	1	46	4.00
		2	2	3.92
		3	64	3.92
		4	138	3.83
		5	165	3.83
	Lowest	1	146	1.33
		2	52	1.67
		3	57	1.83
		4	36	1.83
		5	15	1.83
Access	Highest	1	52	5.00
		2	78	5.00
		3	87	5.00
		4	131	5.00
		5	138	5.00
	Lowest	1	146	1.00
		2	108	1.00
		3	20	1.67
		4	159	2.00
		5	92	2.00
Risk_benefits	Highest	1	165	5.00
		2	174	5.00
		3	46	4.67
		4	78	4.67
		5	171	4.67
	Lowest	1	146	1.00
		2	197	1.33
		3	182	1.33
		4	70	1.33
		5	32	1.33
Transparency	Highest	1	77	5.00
		2	98	5.00
		3	165	5.00
		4	183	5.00
		5	170	4.50
	Lowest	1	159	1.00
		2	146	1.00
		3	122	1.00
		4	86	1.00
		5	57	1.00

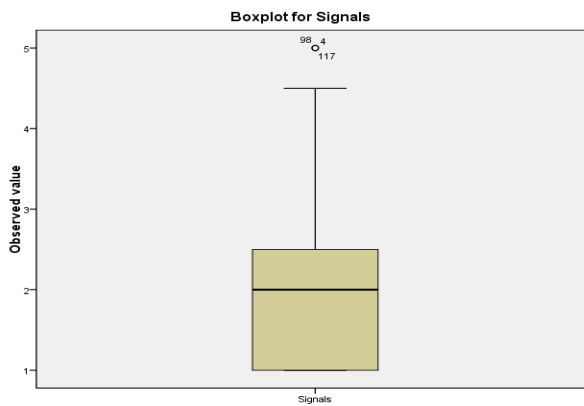
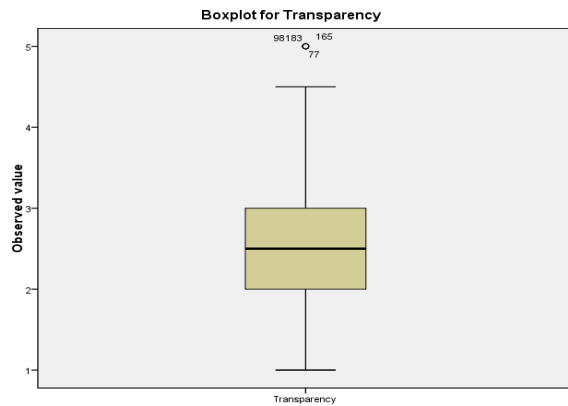
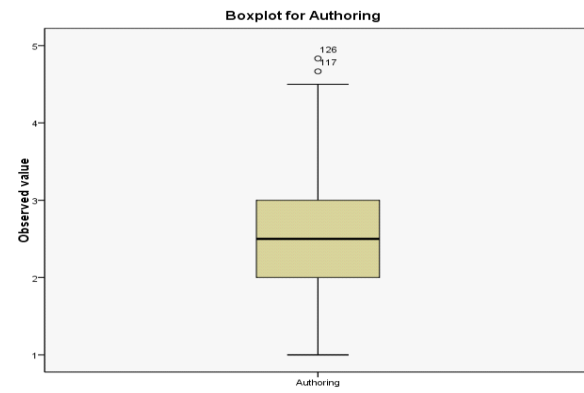
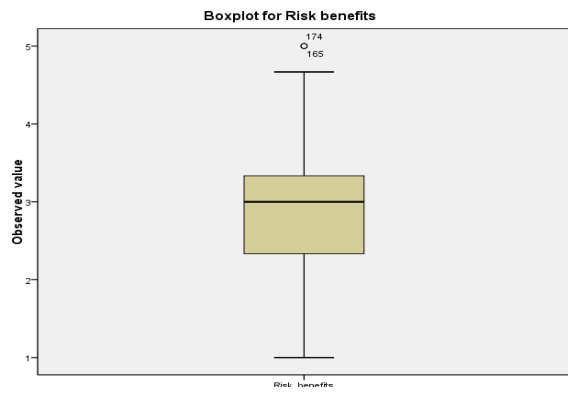
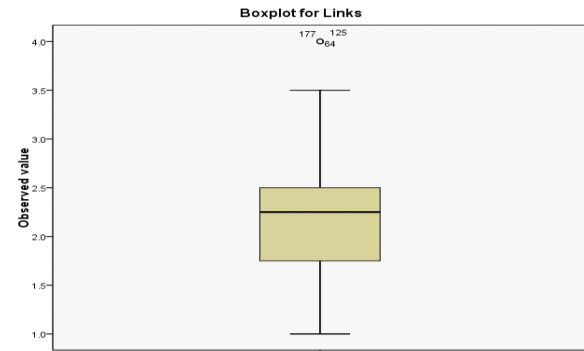
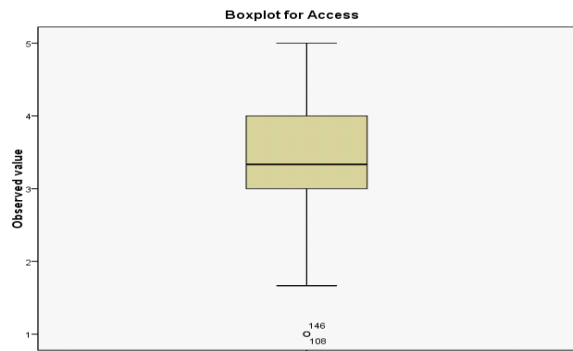
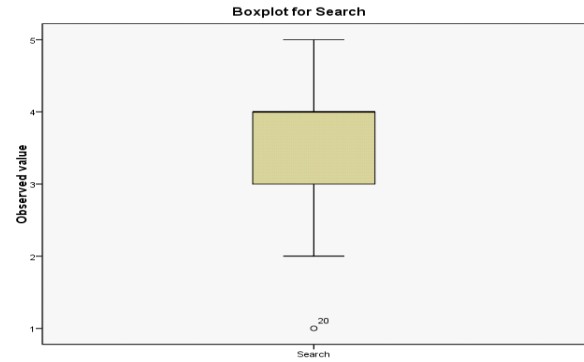
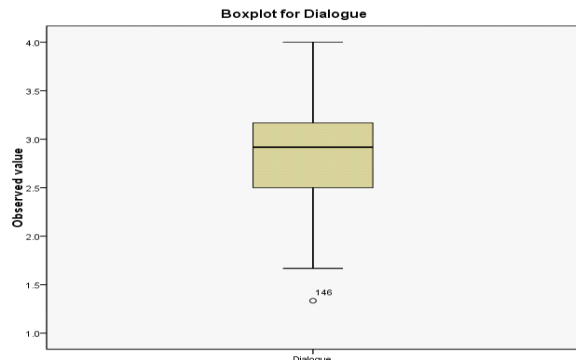
## APPENDIX C: NORMALITY DESCRIPTIVES AND EXTREME VALUES FOR SLATES SCALE

