

# Social Networks, Interactivity and Satisfaction: Assessing Socio-Technical Behavioral Factors as an Extension to Technology Acceptance

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## Abstract

As the use and value of social networks continues to expand and creatively grow, the question of how to attract people to the various sites becomes an important question. This research focuses on interactivity and its role in user satisfaction with a social network site. A model is put forth that focuses on factors that help answer these questions. A survey was conducted with 164 users of social networking websites (i.e. Facebook, LinkedIn & Twitter) regarding technology acceptance, marketing related factors and user satisfaction. We find that perceived interactivity (in terms of control) and level of focus/concentration do affect an end user's satisfaction with a social network along with antecedents from the technology acceptance model (TAM). These findings suggest both TAM related factors and marketing related factors both impact the user experience on a social networking site.

**Keywords:** Interactivity, Social networks, Technology acceptance model, TAM, Satisfaction, Perceived interactivity, Social capital, Socio-technical theory, Communication, Online shopping, Ecommerce, Social shopping

## 1 Introduction

Social Networking's pervasive growth continues to spread in popularity and importance in all segments of the population, across industries and countries. The importance and growing attention to social networks (SNs) can be seen in marketing, health, education, economics, and throughout a variety of other industries. The value to organizations can be seen in many ways. Social networks allow for an increased ability to communicate, collaborate and share information without consideration of time, space or distance. This information sharing can be seen in ever increasing numbers in online virtual communities such as social networks.

Information sharing is valuable in so many ways to individuals as well as organizations and institutions [24]. Organizations report huge savings across the firm in areas such as marketing, advertising, sales, customer service and recruitment. Health organizations report more efficient and effective information sharing through online interactions [23]. They are able to respond and quickly communicate and share information with others such as patients, doctors, suppliers, and other organizations around the clock [23].

Social shopping is another growing example where information sharing between friends continues to creatively expand the use and value of social networks. Facebook and other social networks are combining with ecommerce to offer social network/ecommerce options. Shopping is a social experience for many and the social fashion shopping sites are proving to be very popular [44]. Social shopping sites such as Feyt, Lyst, Pose, Snapette, Motil and Pinterest allow online users/shoppers to shop around the globe with old and new friends who give them shopping tips or offer their opinions on a range of topics including outfits, store reputations and locations. It creates a very social, interactive online shopping environment.

As global communication continues to expand it becomes important competitively to understand how to create a satisfying interactive environment that encourages users to not only visit but continuously return. We are in an era where firms are looking at new ways to build and establish various relationships with users who may be friends, buyers, sellers or customers. Understanding which factors relate to user satisfaction within online social networks can help in developing interactive social networks that are satisfying and encourage continued use.

In reviewing previous research on social networks there is limited research that examines interactivity and socio-technical relationships [9]. This limited research can be seen in the online shopping environment as well. Past online shopping studies tended to focus less on social relationships and social interactivity and more on specific areas such as customer characteristics and behavior toward the web-stores. For example, several researchers such as ([38], [48]) investigated perceived risk in online shopping. Trust in online shopping was another popular area that was heavily explored [29]. Online shopping experience was also a heavily researched area [43], [46]. Many online shopping studies focus on theories such as Theory of Reasoned Action (TRA) for predicting behavioral intention or Shopping Continuum theory (SCT) [9] evaluating consumer tasks.

In the past ecommerce was not associated with social networks and was not considered a social experience. In the past, ecommerce has "offered limited personal interaction and minimal support to develop and maintain trusting relationships [17]. Although SCT does look at interactivity, it focuses more on shopping tasks and interactivity with the store options and not with the social relationship.

As activities such as social shopping and integrative environments such as social network/ecommerce environments become more popular there will be a need to understand interactivity in social environments.

This research seeks to fill this gap by providing research that examines social networks in regard to perceived interactivity, social and technical factors and the impact on user satisfaction. Additionally, the research model is based on several theories (Interactivity theory, Socio-technical theory, Social-cognitive theory and Technology Acceptance Model theory). The purpose of this study is two-fold. The first purpose is to explore impacts upon satisfaction theoretically and empirically through the effects of perceived interactivity and concentration/focus that support information sharing. The second is to examine the effects TAM-related factors such as perceived ease of use (PEOU), perceived usefulness (PU) and attitude have on satisfaction in the use of social networking sites.

In sum, we present factors that can be used as an extension of the current TAM model. This extension consists of additional factors which include website interactivity and control (per the user) that may be considered when using online media such as social networks.

The rest of the paper is structured in the following manner. Section 2 presents theoretical underpinnings which support our model. This is followed by section 3 that depicts the research model and explains the hypotheses. Section 4 presents the methodology that is used for this research study as well as the results. Finally section 5 presents the discussion and conclusion.

## 2 Theoretical Underpinnings

Three primary theoretical perspectives, socio technical theory, perceived interactivity theory and technology acceptance (i.e. TAM) will support our research model. The following will give an overview on socio technical theory and perceived interactivity theory as they relate to TAM.

### 2.1 Socio-Technical Theory

Socio-Technical theory relates to technological systems and the importance of the consideration of fit between the technological and social dimensions [10], [15]. We suggest that this fit can be extended to include social networks by exploring the integration of technical-behavioral aspects of the TAM model with additional socio-technical, interactive factors in relation to satisfaction. The TAM model has been widely used to explore the technical dimensions by examining users' attitudes and beliefs in relation to intentions to adopt or use technology. We extend the TAM model by including additional factors that relate to the interactive and social aspect of social networks and the effects on satisfaction.

Social networks are socio-technical systems involving interaction within a virtual environment. It is a social environment where users establish relationships to communicate and exchange information and knowledge in online, virtual social communities.

Therefore the consideration of the interactive nature of social networks is important in understanding social networks in terms of technical, social and behavioral aspects. We suggest that user satisfaction in the social network environment has an integrative nature where satisfaction is determined not only by perceptions of usefulness and ease of use but also the social and interactive aspects of the social environment. This interactive aspect can have different levels such as interactive personal involvement, interactive concentration/focus, interactive message and interactive control.

Although the consideration of the technological aspects of social networks can be important considerations, we argue that a more complete and richer understanding can be gained by considering both the technical and social dimensions of social networks.

