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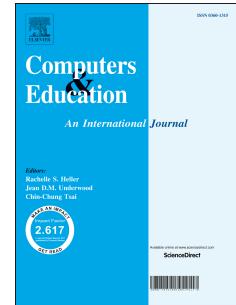
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## Second Life adoption in education: A motivational model based on Uses and Gratifications theory

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### Abstract

Social Virtual Worlds (SVWs) are increasingly being used in education; however, little is known about how personal motivation affects engagement in online learning courses (e-learning). This article focuses on Second Life which is one of the better known SVW platforms and allows relationships to develop amongst people who share similar interests and/or activities. The aims of this study are twofold: (1) to analyse the motivation of Second Life users with regard to e-learning; and (2) to propose a model that explains and predicts the adoption of Second Life in this context. This model has been defined under the postulates of the Uses and Gratification theory (Blumler & Katz, 1974; Swanson, 1987) which comprises the seven constructs of convenience, entertainment, socialising, status seeking, information seeking, sharing experience, and continuance intention. A web-based survey is reported. Findings confirm the positive influence of convenience, sharing experiences, and entertainment on the intention to continue to use Second Life e-learning, and the positive impact of status, and information seeking on sharing experiences. Implications of this study are considered under the three categories of academic, managerial, and technological perspectives.

### Keywords

Second Life, Social Virtual World, education, motivations, Uses and Gratifications theory.

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## **Second Life adoption in education: A motivational model based on Uses and Gratifications theory**

### **Abstract**

Social Virtual Worlds (SVWs) are increasingly being used in education; however, little is known about how personal motivation affects engagement in online learning courses (e-learning). This article focuses on Second Life which is one of the better known SVW platforms and allows relationships to develop amongst people who share similar interests and/or activities. The aims of this study are twofold: (1) to analyse the motivation of Second Life users with regard to e-learning; and (2) to propose a model that explains and predicts the adoption of Second Life in this context. This model has been defined under the postulates of the Uses and Gratification theory (Blumler & Katz, 1974; Swanson, 1987) which comprises the seven constructs of convenience, entertainment, socialising, status seeking, information seeking, sharing experience, and continuance intention. A web-based survey is reported. Findings confirm the positive influence of convenience, sharing experiences, and entertainment on the intention to continue to use Second Life e-learning, and the positive impact of status, and information seeking on sharing experiences. Implications of this study are considered under the three categories of academic, managerial, and technological perspectives.

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## 1. Introduction

Second Life is an online service that aims to construct three-dimensional Social Virtual Worlds (SVWs) in order to build relationships synchronously among people who share interests and/or activities (Memikoğlu, 2014). This is summed up by Greiner, Caravella and Roth (2014) who affirm that Second Life is purely a social environment with no particular stipulated goal of participation. It can be accessed via virtual embodiments (avatars or residents) through which users can interact verbally and non-verbally (Barnes & Pressey, 2011; Locher, Jucker & Berger, 2015). Another feature of Second Life is that it is made up of two types of land regions, namely, mainland and islands with the latter defined as private regions (Second Life, 2015). Both are places where you can work alone or with other users constructing homes, although there are some differences with regard to the rules in terms of the legal rights of the properties. Figure 1 shows an example of an island in Second Life.



**Figure 1. Texas A&M University Second Life Campus**

Second Life is part of social media and according to the social media classification proposed by Kaplan and Haenlein (2010) it has the highest level of social presence, self-presentation and disclosure. This is thought to be because it attempts to replicate dimensions of face-to-face interactions (i.e. non-verbal communication and a ‘personal touch’) in a virtual environment. However, it is not easy to identify the number of users as there are no official registrations. Estimates suggest that during the last 10 years, Second Life users have spent the equivalent of 217,266 years of time in-world (Hassouneh & Brengman, 2014).

From an educational point of view, learning in Second Life centres around a set of interactive communication tools that can facilitate collaborative activities between instructors and students (Burgess, Slate, Rojas-LeBouef & LaPrairie, 2010; Jarmon, Traphagan, Mayrath & Trivedi, 2009; Pellas & Kazanidis, 2014; Schmeil, Eppler & de Freitas, 2012; Sierra, Gutiérrez & Garzón-Castro, 2012). A sense of presence is developed in the students who feel as if they are physically present in the educational centre and spending time with their instructors/professors or peers (Alenezia & Shahi, 2015). As a result, students develop new skills in Second Life, and gain a wider perspective of the subject or topic under discussion (Buckless, 2012; Ward, 2010).

Based on this, Second Life is deemed to be a rich environment that allows students, instructors and professionals to create learning experiences actively through the formation of specific environments (Chow, Herold, Choo & Chan, 2012; Memikoğlu, 2014; Sidorko, 2009). Figure 2 shows a picture of a classroom in Second Life. Here we can observe how students feel as if they are physically present in the classroom in order to spend time with their teachers or peers although they are located in different places. Further, it has been shown to meet the needs of both formal and informal education (Cheng, 2014). Cheal (2007, p. 204) found that Second Life is “part of a continuum of instructional technology tools that corresponds to twentieth and twenty-first century developments in educational theory”.