Descriptives			Statistic	Std. Error
Search	Mean		3.7214	.05993
	95% Lower Confidence Bound Interval for Mean	Lower Bound	3.6032	
	5% Trimmed Mean	Upper Bound	3.8396	
	Median		3.7515	
	Variance		4.0000	
	Std. Deviation		.722	
			.84970	
Links	Mean		2.1903	.04026
	95% Lower Confidence Bound Interval for Mean	Lower Bound	2.1109	
	5% Trimmed Mean	Upper Bound	2.2697	
	Median		2.1810	
	Variance		2.2500	
	Std. Deviation		.326	
			.57078	
Authoring	Mean		2.5265	.05347
	95% Lower Confidence Bound Interval for Mean	Lower Bound	2.4211	
	5% Trimmed Mean	Upper Bound	2.6320	
	Median		2.5082	
	Variance		2.5000	
	Std. Deviation		.575	
			.75800	
Signals	Mean		1.9502	.06579
	95% Lower Confidence Bound Interval for Mean	Lower Bound	1.8205	
	5% Trimmed Mean	Upper Bound	2.0800	
	Median		1.8755	
	Variance		2.0000	
	Std. Deviation		.870	
			.93274	

Extreme Values			Case Number	Value
Search	Highest	1	1	5.00
		2	7	5.00
		3	23	5.00
		4	33	5.00
		5	36	5.00
	Lowest	1	20	1.00
		2	181	2.00
		3	180	2.00
		4	167	2.00
		5	160	2.00
Links	Highest	1	64	4.00
		2	125	4.00
		3	177	4.00
		4	60	3.50
		5	166	3.50
	Lowest	1	199	1.00
		2	192	1.00
		3	135	1.00
		4	123	1.00
		5	110	1.00
Authoring	Highest	1	126	4.83
		2	117	4.67
		3	87	4.50
		4	73	4.33
		5	77	4.17
	Lowest	1	146	1.00
		2	131	1.00
		3	122	1.00
		4	23	1.00
		5	123	1.17
Signals	Highest	1	4	5.00
		2	98	5.00
		3	117	5.00
		4	158	4.50
		5	173	4.50
	Lowest	1	199	1.00
		2	198	1.00
		3	195	1.00
		4	194	1.00
		5	192	1.00



## APPENDIX D: BOXPLOTS FOR DART AND SLATES SCALE



## APPENDIX E: RESULTS OF TRANSFORMATIONS TO ACHIEVE NORMALITY FOR DART AND SLATES SCALES

Raw scale variable	Skewness	Kurtosis	K-S Sig.	SQRT scale variable	Skewness	Kurtosis	K-S Sig.	LG10 scale variable	Skewness	Kurtosis	K-S	Inverse scale variable	Skewness	Kurtosis	K-S Sig.
Dialogue	-0.188	-0.144	0.002	Dialogue	-0.446	0.116	0.000	Dialogue	-0.726	0.675	0.000	Dialogue	1.417	3.397	0.000
Access	-0.329	0.556	0.000	Access	-0.845	1.903	0.000	Access	-1.561	5.167	0.000	Access	3.941	23.999	0.000
Risk benefits	0.149	0.087	0.000	Risk benefits	-0.268	0.257	0.000	Risk benefits	-0.741	1.091	0.000	Risk benefits	1.959	6.165	0.000
Transparency	0.422	-0.045	0.000	Transparency	-0.020	-0.340	0.000	Transparency	-0.477	-0.082	0.000	Transparency	1.436	2.011	0.000
Search	-0.469	-0.040	0.000	Search	-0.840	0.774	0.000	Search	-1.316	2.613	0.000	Search	3.038	16.309	0.000
Links	0.372	0.656	0.000	Links	-0.106	0.420	0.000	Links	-0.595	0.792	0.000	Links	1.601	3.238	0.000
Authoring	0.278	0.099	0.020	Authoring	-0.163	-0.093	0.002	Authoring	-0.604	0.212	0.000	Authoring	1.496	2.330	0.000
Signals	0.865	0.434	0.000	Signals	0.454	-0.689	0.000	Signals	0.145	-1.231	0.000	Signals	0.257	-1.539	0.000