#### 2.1.1 Additional Support for Socio-Technical Theory

Within this socio-technical environment, social cognitive theory and social capital theory help in explaining our integrative social networking model (behavioral-socio-technical-interactive model). Social capital theory and social cognitive theory are used to help in understanding the social and interactive nature of social Networks. Nahapiet and Ghosal [50] argue that a user's relationships can strongly influence willingness to share information in interactive environments like social networks. We suggest that user's satisfaction with the social network is influenced by their experience in terms of social network structure, social and personal relationships.

Interaction or the ability to interact in a social network environment is one of the most distinguishing qualities of Web 2.0 tools such as social networks. Social networks involve social interactions and relationships with different levels of privacy and trust, where people are sharing information, knowledge and resources. This interaction encompasses both personal and social dimensions. Social capital theory helps in understanding the social aspect of social networks in regard to the three interactive dimensions discussed in the social capital theory literature. The three dimensions are: 1) structure of the social network 2) relationships in the social network and 3) knowledge or information obtained from the social network [50].

Social Cognitive theory is used to help in understanding the personal interactive nature of social Networks. The theory focuses on personal dimensions and the social network which emphasize self-efficacy and outcome expectations [5]. Self-efficacy focuses on a person's perceptions of their own ability to impact their performance. In our model we relate personal involvement and concentration as factors that relate to personal cognition and self-efficacy.

These relationships may or may not be enjoyable and satisfying for users depending on their experience. The integrative nature of the perceptions of usefulness and ease of use along with the interactive aspects of the social network in terms of information and technical characteristics (from personal and social perspective) can affect the level of satisfaction [71].

Social capital emphasizes the importance of social relationships and activities and the valuable resources or by-products of the relationships [4], [8], [16], [50]. Interactions within a social structure tend to strengthen social relationships, social capital and use [50]. Internet use such as social network use was found to add value to relationships by strengthening political, community and personal relationships of the users in terms of trust and reciprocity [26], [55].

Drawing from (Nahapiet and Ghosal) [50] we concentrate on the relationship and information-sharing dimension which highlights the behavioral aspect which might include the following: trust and trustworthiness, norms, identity and expectations. We argue that the increased social capital from positive interaction in terms of personal involvement, concentration; /focus, perceived interactivity may increase satisfaction with using social network sites. We argue that part of the attraction to the social networks relates to the social capital or resources gained from the relationships such as new career or employment connections, new friends or useful information that a user may obtain from the site [32], [53]. Previous studies support a positive association between Internet use and social capital [26], [55].

## 2.2 Information Sharing, Interaction and Social Capital in Social Networks

Knowledge or information sharing is one type of social capital gained from interactive relationships within social networks. Information sharing is a key component of virtual communities such as social networks. Without users' presence, interaction and information sharing, social networks provide limited value [12]. Content or information supplied by the user is critical to the success of the social network [12]. Unlike other traditional modes of communication, online social networks provide an opportunity to interact, establish relationships and continuously engage with others through information sharing. Information sharing is an important aspect of social networks. In order to obtain this information there must be interaction. The user's perceived interaction regarding the social network site relates to the message as well as the users' feelings of control when using the SN site. The users' perceptions of the interaction may play a role in user satisfaction and whether people initially visit or continue to visit a site. Therefore, we suggest that it is important to understand perceived interaction. We argue that perceived interaction may be an important factor to consider regarding social networks.

## 2.3 Interactivity-Perceived Interaction

A key part of social networking involves interaction among different individuals in an online social setting. Social networking sites allow interactive communication in a one-to-one or one-to-many online scenario using different website features. Usage may affect perceptions associated with the interaction with website features relating to communication and quality of the message. According to telepresence theory [62] and interactivity theory [56] the message and the mediated environment are associated with perceptions of interactivity. Telepresence theory suggests that an individual's relationship to a communication medium and its characteristics influences perceived interactivity [62]. Interactivity theory posits that the quality of the communication has a positive effect on perceived interactivity [56]. Interactivity can play an essential role in web-based, network-oriented environments [61], Findings in the literature focus on two dimensions of perceived interactivity: [1] the individual's sense of efficacy; and [3] the individual's sense of the media system's interactivity [51], including an emphasis on the "direction of communication [33], [56].

## 2.4 Interactivity- Web 2.0 and Social Networks

A key aspect of Web 2.0 tools is the interaction/interactivity that takes place within and between social networking environments. There has been mixed support for interactivity. Some research studies demonstrated positive support between interactivity and attitudes toward websites [37], [42], [49], [71], whereas other research studies refute this relationship [6], [18]. Interactivity has been studied and measured in different ways. It has been measured as an object [6], [18], [36] as well as from a perception point of view [13], [37], [42]. There are different types of interaction. The interaction may involve: interaction with the message; interaction control; personal interaction or intensity of control relating to focus and concentration. In the next two sections we continue with a discussion of a) interactivity and personal involvement and b) interactivity and concentration/focus. This is followed by a discussion of satisfaction and the TAM model.

## 2.5 Interactivity- Personal Involvement

This type of interactivity relates to user's personal connection and interaction in terms of the relationship and information exchange. In a virtual community such as a social network, information sharing takes on a level of personal involvement. Users are attracted to sites where their interaction, involves a level of personal identification [25]. In an online environment personal identification/connection with the site and the information may have an impact on their level of satisfaction. According to Eighmey and McCord [25] p. 187, "New dimensions called personal involvement and continuing relationship were identified and found to be important factors when examining audience reactions to websites". Chung and Zhao [14] p. 4, state, "When consumers are highly involved with the stimulus (high personal relevance or high product involvement), they have a strong motivation to process that stimulus." Previous research supports the significance of users' identification with the personal wants, needs and interests of users expressed in a technological environment. Personal involvement may relate to a user's interests in areas such as: career, hobbies, education, entertainment, technological expertise). Examples of characteristics of personal involvement might include: convenience, diversion, relationship development, and intellectual appeal. One study on gratification and use of computer-aided technology (CAI) focused on understanding personal involvement and interactivity regarding the intellectual interest, involvement, and the convenience of the technology [40]. The study

indicated a positive relationship with personal involvement and the use of computer-aided technology. Another study that further supports the idea of personal involvement and use demonstrates the importance of content as a measure of personal involvement [64]. Therefore in this research, personal involvement is examined as a potential factor to consider in understanding social networks.