**Figure 2. A classroom in Second Life**

Floyd and Frank (2012, p. 11) found that “the education sector represents 5 percent of total regions in Second Life”. In terms of actual numbers, some estimations are that

approximately 500 universities and colleges around the world use Second Life (Alenezia & Shahi, 2015). For instance, these are some universities with islands in Second Life in order to carry out e-learning programs: for example, Alabama, Stanford, East Carolina, Hawaii, Indiana, Nottingham, Pennsylvania, Texas A&M, Virginia, Western Australia, amongst others.

This emergent application of Second Life in education has drawn attention to measuring its impact. Examples include: Sarac (2014) and Lin, Wang, Grant, Chien and Lan (2014) analysed the use of Second Life to learn foreign languages; Benetoli, Chen and Aslani (2015) studied Second Life in pharmacy practice; Grenfell (2013) explained the possibilities of the use of Second Life for Art education; Tiffany and Hoglund (2014) studied the application of Second Life in Nursery education, and Sutcliffe and Alrayes (2012) analysed the use of Second Life for collaborative learning, showing that Second Life helped motivation and socialization.

Moreover, the acceptance and adoption of Information and Communication Technologies (ICT) has been a topic of continuing interest in education. Despite the importance of this, very few studies have addressed the motives and reasons for people to start and continue to use Second Life for education and training. Some studies have analysed the critical success factors for the continuation of e-learning initiatives in general (McGill, Klobas & Renzi, 2014) but not Second Life in particular.

This study attempts to fill this gap. The aims are twofold: (1) to analyse the motivation of Second Life users in education and training; (2) to propose a model that explains and predicts the adoption of Second Life in this application area.

We based our study on the theory of Uses and Gratifications (Blumler & Katz, 1974; Swanson, 1987). This theory has recently drawn the attention of ICT researchers because it has great potential for examining Internet activity (Stafford, Stafford & Schkade, 2004). This approach is used to understand how and why people seek out specific media (Krause, North & Heritage, 2014) and it has helped researchers understand the various needs of users in media adoption.

The paper is organised as follows: Section 2 provides the theoretical background and hypotheses; Section 3 presents the preliminary analysis; Section 4 tests the model;

Section 5 discusses the findings that emerged from the analysis; conclusions addressing the implications of the findings and possible directions for future research are given.

## **2. Uses and gratifications theory and research model**

Uses and Gratifications theory is a framework for explaining user motives for particular media (Joo & Sang, 2013; Palmgreen, Wenner & Rosengren, 1985). Recent studies cite the Uses and Gratifications approach as being the most relevant of the communication theories (Ruggiero, 2015). It postulates that media consumption is intentional, and that individuals actively seek to fulfil their needs via a variety of uses (Luo, Chea & Chen, 2011). In sum, Uses and Gratifications theory hypothesises identification of the social and psychological attributes of needs, given that users consider different characteristics important when choosing between media (Wurff, 2011).

The theory can be considered an axiomatic theoretical approach (Luo & Remus, 2014) because it can be applicable to almost every type of mediated communication (i.e. traditional or interactive media). It has been applied in various media including: radio (Herzog, 1940), TV (Bantz, 1982; Weaver III, 2003), cinema (Weaver III, Brosius & Mundorf, 1993), newspapers (Leung & Wei, 1998) and the Internet (Ferguson & Perse, 2000; Flanagin & Metzger, 2001). With regard to the latter, the Uses and Gratifications theory has been applied in a wide range of topics: for example, online games (Li, Lui, Xu, Heikkilä & Heijden, 2015); Web-based information services (Luo et al., 2011; Luo & Remus, 2014); Internet news browsing (Zhang & Zhang, 2013); social networks (Johnson & Kaye, 2015) or SVWs (Mäntymäki & Riemer, 2014). This theory can thus be applied to Second Life as people's choices about partaking in this program are motivated by their desire to gratify a wide range of needs. For that reason, the main purpose of applying Uses and Gratifications theory is to ascertain why and how people seek to use Second Life to fulfil their needs, motives and gratifications.

According to Miller (2015), there are two types of gratifications: sought and obtained. Miller affirms gratifications sought are the initial expectations associated with media use, and gratifications obtained are the actual fulfilments gained. Both gratifications have a relationship because gratifications sought are continually modified by the gratifications that are obtained, which have an impact on the seeking of future gratifications. Other researchers have argued that all gratifications are essentially

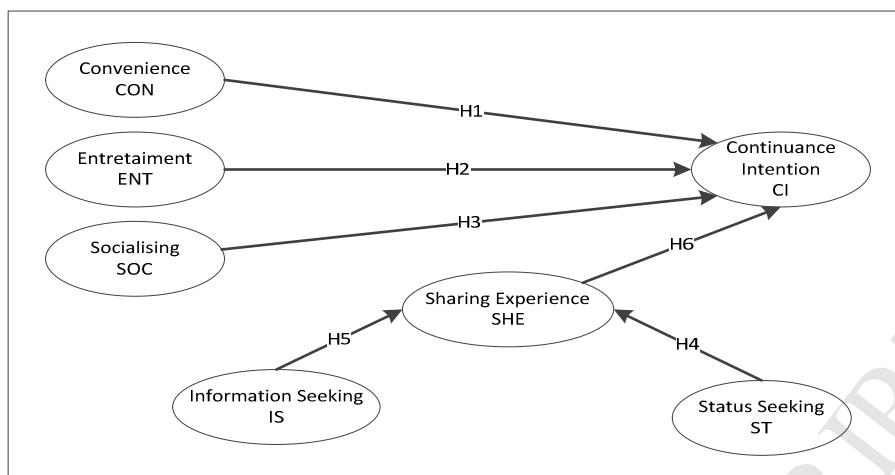


content or process gratifications. For example, Zeng (2011) clarified that content gratification results from an individual's need for direct, substantive, intrinsic gain (i.e. entertainment) whereas process gratification results from the use for extrinsic values that do not have a direct link to particular substantive characteristics of the content (i.e. information seeking).

The research model applied here is defined by seven constructs (shown in Figure 3): (1) CONvenience (CON); (2) ENTertainment (ENT); (3), SOCialising (SOC); (4) STatus seeking (ST); (5) Information Seeking (IS); (6) SHaring Experience (SHE); (7) Continuance Intention (CI). The objective is to measure the 'continuance intention' of Second Life users in an educational environment by considering the six previous gratification constructs.

Although no studies have been identified applying the Uses and Gratification theory to Second Life, it has been used frequently in the field of social media. One of the most relevant studies was conducted by Lee and Ma (2012). Their literature review indicated that most Uses and Gratifications studies on social media deal with the following gratifications: entertainment, socialisation, status seeking, and information seeking. These are considered as the key gratifications. Given that Second Life is a social media, we adopted these four variables in our model.

Uses and Gratifications theory considers that continuance intention mainly focuses on cognition-oriented behaviour (Yin, Liu & Lin, 2015). Many studies about social media have analysed continuance intention under the Uses and Gratifications postulates (Ku, Chen & Zhang, 2013). For instance, Liu, Cheung and Lee (2010) affirmed that content gratifications and new technology gratification are the two key types of gratifications affecting the continuance intention to use Twitter whilst Bakar, Bolong, Bidin and Mailin (2014) analysed the factors of gratification contributing in continuance intention to watch movies on YouTube.



**Figure 3. Proposed research model for seven constructs**

Convenience is a variable used frequently in many studies which apply Uses and Gratifications theory, and in the majority of the cases the gratifications of convenience was a strong predictor of the intention of using a technology (Luo et al., 2011; Baek, Cho & Kim, 2014). Convenience could be defined as anything that makes work easier or simpler (Park & Han, 2013). Papacharissi and Rubin (2000) considered that convenience relates to aspects such as the ease of communicating with friends or family, that is, it cheaper or easier to tell people. Gehrt and Yale (1993) asserted that convenience includes three dimensions: temporal, spatial, and effort. In this sense, convenience is a variable that make reference to using a technology without time and space limitations, and with less effort (Ha, Kim, Libaque-Saenz, Chang & Park, 2015). In addition, Ko, Cho and Roberts (2005) observed that convenience is a strong gratification in terms of staying on a Web site longer. Hence, in this study we propose that convenience is one of the main factors determining the continuance intention to use Second Life in an e-learning program. This led to the following hypothesis:

**Hypothesis 1 (H1):** Convenience will be positively associated with the continuance intention of users to participate in a Second Life e-learning program.

According to Malik, Dhir and Nieminen (2016) entertainment refers to relaxation, fun and enjoyment whilst engaging in an activity or with people. For Ha et al. (2015) entertainment is a hedonic gratification. Further, Apaolaza, Hartmann, He, Barrutia and Echebarria (2015) affirmed that entertaining should provide some kind of enjoyment for the individual allowing them to interact and engage in dialogue in order to satisfy their

emotional needs for socialisation. Previous research suggests that providing higher entertainment value is likely to lead to an advantage for media users and to motivate them to use the media more often (Vincent & Basil, 1997; Luo, 2002; Baek et al., 2014). Shiau and Luo (2013) showed that continuance intention could be predicted by the user's perceived enjoyment. In a similar way, Pentina, Basmanova and Zhang (2014) demonstrated that entertainment is a good predictor of intention to continue to use Twitter. Based on this, we proposed that entertainment exerts an influence on continuance intention to use Second Life in an e-learning program with the following hypothesis:

**Hypothesis 2 (H2):** Entertainment will be positively associated with users' continuance intention to participate in a Second Life e-learning program.

Additionally, socialising measures the extent to which social media helps to maintain relationships with friends (Apaolaza, He & Hartmann, 2014). Many studies show that socialising gratifications have an influence on technology usage (Apaolaza et al., 2015; Wu, Wang & Tsai, 2010). In a similar way, a consequence of the socialisation is the emotional satisfaction (Apaolaza et al., 2014). Socialising is important in the usage of social media to facilitate social interaction and group discussion (Lee & Ma, 2015). Wei, Lin, Lu and Chuang (2015) showed that social needs play vital roles in the willingness of users 'to stick' to a social network. Further, Cheong (2010, p. 870) considered that "the characteristics facilitating social interaction in virtual worlds also facilitate the collaboration in a team during their teaching practice sessions in Second Life". In a similar way, Andreas, Tsiatsos, Terzidou and Pomportsis (2010) concluded that Second Life improves the collaboration and communication in e-learning processes by increasing the student interest, participation and amusement. Similarly, Katovich and Chen (2014) suggested that social interaction and relationship building are key to the stability of one's identity in Second Life in an educational environment. Therefore, we expect that the socialising aspect of Second Life will have an effect on intention to continue to use an e-learning program, and the following hypothesis is proposed:

**Hypothesis 3 (H3):** Socialising will be positively associated with users' continuance intention to participate in a Second Life e-learning program.