## 2.6 Interactivity--Concentration/Focus

This type of interaction relates to intense concentration. Intense concentration or flow was found to significantly relate to use behavior. We suggest that when there is intense flow or concentration, that users may be more satisfied which may lead to increased use. Optimal flow theory relates to individual experiences when using computers [30]. Flow relates to “an individuals’ sense of control and level of challenge perceived in using computers” [30] p. 381). The theory of optimal flow has been used in previous research studies to help in understanding how users approach technology and why some users will stay for long periods of time and others will jump on and off in a matter of seconds . Flow can be measured in terms of a sense of control and challenge level. Csikszentmihalyi [19] p. 4 was first to develop and apply the theory of optimal flow which is defined as “the state in which people are so intensely involved in an activity that nothing else seems to matter; the experience itself is so enjoyable that people will do it even at great cost, for the sheer enjoyment of doing it.”

There are two main characteristics of flow: 1) total concentration in an activity and 2) the enjoyment that comes from engaging in an activity. Several research studies discuss the intense enjoyment and absorption that a user experiences when using computers [30], [70]. Furthermore, Challenge was found to have a significant relationship with flow [30].

Webster [70] found that immediate feedback was a major contributor to user enjoyment. Ghani [30] observed that there was a significant relationship between flow and exploratory use behavior.

## 2.7 TAM Model and Social Networks

Theory of Reasoned Action (TRA) — TRA offers support in explaining the social-psychological factors that may influence the use of a social networking website in terms of behavioral intentions and actual behavior. TRA inherently focuses on social psychology principles and research [29] which aid in understanding and predicting individual behavior. Ajzen [27] asserts that individual beliefs affect actual behavior or behavioral perceptions [27]. Moreover, TRA suggests that actual behavior relates to an individual’s behavioral intentions (BIs). Behavioral intentions are influenced by: (a) individual attitude regarding the behavior; and (b) social norms, which are defined as individual perceptions of social demands or pressures. TRA has provided support in other research studies to help understand and predict shopping behavior, [72] consumer complaints and purchasing behavior [52], [60] and information systems [22], [34], [67], [69].

*Technology Acceptance Model (TAM)* — The technology acceptance model (TAM), built partially on the theory of reasoned action, offers support in explaining the technological factors that may affect satisfaction and intentions to use social networking websites. TAM was developed [22] to help explain why people accept or reject computer technology. TAM is grounded in the assertion that the individual impact of perceived usefulness and ease of use of technology will influence the attitude of an individual when using a particular technology, and will also have an impact on their behavioral intent to use computer technology.

TAM models have been widely used in a variety of studies using a range of variables. Perceived ease of use (PEOU) and perceived usefulness (PU) are part of the core TAM model and have consistently been found to be strong predictors of acceptance behavior. For example, Venkatesh [68] created a model, Unified Theory of Technology Acceptance and Use of technology (UTAUT) that included the PEOU and PU constructs because of consistently observing their strong predictive qualities in eight other TAM models. Additionally, PEOU and PU were strong predictors of acceptance behavior in the other research such as: research by [45] involving the spreadsheets and the TAM model; research by [65] involving email and voice mail research [63]. PU and PEOU were selected for this study because of their record of strong reliability and validity and record of empirical results showing PU and PEOU as strong predictors of technology acceptance behavior [21], [68].

## 2.8 Satisfaction and Social Networks

As the number and types of social networking sites continue to grow and compete for users’ attention, the question of how to make users’ experiences satisfying becomes a critical question. Bolton and Lemon [7] indicate that there is a positive relationship between usage and satisfaction. Wixom and Todd [71] found that user satisfaction and intention to use technology is significantly affected when concurrently considering both the perceptions of the quality of the shared information as well as the quality of the technology. Social networking sites want members to use their sites. They want users to keep returning, communicating and sharing information.

In order for this to happen, users must be satisfied with their experience. Part of that experience involves not just the technology, but the interactivity or perceived interactivity associated with the site in terms of the message, personal

relationships, social exchange and control. Szymanska [66] indicates that when users' perceptions of web sites are positive, that they are more satisfied with their web site experience. When users feel that they have more control in interacting through the website, they are more satisfied and tend to return more often to the site [25], [66]. For example when users feel that they have control over their network privacy, they may feel more of a sense of control and therefore feel more satisfied with the experience.

Satisfaction has been used in a number of research studies to examine a user's positive attitude toward website experiences [12], [20], [66], [71]. Szymanska and Hise [66] performed a study on e-retailers and consumer satisfaction. He found that, "convenience, site design, and financial security are the dominant factors in consumer assessments of e-satisfaction." [66], p. 309.

In this study satisfaction is used as a measure of intention to use social networks. We argue that our model which consists of a combination of TAM-related factors along with other interactive-and social factors has a positive influence on satisfaction and provide strong predictive indicators of future intention to use social networks. Satisfaction is defined as a pleasing experience with the social networking experience in terms of technology and social interaction.

Several researchers have argued that components of TAM and satisfaction factors should be integrated to provide richer, predictive value of user satisfaction of behavioral intentions [31], [35], [59], [71]. Wixon and Todd [71] conducted research using an integrated model with TAM and satisfaction and found strong predictive support for usage.

### 3 Research Model

The research model depicted in figure 1 below will attempt to explain variance in website satisfaction in a social networking context. The model is specifically put forth to answer the following research question: *How does TAM related factors and marketing (e-commerce) factors impact satisfaction with technology?*