Sharing experience is a way of socially interacting and collaborating (Karpova, Correia & Baran, 2009). In fact, people employ general social media platforms in order to share their experiences (Krämer, Winter, Benninghoff & Gallus, 2015). For instance, Pentina et al. (2014) showed that the number of followers of American Twitter users was positively affected by the amount of information sharing. Sharing experiences is also useful to achieve or attain collaborative goals (Wu et al., 2010). Research shows that information seeking in a SVW involves making new relationships and as a consequence of that, users feel the necessity for sharing experiences. In fact, Ostrander (2008) showed that one of the most dominant themes affecting information seeking in Second Life was this necessity of making new relationships. According to Lee and Ma (2012) status seeking is positively associated with prior social media sharing experience in the case of intention to share news, indicating that the experiential factor may be a possible mediator between gratification and new sharing intention. In an educational environment, sharing experiences is a method that provides opportunities to discuss and learn from each other's perspectives and is a valuable way for students to learn from each other (Karpova et al., 2009; Wu, Chin & Chen, 2009). Thus, sharing experience is a fundamental part of human to human interaction; Second Life permits this kind of interaction with real-time feedback. Applying the arguments of Kaye (2010) users are attracted to Second Life because of the opportunity to interact with diverse and rich information from many different perspectives and sources.

On the other hand, based on Wohn and Lee (2013), people develop expected outcomes primarily from observing other people, but after an individual decides to use the medium, their personal usage experience feeds back to reshape their expected outcomes. Wohn and Lee observed that if the personal experience supports expected outcomes, usage will be continued, but if it contradicts expected outcomes, the person might quit or choose to change their expected outcome or uses.

Finally, prior research has shown that status seeking is a key motivation in the use of SVWs (Li et al., 2015). Mäntymäki and Riemer (2014) considered that gaining status can be assumed to be particularly important among users who are typically in the process of building their identity and promoting their self-image. Further, Pentina et al. (2014) considered that users who can participate in transmitting important news and celebrity information may facilitate fulfilling the motivation to elevate one's visibility via 'process gratification' rather than through creating and broadcasting one's own

content. Accordingly, these arguments positively strengthen the relationship between status seeking and information seeking with sharing experience and that between affect and continuance intention, leading to the following three hypotheses.

**Hypothesis 4 (H4):** Status seeking will be positively associated with prior social media sharing experience in a Second Life e-learning program.

**Hypothesis 5 (H5):** Information seeking will be positively associated with prior social media sharing experience in a Second Life e-learning program.

**Hypothesis 6 (H6):** Sharing experience will be positively associated with users' continuance intention to participate in a Second Life e-learning program.

### 3. Methods

#### 3.1. Participants

This study utilised a web-based survey to collect data for quantitative testing of the research model. Different universities and learning islands in Second Life were visited and our avatar invited students to participate in this research. When the students confirmed their participation, we made available the URL where the questionnaire was located. The survey was conducted from February to May 2015. A total of 121 questionnaires were collected, of which five were incomplete (n=116). The demographic profile of respondents is given in Table 1.

**Table 1. Demographic profile of the respondents**

Demographic variable	Characteristic	Response Rate
Gender	Male	57 (50.45%)
	Female	56 (49.55%)
Age	Less than 25 years old	13 (14.44%)
	Between 26 and 35	18 (20.00%)
	Between 36 and 45	16 (17.78%)
	More than 46 years old	43 (47.78%)
Level of education	College/university degree	44 (40.00%)
	Master degree	24 (21.82%)
	Doctoral degree	23 (20.91%)
	Other	19 (17.27%)
Computer experience	<1 year	--
	1-3 years	3 (2.68%)
	>3-7 years	6 (5.36%)
	>7-9 years	6 (5.36%)
	>9 years	97 (88.61%)

With regard to the level of education of respondents, there were 44 college/university degree students and 47 master or doctoral degree students. This indicates the high level of education of the Second Life users. Finally, the majority of respondents have more than 9 years of experience of using computers (89%).

### 3.2. Questionnaire design

The survey instrument was developed based on a synthesis of relevant findings from prior research on the Uses and Gratifications theory. A scale for measuring the different model variables was developed using the measures from Luo et al. (2011), Lee and Ma (2012) and Ku et al. (2013). These measurement items are listed in the Appendix.

In the first part of the questionnaire, participants were asked to provide demographic information while in the second part, there were 30 variables in five categories. The respondents indicated their agreement or disagreement with these items on a five point Likert-type scale, ranging from “No at all/strongly disagree” (1) to “Exactly/strongly agree” (5).