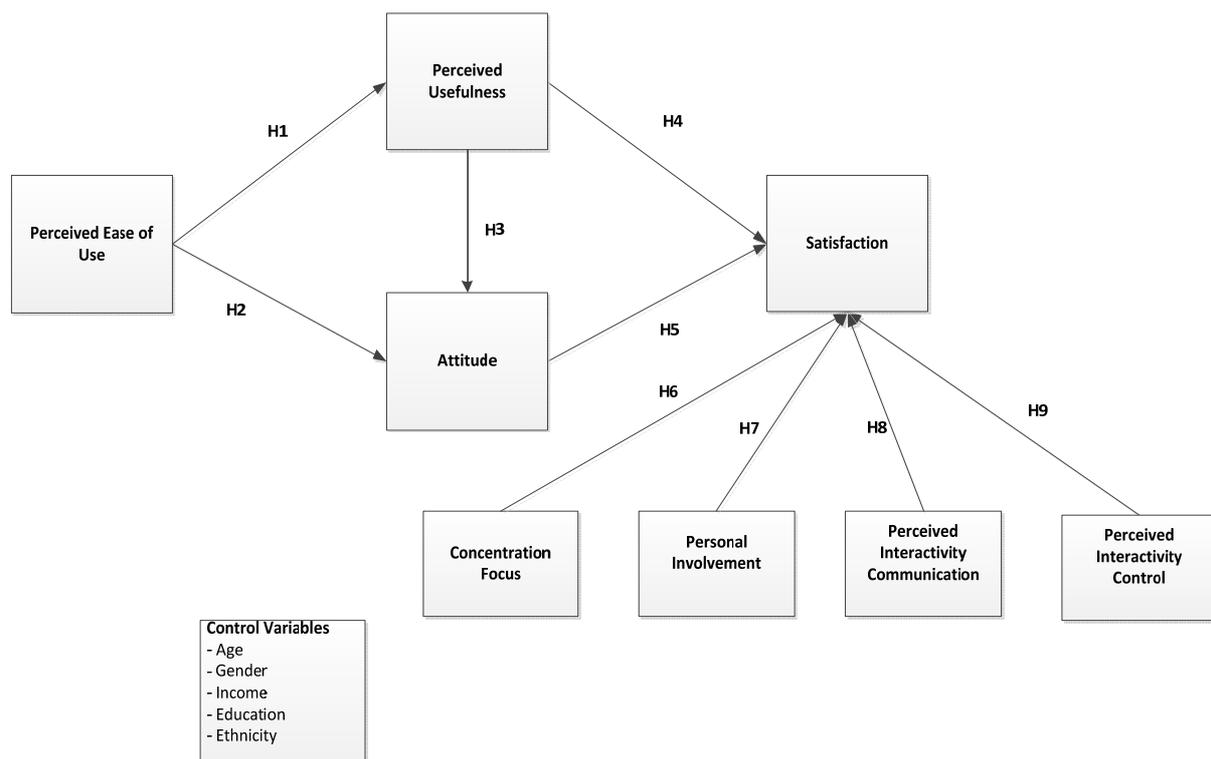


Figure 1: Research model

The following will present the Hypotheses related to the research model.

#### 3.1 Perceived Ease of Use and Perceived Usefulness

Consistent with the technology acceptance literature, the perceived ease of use of a technology should lead to greater usefulness of a technology. Perceived ease of use is specifically conceptualized by [21] to describe a system that is "free of effort". The application user can navigate the system easily, for their own purpose, while perceived usefulness is associated specifically with an individual improving their own job performance. Specific to social

networking websites, although they are used, for the most part in a non-work environment, they are voluntary in nature. Nevertheless acceptance of a social networking website tool is very much dependent on ease of use and usefulness. Individual acceptance is a necessary condition to expand the use of the tool within particular social networks for providers to monetize individual use. Thus within a social networking website, the easier an individual finds a particular technology, the more positive the individual should feel toward that technology. Therefore the following hypothesis is put forth:

*H1: Increases in perceptions of ease of use in a social networking website should lead to increased perceptions of usefulness in a social networking website.*

### **3.2 Perceived ease of use and attitude**

Consistent with the technology acceptance literature, the perceived ease of use of a technology should lead to a more positive attitude toward that technology [21], [22]. Within a social networking context, the easier an individual finds a particular technology, the more positive the individual should feel toward that technology. Positive attitudes may be engendered through navigation of the social networking website, interaction with other members of their network or application extensions of the web 2.0 tool. The primary concern of the individual is their interaction with others. The easier for an individual user to engage with others, the more positive the user should feel regarding the tool that they are using. Perceptions of use of the tool must be easy to encourage continued use and by the same token a positive attitude. Therefore the following hypothesis is put forth:

*H2: Increases in perceptions of ease of use in a social networking website should lead to increasingly positive attitudes in a social networking website.*

### **3.3 Perceived Usefulness and Attitude**

Previous researchers have studied attitude and technology from different perspectives such as trust [41] usefulness [57], [72]. According to previous TAM-related research, attitudes or beliefs about usefulness can impact website use [58], [69]. Ajzen [2] argues that individual beliefs impact behavioral perceptions toward usefulness and perceived ease of use. Beliefs about technology in terms of perceptions of usefulness have also been shown to influence attitude [60], [62], [72]. Specific to social networking websites, attitudes and beliefs regarding a user's specific network will most likely impact attitudes and feelings about how useful the system is. The more entrenched an individual user is with their network, the user is more likely to view the web 2.0 tool positively. Therefore, consistent with prior literature, an individual's perceived usefulness of a technology should impact the individual's attitude regarding a social networking site. Thus the following hypothesis is put forth:

*H3: Increases in the perceived usefulness of a social networking website will lead to a increasingly positive attitudes toward a social networking website.*

### **3.4 Perceived Usefulness and Satisfaction**

A user of a web 2.0 social networking tool that finds it to be useful for a specific purpose should therefore be satisfied with their experience using the website. Social networking users that engage in maintaining relationships, gaming or meeting new people in a seamless manner utilizing the web 2.0 tool will find that the usefulness of the software will lead to a satisfying experience. Examples in the literature from tests of other systems find that user satisfaction is indeed related to perceived usefulness Mawhinney and Lederer [47]. Furthermore Calisir & Calisir [8] find that perceived usefulness significantly impacts user satisfaction in an enterprise resource planning context. Thus the following hypothesis is put forth:

*H4: Increases in the perceived usefulness of a social networking website will lead to increases in satisfaction with a social networking website.*

### **3.5 Attitude and Satisfaction**

Attitude can impact how an individual feels about using a social networking site which in turn impacts the users' satisfaction with the website. Previous research provides evidence for the importance of attitudes in the perception of IS use, which can encourage continuous use [21], [22]. When social network users feel their interaction with the site is useful in terms of communication, knowledge sharing, and establishing or renewing contacts, then they will maintain a positive attitude toward the website which will lead to a satisfying experience. Thus the following hypothesis is put forth:

*H5: Increasingly positive attitudes will lead to increases in satisfaction with a social networking website.*

### 3.6 Concentration/Focus and Satisfaction

Within the context of a website, concentration/focus is a construct that has primarily been used in the literature from a marketing perspective, specifically consumer behavior [39]. E-commerce website developers are purposefully attempting to create environments that attempt to fully engage the user for extended periods of time in the hopes that the user does not leave the website until a purchase has been made. Although the end result with social networking tools is not a purchase, the primary purpose is the same (as an e-commerce website) in that the intent is to keep the user on the website for as long as possible. Users that remain focused on the social networking website for longer periods should be satisfied with their visit and should engage in ongoing usage. Thus the following hypothesis is put forth:

*H6: Increases in concentration/focus while using a social networking website will lead to increase in satisfaction with a social networking website.*