### 3.3. Data analysis

The empirical data collected were analysed using the partial least squares (PLS) method, which is particularly suitable for identifying the variance and validating the casual relationships between latent variables comprising complex theoretical and measurement models (Chin, 1998).

In addition, PLS is recommended to test complex models with small sample sizes. In this case, the sample size of the survey is relatively small, although sufficient, to use covariance-based Structural Equation Modelling (SEM). However, Marsh, Hau, Balla, and Grayson (1998) recommended a minimum sample size of 200 for covariance-based SEM analysis. Our sample has only 116 complete questionnaires. The PLS method is more applicable with small samples in high complexity theoretical models than SEM (Willaby, Costa, Burns, MacCann & Roberts, 2015; Fornell & Bookstein, 1982). Further, it is not necessary for the data to stem from normal or known distributions to use this method (Falk & Miller, 1992).

## 4. Results

### 4.1. Measurement model

To evaluate the model fit, the first approach involved testing the construct validity of the measurement model by assessing discriminant validity and reliability. In this study, the assessment of items loadings, internal consistency reliability (Cronbach's alpha, composite reliabilities), convergent validity and discriminant validity were performed for the latent constructs through a confirmatory factor analysis (Table 2).

**Table 2. Second Life motivation item loadings**

Item/latent constructs	Item reliability	Composite Reliability	Cronbach's Alpha	Average Variance extracted (AVE)
<b>Convenience (CON):</b>		0.911	0.911	0.630
CON1	0.784			
CON2	0.778			
CON3	0.860			
CON4	0.789			
CON5	0.740			
CON6	0.805			
<b>Entertainment (ENT):</b>		0.924	0.924	0.710
ENT1	0.895			
ENT2	0.906			
ENT3	0.879			
ENT4	0.804			
ENT5	0.713			
<b>Socialising (SOC):</b>		0.885	0.885	0.719
SOC1	0.861			
SOC2	0.807			
SOC3	0.874			
<b>Information Seeking (IS):</b>		0.902	0.902	0.755
IS1	0.843			
IS2	0.932			
IS3	0.829			
<b>Status (ST):</b>		0.895	0.895	0.630
ST1	0.853			
ST2	0.789			
ST3	0.824			
ST4	0.780			
ST5	0.718			
<b>Share Experience (SHE):</b>		0.874	0.874	0.582
SHE1	0.799			
SHE2	0.708			
SHE3	0.771			
SHE4	0.807			
SHE5	0.725			
<b>Continuance Intention (CI):</b>		0.896	0.896	0.744
CI1	0.908			
CI2	0.724			
CI3	0.941			

Convergent validity is considered acceptable when all item factor loadings are significant and greater than 0.70, the composite reliability for each construct exceeds 0.70 and the Average Variance Extracted (AVE) for each construct should be above 0.5

(Fornell & Larcker, 1981). As shown in Table 2, the loadings for all constructs with reflective measures were well above the 0.70 guideline and statistically significant at the 0.001 level (in bold), showing that over half of the variance is captured by constructs (Gefen & Straub, 2005). Also, all constructs in the measurement model exhibited good internal consistency as shown by their composite reliability scores. The AVE values ranged from 0.582 to 0.755, considerably above the threshold of 0.50. Therefore, all three conditions for convergent validity were met.

There are two requirements used in assessing discriminant validity. These are:

(1) The square root of the AVE should be larger than the inter-construct correlations (Fornell & Larcker, 1981). The diagonal elements of the matrix shown in Table 3 have been replaced, for comparison purposes, by the square root of the AVE.

**Table 3. Measurement model estimation**

Construct	CI	CON	ENT	SOC	IS	ST	SHE
CI	<b>0.863</b>						
CON	0.569	<b>0.794</b>					
ENT	0.766	0.623	<b>0.843</b>				
SOC	0.507	0.588	0.634	<b>0.848</b>			
IS	0.216	0.601	0.348	0.417	<b>0.869</b>		
ST	0.191	0.426	0.311	0.137	0.314	<b>0.794</b>	
SHE	0.506	0.550	0.759	0.551	0.463	0.490	<b>0.763</b>
Note: diagonal elements (in bold) are the square root of the shared variance between the constructs and their measures (square root of AVE)							

All shared variances between any two different constructs were less than the amount of variance extracted by one of the two constructs.

(2) The indicators should load more strongly on their corresponding construct than on other constructs in the model (Limayem & Cheung, 2008). As indicated in Table 4, the magnitude of the factor loading of any item on its corresponding construct exceeded the magnitude of its cross-factor loadings. The values in bold represent the item loadings of the construct that they are intended to measure. Thus, the discriminant validity of the scales used in the model was supported.

These results collectively suggest good measurement properties for all constructs. The convergent and discriminant validity of all constructs in the proposed research model were assured.