### 3.7 Personal Involvement and satisfaction

A user's experience with a social networking website should allow the user some control in which to create a sense of ownership with their use. The degree to which a user can personalize their experience with the tool and others in which they interact is vital to the continued use of the tool. When the user feels a sense of involvement [25], [33] they should continue to use the website and further expand their network of users. The higher level of involvement the user engages in with their part of the social networking tool as well as with others, should positively impact satisfaction with the social networking tool. Thus the following hypothesis is put forth:

*H7: Increases in personal involvement of a social networking website will lead to increasing satisfaction with a social networking website.*

### 3.8 Perceived Interactivity (Communication/Control) and Satisfaction

The conceptualization of the interactivity construct is positioned in the communications literature [56] as well as the marketing literature specific to web purchases [61]. Perceived interactivity (Control) in this study focuses on control over the exchange/communication whereas in [2]. Theory of Planned Behavior, perceived behavioral control focuses more on physical control over the technology. Websites in general are attempting to communicate certain themes to the visitor. Regardless of the purpose of the content of the website, the goal is for the visitor to remain long enough to complete a specific transaction. This transaction may be a monetary exchange or an exchange of information between the website and visitor, between visitors or amongst several visitors. Nonetheless, context aside, the goal of a website is to serve as a conduit of communications for the visitor to engage in. Web 2.0 tools such as social networking sites are uniquely positioned to allow for communication between other users in a one to one exchange or amongst several users simultaneously. For the web visit to be satisfying for the visitor, the visitor must be able to communicate effortlessly in the social networking environment and remain in control of their time on line. In a further test to substantiate the work of Song and Zinkhan [61] who find that perceived interactivity in terms of communication and control impact satisfaction in a website service environment, the following hypotheses are put forth in a social networking context:

*H8: Increases in perceived interactivity (in terms of communication) within a social networking website will lead to increases in satisfaction with a social networking website.*

*H9: Increases in perceived interactivity (in terms of control) within a social networking website will lead to increases in satisfaction with a social networking website.*

Furthermore, although not specifically hypothesized, demographic variables will be tested in the model as control variables. Demographic variables to be collected include user age, gender, income level, level of educational attainment and ethnicity. The demographic variables will be included to determine if user satisfaction is significantly impacted by the presence of individual differences.

## 4 Method

A survey study was conducted with students at a midsized U.S. southeastern university as well as users of Facebook and professionals using LinkedIn. Potential respondents were solicited from 5 different undergraduate management information systems and accounting classes as well as "friends" and LinkedIn colleagues of the authors. The total potential survey population was 577 potential respondents (130 from the students, 240 from Facebook and 197 from LinkedIn). The survey was administered on the Internet using Survey Monkey as a hosting tool. All survey items were measured using 7 point likert scales. Survey items included TAM related variables as well as those relating to marketing/e-commerce factors and demographic items. Potential respondents were also asked

to answer the questions with regard to the social networking site they used the most. Survey items can be found in appendix A.

#### 4.1 Sample Characteristics

A total of 164 respondents provided complete and usable surveys resulting in a 28% overall response rate. The sample contained 103 student responses (i.e. 63% of the survey respondents), 16 responses from Facebook users (i.e. 10% of the survey respondents) and 44 responses from LinkedIn (i.e. 27% of the survey respondents). Sample characteristics are as follows. There were 81 male respondents, (49%) and 83 female respondents, (51%). Ninety-six (58.5%) of the respondents were in the 18 – 24 age category, while 32 (19.5%) of the respondents were in the 25 – 35 category. Twenty-six (16%) respondents were in the 36 – 45 category and 9 (6%) were between 46 – 55. There was one respondent over 55 years of age. Ethnicity of the respondent population is as follows. One hundred and eleven (68%) respondents were African American, 6 (4%) of the respondents were Asian, 42 (26%) of the respondents were Caucasian, and 4 (2%) of the respondents were Indian. With regard to which social networking sites they used the most, the majority of the respondents, approximately 68%, used Facebook while 10% used LinkedIn the most and 22% used Twitter the most.

#### 4.2 Results Measurement Model

Due to the modest nature of the sample size Partial Least Squares (PLS) is used to evaluate the model. PLS assesses reliability and validity by calculating the internal composite reliability (ICR) and the average variance extracted (AVE). The ICR is interpreted in the same manner as Cronbach's Alpha. An ICR of 0.7 is an indicator of sufficient reliability [28]. ICRs reported in Table 1 indicate sufficient reliability for all constructs (lowest = 0.78). The AVE measures variance explained relative to measurement error. A valid construct has an AVE greater than 0.50 [11] which indicates the construct items consistently measure what is intended. Results in table 1 below show that all of the constructs have AVEs greater than 0.50, evidence of convergent validity.

Table 1: Correlation matrix

	Mean	S.D.	ICR	ATT	CF	PEOU	PI	PICM	PICN	PU	SAT
ATT	5.51	1.02	.93	<b>.90</b>							
CF	4.11	1.51	.95	.40	<b>.91</b>						
PEOU	6.21	1.44	.78	.56	.24	<b>.82</b>					
PI	5.11	1.12	.90	.63	.45	.59	<b>.87</b>				
PICM	5.73	0.97	.91	.51	.28	.52	.46	<b>.85</b>			
PICN	5.35	1.08	.93	.59	.41	.65	.52	.63	<b>.82</b>		
PU	5.70	1.06	.87	.61	.31	.56	.61	.56	.55	<b>.83</b>	
SAT	5.34	1.03	.88	.72	.52	.63	.62	.53	.62	.62	<b>.88</b>
AVE				<b>.81</b>	<b>.82</b>	<b>.68</b>	<b>.75</b>	<b>.73</b>	<b>.68</b>	<b>.69</b>	<b>.78</b>

Note: 1. Diagonal elements are the square root of the Average Variance Extracted (AVE). Means & standard deviations are calculated based upon 7 point likert scales (with the exception of the Frequency construct which is calculated based upon a 5 point scale). ATT=Attitude, CF=Concentration/Focus, PEOU=Perceived Ease of Use, PI=Personal Involvement, PICM=Perceived Interactivity(Communication), PICN=Perceived Interactivity(Control), PU=Perceived Usefulness, SAT=Satisfaction

Discriminant validity requires that constructs be distinct from one another. The test for discriminant reliability requires that the square roots of the AVEs for two latent variables must each be greater than the correlations between those two variables [28]. An examination of the correlations among constructs in Table 1 shows that the data pass this requirement, demonstrating adequate discriminant validity. Furthermore table 2 below displays the loadings and cross loadings for each construct.