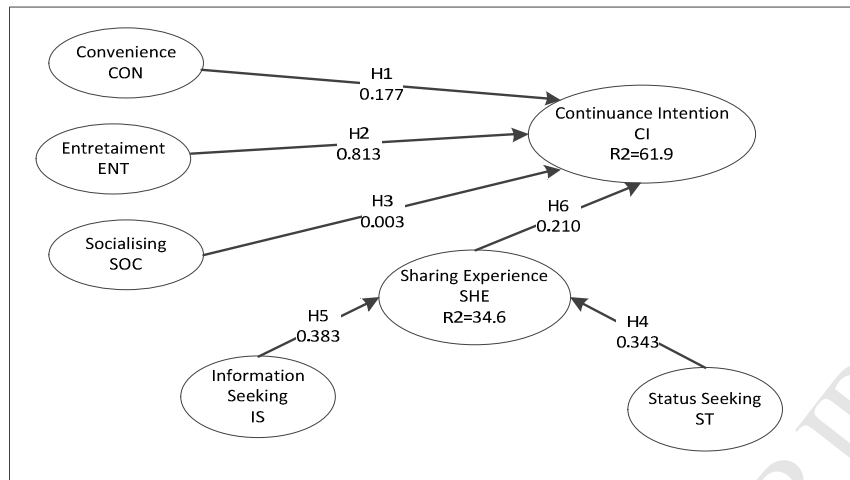


Table 4. Matrix of loading and cross-loading

Item/latent constructs	CON	ENT	ST	IS	SOC	SHE	CI
CON1	<b>0,784</b>	0,464	0,397	0,715	0,497	0,526	0,349
CON2	<b>0,778</b>	0,421	0,430	0,730	0,465	0,519	0,301
CON3	<b>0,860</b>	0,564	0,333	0,570	0,599	0,513	0,463
CON4	<b>0,789</b>	0,429	0,449	0,393	0,379	0,451	0,421
CON5	<b>0,740</b>	0,581	0,219	0,254	0,510	0,396	0,531
CON6	<b>0,805</b>	0,458	0,281	0,384	0,360	0,296	0,538
ENT1	0,557	<b>0,895</b>	0,293	0,320	0,599	0,650	0,602
ENT2	0,605	<b>0,906</b>	0,223	0,330	0,652	0,646	0,644
ENT3	0,604	<b>0,879</b>	0,158	0,309	0,609	0,601	0,854
ENT4	0,444	<b>0,804</b>	0,322	0,235	0,421	0,655	0,557
ENT5	0,352	<b>0,713</b>	0,413	0,261	0,318	0,709	0,462
ST1	0,426	0,313	<b>0,853</b>	0,269	0,117	0,388	0,218
ST2	0,354	0,166	<b>0,789</b>	0,249	0,028	0,275	0,133
ST3	0,401	0,422	<b>0,824</b>	0,274	0,295	0,581	0,264
ST4	0,235	0,039	<b>0,780</b>	0,228	-0,004	0,222	-0,014
ST5	0,161	0,038	<b>0,718</b>	0,202	-0,135	0,257	-0,029
IS1	0,450	0,224	0,390	<b>0,843</b>	0,327	0,396	0,128
IS2	0,511	0,324	0,250	<b>0,932</b>	0,380	0,454	0,172
IS3	0,626	0,367	0,172	<b>0,829</b>	0,386	0,347	0,280
SOC1	0,479	0,502	-0,028	0,309	<b>0,861</b>	0,367	0,383
SOC2	0,495	0,419	0,137	0,340	<b>0,807</b>	0,409	0,340
SOC3	0,521	0,647	0,209	0,399	<b>0,874</b>	0,581	0,527
SHE1	0,413	0,607	0,361	0,382	0,279	<b>0,799</b>	0,441
SHE2	0,297	0,562	0,443	0,210	0,181	<b>0,708</b>	0,321
SHE3	0,505	0,558	0,380	0,509	0,478	<b>0,771</b>	0,338
SHE4	0,369	0,543	0,365	0,259	0,452	<b>0,807</b>	0,386
SHE5	0,489	0,618	0,331	0,368	0,681	<b>0,725</b>	0,435
CI1	0,564	0,725	0,149	0,188	0,542	0,472	<b>0,908</b>
CI2	0,420	0,434	0,188	0,202	0,294	0,281	<b>0,724</b>
CI3	0,485	0,765	0,174	0,183	0,441	0,516	<b>0,941</b>
Note: diagonal elements (in bold) show the significance of cross-loadings (statistically significant at the 0.001 level)							

#### 4.2. Test of the structural model

The PLS analysis estimated the path coefficients of the model. The path coefficients for each relationship (Figure 4), their respective t-value, standard errors and the variance explained for the dependent variable were generated by applying a bootstrapping procedure with 200 samples.



**Figure 4. Path coefficient of the analysis**

The proposed hypotheses, H1, H2, H4, H5, H6, were supported. These results demonstrate the statistical significance of the defined relationships (Anderson & Gerbing, 1988). The results displayed in Figure 2 show that our model explained 61.9% of the variance of intention to continue to use virtual e-learning, and 34.6% of the variance in Sharing Experience. As expected, Convenience, Entertainment and Sharing Experience were significant predictors of Continuation Intention ( $\beta=0.177$ ,  $p<0.01$  and  $\beta=0.813$ ,  $p<0.001$ , respectively). Further, Status and Information Seeking had a significant positive impact on Sharing Experience ( $\beta=0.383$ ,  $p<0.001$  and  $\beta=0.343$ ,  $p<0.001$ , respectively). Finally, Socialising does not show significance; hence this relationship was not supported. The Table 5 summarises the findings.

**Table 5. Results of hypotheses testing**

Hypothesis (Path)	Path coefficient	t-value	Supported
<b>H1: CON -&gt; CI</b>	0.177	2.282*	Yes
<b>H2: ENT-&gt; CI</b>	0.813	9.345***	Yes
<b>H3: SOC -&gt; CI</b>	0.003	0.030	No
<b>H4: ST -&gt; SHE</b>	0.383	5.436***	Yes
<b>H5: IS -&gt; SHE</b>	0.343	3.566***	Yes
<b>H6: SHE -&gt; CI</b>	0.210	2.559*	Yes

Significant at: \* $p<0.05$   $t(0.05;\infty)=1,9670$ ; \*\* $p<0.01$ ;  $t(0.01;\infty)=2,5904$ ; \*\*\* $p<0.001$ ;  $t(0.001;\infty)=3,3195$

## 5. Discussion

This study has tested hypotheses on the relationship between continuance intention of Second Life in educational and training processes with regard to the following constructs: convenience, entertainment, socialising, status seeking, information seeking, and sharing experience. A Uses and Gratifications perspective was adopted for the two

objectives: (1) to identify the motivations of Second Life use in education and training; and (2) to propose a model that explains and predicts the adoption of Second Life in education.

The results are in line with previous studies which state that media consumption is intentional, and that users actively seek to fulfil their needs via a variety of uses (Luo et al., 2011). Based on Uses and Gratifications foundations, people's choices about consuming media are motivated by their desire to fulfil a wide range of needs (Joo & Sang, 2013). For that reason, the main purpose is to ascertain why and how people seek to use media to fulfil their needs and motives (Palmgreen et al., 1985; Yin et al., 2015). This research has added weight to applying the Uses and Gratifications theory as a framework for explaining audience motives for using mass media, like Second Life (Benetoli et al., 2015; Grenfell, 2013; Lin, Wand, Grant, Chien & Lang, 2014; Sarac & Lina, 2014; Sutcliffe & Alrayes, 2012; Tiffany & Hoglund, 2014).

In keeping with previous research (Lee & Ma, 2012) our research model included the most relevant gratifications on social media: entertainment, socialisation, information seeking, and status seeking. Further, according to Luo, Chea and Cheng (2011) convenience is a variable used frequently in many studies which apply the Uses and Gratification theory and in the majority of the cases, the gratifications of convenience are a strong predictor of the intention of using a technology. In a similar way, sharing experiences provides opportunities to discuss and learn from other people's perspectives and for students to learn from each other (Wu, Chin & Chen, 2009).

The findings are consistent with this. On the one hand, our results confirm that gratifications stimulate the use of Second Life in e-learning programs, and therefore, the potential of Second Life to carry out educational and training activities has been demonstrated. On the other hand, as a consequence of these findings, they indicate the opportunities for institutions of developing educational programmes via Second Life (Benetoli, Chen & Aslani, 2015; Grenfell, 2013; Lin et al., 2014; Sarac, 2014; Sutcliffe & Alrayes, 2012; Tiffany & Hoglund, 2014). In a similar way, this research has consolidated the idea that users seek gratifications when they decide to use this kind of social media (Joo & Sang, 2013). In such settings, these gratifications may be the dominant predictors of its use (Lee & Ma, 2012).

The results identified a number of variables which determine continuance intention of Second Life. Our research model, designed from prior literature and previous studies (Baek et al., 2014; Ko et al., 2005; Luo et al., 2011; Malik et al., 2016) received strong support from the data and confirms almost all the relationships as predicted. Overall, our analysis clearly confirms the positive influence of convenience and entertainment on continuance intention, and the positive impact of status seeking and information seeking on sharing experiences.

The continuance intention is explained by the model indicating that the Continuance Intention construct was predicted by Convenience (CON), Entertainment (ENT), Socialising (SOC), Status seeking (ST) and Information seeking (IS), and these variables together explained 61.9% of the variance in CI. Other studies with a structural model based on the same theoretical framework showed a high level of significance and similar R<sup>2</sup>, for example, Li et al. (2015) with R<sup>2</sup>=.61, and Basak and Calisir (2015) with R<sup>2</sup>=.62.

Further, some key findings were identified. Convenience, Entertainment and Sharing Experience have a direct influence on user Continuance Intention. These results were expected based on the findings of Baek et al. (2014), Ko et al. (2005), Luo et al. (2011), Malik et al. (2016), Pentina et al. (2014). They demonstrated that the success of Second Life in the e-learning processes depends on a combination of convenience, sharing experience and the search for more entertaining educational programmes. However, contrary to what we expected, the hypothesis relating to socialisation and users' continuance intention was not supported. Perhaps socialising in Second Life is not crucial to this aspect. Further, the constructs, status seeking and information seeking have a direct influence on continuance intention. These findings were supported by the studies of Li et al. (2015), Mäntymäki and Riemer (2014) and Wohn and Lee (2013) with Pentina et al. (2014) indicating that 34.6% of the variance in sharing experience is explained by status seeking and information seeking.