Table 2: Item loadings/cross loadings\*

	ATT	CF	PEOU	PI	PICM	PICN	PU	SAT
ATT1	<b>0.925</b>	0.336	0.493	0.543	0.465	0.525	0.580	0.638
ATT2	<b>0.922</b>	0.431	0.538	0.609	0.538	0.618	0.608	0.743
ATT3	<b>0.857</b>	0.303	0.480	0.538	0.353	0.423	0.464	0.561
CF1	0.395	<b>0.908</b>	0.240	0.468	0.273	0.405	0.304	0.544
CF2	0.441	<b>0.909</b>	0.326	0.471	0.328	0.438	0.388	0.503
CF3	0.321	<b>0.908</b>	0.121	0.317	0.193	0.304	0.204	0.395
CF4	0.263	<b>0.893</b>	0.131	0.324	0.178	0.308	0.188	0.411
PEOU1	0.559	0.327	<b>0.857</b>	0.625	0.518	0.591	0.541	0.581
PEOU2	0.479	0.129	<b>0.915</b>	0.475	0.465	0.587	0.501	0.548
PEOU3	0.505	0.197	<b>0.905</b>	0.533	0.430	0.573	0.510	0.601
PI1	0.579	0.283	0.570	<b>0.880</b>	0.470	0.547	0.613	0.533
PI2	0.471	0.512	0.431	<b>0.811</b>	0.319	0.360	0.457	0.561
PI3	0.582	0.358	0.549	<b>0.910</b>	0.395	0.450	0.512	0.503
PICM1	0.445	0.201	0.468	0.382	<b>0.897</b>	0.503	0.491	0.414
PICM2	0.479	0.261	0.499	0.442	<b>0.925</b>	0.572	0.534	0.523
PICM3	0.450	0.247	0.398	0.407	<b>0.834</b>	0.561	0.454	0.469
PICM4	0.350	0.227	0.405	0.306	<b>0.748</b>	0.512	0.413	0.391
PICN1	0.453	0.304	0.469	0.387	0.580	<b>0.840</b>	0.437	0.464
PICN2	0.458	0.299	0.606	0.457	0.512	<b>0.862</b>	0.404	0.505
PICN3	0.505	0.379	0.558	0.457	0.510	<b>0.877</b>	0.421	0.532
PICN4	0.481	0.420	0.469	0.490	0.449	<b>0.786</b>	0.489	0.499
PICN5	0.559	0.303	0.606	0.460	0.586	<b>0.840</b>	0.563	0.568
PICN6	0.417	0.314	0.454	0.302	0.463	<b>0.714</b>	0.365	0.480
PU1	0.545	0.212	0.524	0.478	0.515	0.460	<b>0.848</b>	0.587
PU2	0.490	0.323	0.394	0.482	0.415	0.495	<b>0.824</b>	0.502
PU3	0.497	0.246	0.479	0.562	0.451	0.410	<b>0.822</b>	0.446
SAT1	0.740	0.431	0.568	0.589	0.579	0.592	0.651	<b>0.914</b>
SAT2	0.518	0.502	0.541	0.493	0.333	0.499	0.419	<b>0.853</b>

\*see the bottom of table 1 for construct abbreviations

### 4.3 Structural Model

The PLS structural model is interpreted like regression results. The path coefficients represent standard betas while the  $R^2$  amount shown represents the variance explained. Given the research model, figure 2 below depicts the hypothesis testing results.

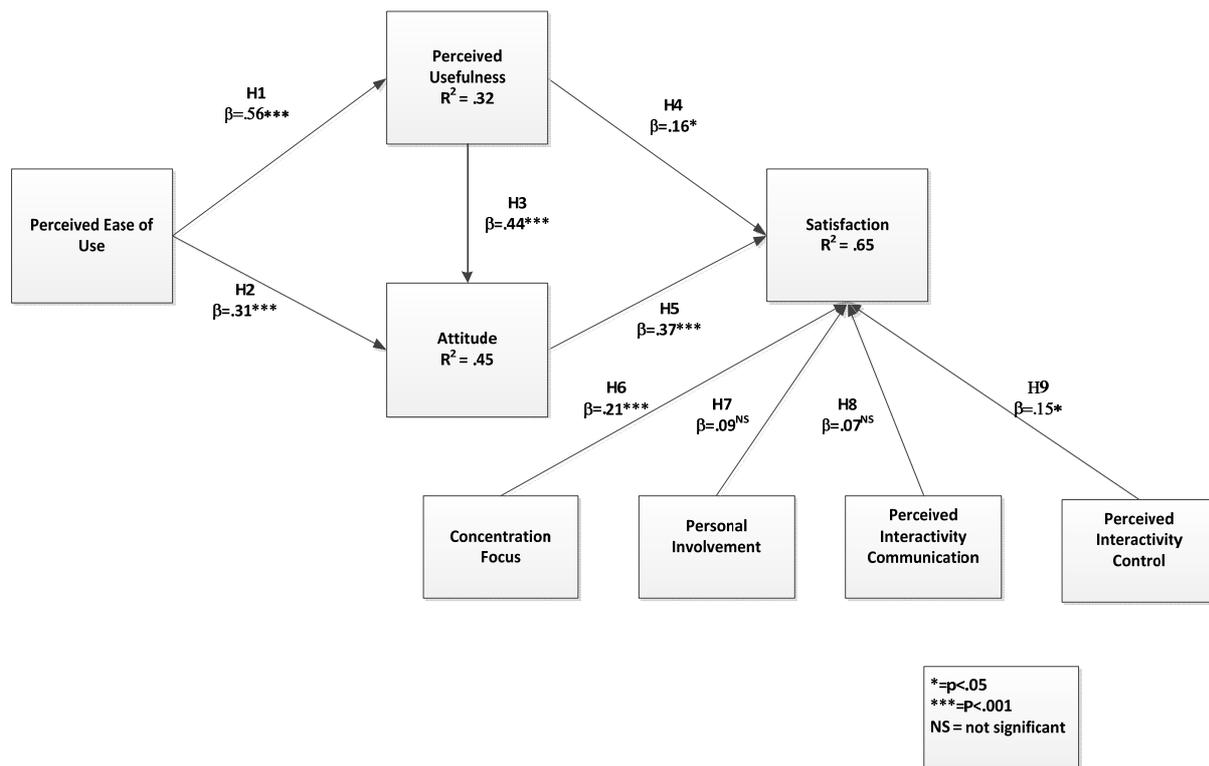


Figure 2: Research model results

In general the model is supported by the data. Overall a large portion of the variance is explained in the dependent variable, satisfaction. The TAM portion of the model impacts satisfaction as hypothesized, while only half the marketing related constructs have significant impacts upon the dependent variable satisfaction. The following will give an overview of the results of each hypothesis.