There are two main limitations to this study. First, the results would be more valid with a larger sample. Further, it might be more appropriate to use a sample where students could choose between Second Life and other alternatives. Second, the relationships between convenience and sharing experience with continuance intention have a low significance, and therefore the proposed construct may need further refinement.

There are a number of implications from the research. From an academic perspective, this work contributes to the development of knowledge about the use and adoption of social networking. So, a foundation has been laid for future studies to evaluate empirically the intention of use of a social network in an educational environment. From a managerial perspective, this article highlights how gratifications such as convenience, entertainment or sharing experience can help achieve better conditions for the use of an educational social network, in particular, Second Life. Finally, from a technological perspective, this study confirms the viability of implementing islands in Second Life oriented to offer educational programmes using this social network.

Further, the use of a social network for education can be assumed to be an alternative way to carry out e-learning programs, thereby facilitating access to specific programmes which students would not normally have. It is therefore believed that students who find gratifications in their learning process are more likely to adopt a Second Life.

## **6. Conclusions**

Analysing the main gratifications for using new media technologies is an interesting topic. However, little research has tested the intention to use Second Life, and more specifically, none have been found which looked at training and education. This study has been an attempt to rectify this. In order to investigate the factors that influence successful continuance intention of Second Life in e-learning processes, this study extended the Uses and Gratifications framework, and demonstrated the impact of gratifications on users' intention to use the program.

The findings provide useful data for clarifying which are the most relevant motivations for using Second Life in education. Overall, our analysis clearly confirms the importance of some gratifications in the use of Second Life such as convenience, entertainment and sharing experience. It was found that the intended use of a SVW in our study is much higher than results achieved in similar studies. We believe that these results are due to the direct and positive influence that the selected constructs have in acceptance and adoption. In this sense, educational institutions can benefit from the findings, and design more suitable educational programmes in order to draw in new students and to increase their Internet presence. Forthcoming studies should consider adding additional factors in order to improve the empirical reliability and validity of the

model. Finally, this study indicated the utility of using Second Life instructor-student and student-student interactions. More work on this phenomenon will help us to determine more about the advantages and disadvantages of Second Life in the implementation of new programmes.

ACCEPTED MANUSCRIPT

## APPENDIX

## Questionnaire

Sources: Luo, Chea and Chen (2011), Lee and Ma (2012), Ku, Chen and Zhang (2013)

Construct	Indicator	
Convenience (CON): measures the extent to which Second Life e-learning save students' time and/or effort in accessing the University.	CON1	I use Second Life to access information quickly
	CON2	Information is easy to obtain
	CON3	I use Second Life to access educational information from home
	CON4	I use Second Life to see how universities stand on e-learning
	CON5	I use Second Life as a new way to do learning
	CON6	I use Second Life to keep up to date on the latest e-learning process
Entertainment (ENT): refers to the way that e-learning through Second Life serves as a means for entertaining and escaping pressure.	ENT1	I use Second Life because it is entertaining
	ENT2	I use Second Life because it is enjoyable
	ENT3	I use Second Life because it's fun to try out new things like the Second Life e-learning process
	ENT4	I use Second Life because it helps me to relax
	ENT5	I use Second Life to express myself freely
Socialising (SOC): measures the extent to which Second Life e-learning helps to develop and maintain relationships with people in social media.	SOC1	I can interact with people when I attend a Second Life class
	SOC2	I can keep in touch with other students
	SOC3	It is effective to exchange ideas with other people
Information Seeking (IS): refers to the extent to which learning in Second Life can provide students with relevant and timely information.	IS1	I use Second Life e-learning because is a new way to do learning
	IS2	I use Second Life e-learning because it is easy to retrieve information when I need
	IS3	I use Second Life e-learning to access educational information at any time
Status (ST): describes how students who participate in a Second Life e-learning process are helped to attain status among peers.	ST1	It helps me feel important when I receive classes in Second Life
	ST2	It helps me to gain status between the rest of students
	ST3	I use Second Life to find more interesting people than in real life
	ST4	I use Second Life to show that I am already a university student
	ST5	I use Second Life to not look old-fashioned without an Avatar
Share experience (SHE): measures the extent which users shared their e-learning experience with virtual students.	SHE1	I use Second Life to occupy my time
	SHE2	I use Second Life to overcome boredom and loneliness
	SHE3	I use Second Life to give me something to talk about with others
	SHE4	I use Second Life to meet people and do things I don't do in real life
	SHE5	I use Second Life to meet people with the same interests as me
Continuance intention (CI): measures how likely respondents intended to participate in a Second Life learning process in the future.	CI1	I intend to participate in a Second Life e-learning process in the future
	CI2	I expect to participate in a Second Life e-learning process in the future
	CI3	I plan to participate in a Second Life e-learning process regularly

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## **Second Life adoption in education: A motivational model based on Uses and Gratifications theory**

### Highlights

- An analysis of the motivations of Second Life use in education and training.
- A proposal of a model that explains the adoption of Second Life in education.
- An identification of the factors that influence successful on continuance intention.
- An application of the Uses and Gratifications framework.