#### 4.3.1 Hypothesis 1 (Perceived Ease of Use and Perceived Usefulness)

Consistent with the TAM model, perceived ease of use is found to significantly impact perceived usefulness whereas  $\beta = .56$ ,  $p < .001$ ,  $R^2 = .32$ . Consistent with the extant literature this finding suggests that social network users that perceive the networking website is easy to use will prove to be useful. The significant results for this hypothesis suggest that users in a web 2.0 environment are similar to those in other computing environments. The findings also suggest this sample of users have found the social networking website useful to connect with other individuals and entities for the purpose of increasing or maintaining professional or personal ties.

#### 4.3.2 Hypothesis 2 (Perceived Ease of Use and Attitude)

Consistent with the TAM model perceived ease of use is found to significantly impact attitude whereas  $\beta = .31$ ,  $p < .001$ ,  $R^2 = .45$ . This finding suggests that a users' attitude while using a social networking tool is significantly impacted by the use of a social networking tool that is perceived to be easy to use. Another possible implication of this result is that users stay longer because they are engaged in gaming or other users. Thus ease of use is a significant factor to consider for advertisers as well as other content providers on social networking websites.

#### 4.3.3 Hypothesis 3 (Perceived Usefulness and Attitude)

Perceived usefulness consistent with the TAM model significantly impacts attitude whereas  $\beta = .44$ ,  $p < .001$ ,  $R^2 = .45$ . This finding suggests that users are concerned with what the web 2.0 tool can possibly do for them with regard to social networking (both personal and professional), gaming or other activities. Furthermore, as users spend more time on the website engaged with others the value of the network increases.

#### 4.3.4 Hypothesis 4 (Perceived Usefulness and Satisfaction)

Perceived usefulness, as hypothesized significantly impacts satisfaction whereas  $\beta = .16$ ,  $p < .05$ ,  $R^2 = .65$ . This finding suggests that the perceived usefulness of the social networking tool leads to a satisfying user experience during their visit to the website. Usefulness, in this context can be viewed as increasing an individual's social ties or providing another outlet for leisure activities.

#### 4.3.5 Hypothesis 5 (Attitude and Satisfaction)

Attitude, as hypothesized significantly impacts satisfaction whereas  $\beta = .37, p < .001, R^2 = .65$ . This finding suggests that users that maintain a positive attitude toward the social networking tool they are using leads to a satisfying experience with social networking website. Feelings toward other individuals within their network can enhance their experience. Brand affinity can also influence attitude for those users that like a particular company on Facebook, research the company on LinkedIn or follow the company on Twitter.

#### 4.3.6 Hypothesis 6 (Concentration/Focus and Satisfaction)

Concentration/Focus, as hypothesized significantly impacts satisfaction whereas  $\beta = .21, p < .001, R^2 = .65$ . This finding suggests users that are able to engage easily in the functions of a social networking website will be satisfied with their experience. Consistent with the marketing literature, those users that are able to give attention to the specific task they intended to will be more satisfied than users that are not able to focus as intently. The presence of concentration supports an individuals' intention to remain on the website for extended periods of time. When users can concentrate without overextending themselves cognitively, the users as hypothesized are satisfied with their experience on the social networking website.

#### 4.3.7 Hypothesis 7 (Personal Involvement and Satisfaction)

The results of these data in the hypothesized model suggest the personal involvement construct does *not* have a significant impact upon satisfaction. The personal involvement construct is comprised of items that convey individuals derive information from the network of other users. Apparently in this sample, users do not view their social network as a means to obtain information to enhance their lives. Also users might not view social networking activities as memorable experience as the construct suggests. The social network is a merely another type of entertainment that does not necessarily create a deeper sense of meaning for individuals worth remembering.

#### 4.3.8 Hypothesis 8 (Perceived Interactivity (Communication) and Satisfaction)

The results of these data in the hypothesized model suggest the perceived interactivity (communication) construct does *not* have a significant impact upon satisfaction. The finding suggests that individuals have moved beyond the technical worries of establishing and maintaining communication among members of the network. Communication in any internet enabled environment may now be viewed as a given piece of any web 2.0 collaboration tool. Examples include communication specific tools such as Skype or e-mail. Furthermore most website today allow communication between the individual and customer service for instance or chat related functions on comment boards that allow individuals to communicate with a variety of individuals.

#### 4.3.9 Hypothesis 9 (Perceived Interactivity (Control) and Satisfaction)

Perceived interactivity (control), as hypothesized significantly impacts satisfaction whereas  $\beta = .15, p < .05, R^2 = .65$ . This finding suggests that users feel they need to be able to interact with a social networking website by having the ability to easily be in control of the available features. Satisfaction with the social networking website is derived in part by the user being able to adequately control their actions. Furthermore the results suggest the straightforwardness of interaction with the many different areas of the social networking website, such as chat, messaging, gaming etc. provide the user with a satisfying experience. The more areas the user can control effortlessly, the more the user will remain on the website.

#### 4.3.10 Control Variables

Although controls for income, gender, age, education and ethnicity were collected none were found to be significant. See table 3 below for a summary of the hypothesis testing results.

Table 3: Hypothesis testing results

Hypothesis	Path	Support
H1	PEOU → PU	YES
H2	PEOU → Attitude	YES
H3	PU → Attitude	YES
H4	PU → Satisfaction	YES
H5	Attitude → Satisfaction	YES
H6	Concentration/Focus → Satisfaction	YES
H7	Personal Involvement → Satisfaction	NO
H8	Perceived Interactivity (Communication) → Satisfaction	NO
H9	Perceived Interactivity (Control) → Satisfaction	YES

Overall, the findings suggest that social networking website satisfaction can be thought of in similar terms to other types of information systems. The reason being that technology acceptance heavily impacts satisfaction. In addition to incorporating technology acceptance, this model builds on the literature in that marketing concepts are introduced to further impact satisfaction. Concentration/Focus and perceived interactivity (control) specifically speak to the notion that users must be able to find a website engaging enough to spend a considerable amount of time on. Social networking sites can thus be similarly viewed in the same vein as e-commerce websites that have the end goal to make a purchase. Users must feel in control of their particular transaction as well as be able to clearly focus on the task at hand. Even though a purchase does not take place on a social networking website focus and control are necessary for lengthy visits. Lengthy visits on social networking sites can be then monetized by the website provider.

## 5 Discussion

As social networks continue to grow, the question of how to attract and keep users becomes central to not only attracting but to holding on to users so that they will want to continuously return to the site. The results from our research suggest that technology and marketing factors are important considerations. The results indicate that user's acceptance of the social networking website and the user's level of interaction and focus on the website contribute to website satisfaction. This suggests that satisfaction may go up as users feel more in control of the site, the user can interact with the website easily as well as be able to concentrate on the specific tasks they would like to engage in. This research helps by providing insight into factors which may impact satisfaction with social networking websites. It can be useful for people who seek to understand the similarities between social networking websites and e-commerce websites. This study provides support for recognizing the importance of technology acceptance with social networking websites and the level of interaction necessary for website satisfaction.

### 5.1 Limitations

The study is cross sectional in nature. All the constructs were collected in one survey instrument introducing the possibility of common methods variance. Since the study implies that flow is measured perceptually, Harmon's one factor test [54] was completed and the results indicate that common methods bias is not a problem. Although there is not a methods bias in this sample one cannot conclude that flow is indeed unequivocally present since flow has been measured previously in an objective manner by monitoring changes in physiology. Furthermore the majority of the sample was college student users limiting the generalizability of the results. Nevertheless the results of the study give researchers and practitioner's alike insight into why users spend time on certain websites.

### 5.2 Managerial Implications

As the user population of web 2.0 tools continues to grow, those organizations that provide web 2.0 platforms will have to find new and innovative ways to attract users and keep them engaged with their "friends" or "colleagues". Building upon this engagement will be an attempt to find ways to extract revenue from the interactions with contacts that users have with their "friends" and "colleagues". Web 2.0 platforms such as Facebook, MySpace and Google+ should be aware that the simplicity of the user experience that allows for user control and concentration is what most people are looking for. They want social networks that provide the user with an easy, seamless connection to others as well as a user experience that is free from technical complications. As our research suggests, technology acceptance and control are key to social networking satisfaction.

### 5.3 Research Implications

This study has demonstrated that technology satisfaction has gone beyond the dimensions of TAM to encompass marketing constructs that primarily measure e-commerce intentions to purchase. Throughout the IS literature there has been so much emphasis on how information systems architects get individuals to use technology there has been little use for or an appreciation of merely interacting with the technology. Researchers would be well served to examine other marketing conceptualizations of e-commerce since they are similar to their impact upon website satisfaction. Those antecedents to satisfaction should also be tested in conjunction with TAM to gain an understanding if those antecedents also impact satisfaction significantly as opposed to TAM not significantly impacting satisfaction.

### 5.4 Future Directions for Research

Future studies might focus on examining specific types of social capital for specific areas such as marketing or political organizations. Another interesting area of future study maybe to further examine TAM variables and social capital variables in relation to initial visit versus repeated visits in more detail.

## 5.5 Conclusion

In conclusion this research has attempted to put forth a model that extends the TAM literature in a social networking context. We have demonstrated that factors related to marketing/e-commerce are also driving factors behind satisfaction with technology. Users surveyed in this research appear to be more in favor of technology that fades into the background or is minimally noticeable in that the users feel the need to be in control. As social networking matures, technological sophistication and advancement will be of ultimate importance; however it must remain less and less of a concern to the user.

As the number and types of social networking sites continue to grow and compete for users' attention, the question of how to make users' experiences satisfying becomes a critical question. This research explores this question and can be valuable for researchers and practitioners as they investigate the various uses of social networks for purposes such as ecommerce, healthcare, education, research, and entertainment. For researchers, this study provides a new model that is an extension to the TAM model that examines both technological and social factors associated with interactivity that affect social networks in particular but also can be applied to research on virtual communities in general. For practitioners, firms and organizations, this research provides insight into factors that may be important considerations when developing or integrating social networks into their organizations. As ecommerce moves more toward using social networks to help market and sell their products and services with initiatives such as "social shopping, this research can help in understanding what factors are associated with user satisfaction in social networking environments. Future research can build upon this research by using this model to examine other areas in more detail such as online social shopping, mobile social shopping, and exploring the existing social networks such as Facebook and their use of ecommerce components.

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## Appendix A: Social Network Survey

### Personal Involvement (Eighmey & McCord 1998) (PI)

1. I like using the social networking site because it is personal (I liked the website because it was personal)
2. The exchanges I have on the social networking site are worth remembering (Worth remembering)
3. The social networking site provides new information to me (new information to me)
4. The social networking site is informative (Informative)

### Perceived Usefulness Venkatesh & Davis 1996 I find the social networking site useful

1. In terms of communication
2. In terms of knowledge sharing
3. In terms of establishing
4. In terms of renewing contacts

### Perceived Ease Of Use (Venkatesh & Davis 1996)

1. My interaction with the social networking site is clear and understandable
2. Interacting with the social networking site would not require a lot of my mental effort
3. I find the social networking site is easy to use

### Attitude (Barki & Hartwick 1994) To what degree is the website

1. Useful/Useless
2. Good/Bad
3. Worthless/Valuable
4. Favorable/Unfavorable

### Concentration/ Attention Focus (Ghani et al 1991/Koufaris 2002) (CF) During my last visit to the social networking site ...

1. I was absorbed intensely in the activity
2. My attention was focused on the activity
3. I concentrated fully on the activity
4. I was deeply engrossed in the activity

### Satisfaction (Song & Zinkhan 2008) (S)

1. I am satisfied with the experience (on the social networking website)
2. The experience on the social networking website is exactly what I needed
3. This online experience hasn't worked out as well as I thought it would

**Perceived Interactivity** (Song & Zinkhan 2008) (**PICM**)

*Communication*

1. This web site facilitates two-way communication
2. This web site gives me the opportunity to talk back
3. This web site facilitates concurrent communication
4. This web site enables communication

*Control (PICN)*

1. While I was on the site, I was always aware where I was
2. While I was on the site, I always knew where I was going
3. While I was on the site, I was always able to go where I thought I was going
4. I was delighted to be able to choose which link and when to click
5. I feel that I have a great deal of control over my visiting experience at this site
6. While I was on the site, I could choose freely what I wanted to see