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Web 3D simulation-based application in tourism education: A case study with Second Life

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ABSTRACT

3D simulation-based virtual worlds, such as Second Life (hereafter SL), have been substantially adopted in educational settings worldwide. However, elaborations on such applications in regard to tourism education are still limited. In order to expand our current understanding of the applicability of SL to tourism education, this case study was designed and administered in the summer of 2011. The participants were eight college students who were majoring in travel management ($N=8$); half of them did not have any prior experience with 3D simulation-based platforms. With the design of qualitative research, the present study elicited insightful information about students' perception regarding such application. The major findings of the present study disclosed participants' supportive attitudes toward SL in providing training related to tourism knowledge as well as communicational and interpersonal skills. Learners' self-efficacy as successful future tour leaders also was enhanced.

1. Introduction

Using twenty-first-century technology to design and deliver twenty-first-century knowledge and skills to learners of Net Generation (Oblinger, 2003) has recently begun to appeal to scholars (Eaton, Guerra, Corliss, & Jarmon, 2011; Olasoji & Henderson-Begg, 2011). Discussions on the application of information communication technologies (ICTs) or computer-mediated communications (CMCs) in higher education settings as a new delivery channel have become popular in academic publications (Curtis & Lawson, 2001; Girard & Pinar, 2011; Hogo, 2010; Liaw, Huang, & Chen, 2007; Robinson, 2011; Stricker, Weibel, & Wissmath, 2011). In the past few years, three-dimensional (hereafter 3D) virtual worlds have been widely adopted by educators around the world (Mayrath, Traphagan, Heikes, & Trivedi, 2009). The cost of using Web 3D technologies for educational purposes has been reduced because of the increased network bandwidth and greater processing power of personal computers; these factors enable one to create a virtual environment with greater applicability in education or other fields (Chittaro & Ranon, 2007; Depradine, 2007).

The world has become seamless, as the distinction between the virtual world and real world is increasingly blurred (de Nood & Attema, 2006); there is an inter-reality area coined "third places" which specifically refers to online simulation-based platforms as well as the social networks (Steinkuehler & Williams, 2006). The proliferating applications of virtual reality (VR), which means creating a real world within the context of the virtual environment (VE) or virtual world (VW), are meant to help learners to understand concepts through first-person experiences (Chittaro & Ranon, 2007).

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By accounting for the popularity and functionalities of 3D virtual reality technologies, this study orchestrates a tourism education program designed on the most popular platform, SL, which is proposed to facilitate learning within an authentic context. This study aims to offer the readers a case study which describes how and why SL helps learners to experience the novelty of this new technology in actual practice.

The aim of the present study is to illustrate and explain what happens when SL is applied in tourism education. Based upon this purpose, the present study aims to answer two specific research questions:

1. How do tourism students perceive their experience of learning with SL?
2. Why do they have suchlike attitudes toward the application of SL in learning?

In order to answer these research questions, we first briefly reviewed and summarized the results of related studies that postulated that SL should be well suited for tourism education. Next, the design of this case study is described, followed by the presentation of results and major findings which could provide evidence to indicate that SL may be of great potential in regard to tourism students receiving significant learning benefits. The paper concludes with an in-depth discussion and suggestions provided for scholars and practitioners related to future research design and application of SL in the classroom.

2. Virtual worlds in higher education

In order to enhance the adaptability and versatility of their programs, higher education institutions around the world have gradually created a variety of virtual learning environments for their students (Brodie, 2009; Bronack et al., 2008; Dale, 2007; De Lucia, Francese, Passero, & Tortora, 2009; Hsu, 2011; Mapuva & Muyengwa, 2009; Robinson, 2011). As the web technologies have exponentially developed from Web 1.0 to Web 2.0, more interactivities are transforming into various types of virtual worlds. In the present study, the terms virtual learning environment and virtual world are interchangeable for their identical functionalities in applications. According to Twining (2009), virtual worlds enable teachers to infuse playfulness into the course design. Meanwhile, researchers are exploring the potential of such virtual worlds for enhancing students' learning knowledge and collaboration among them (Ibáñez et al. 2011; Jarmon, Traphagan, Mayrath, & Trivedi, 2009; Klinger & Coffman, 2011; Lee, 2009), which attests to Price's (2008) postulation that "virtual worlds also have the potential to enhance and enrich education. Such technologies can bring learning to life in a way that is not readily matched by other digital media" (http://www.computing.co.uk/ctg/analysis/1831325/virtual-skills-real-world). In regard to the use of on simulation-based programs in the virtual worlds for practical training or experiential learning, this issue is increasingly being examined in academia (Chittaro & Ranon, 2007; Hamalainen, 2008; Jarmon et al., 2009). Results of prior studies (Chen, Chen, & Liu, 2010; Hew & Cheung, 2010; Mason & Moutahir, 2006; Willems, 2009) have posited the promising potential of experiential simulation-based virtual worlds being used as instructional tools in educational settings.

3. 3D simulation-based virtual world and Second Life

Zemsky and Massey (2004) indicated that students enjoy learning through technology while being entertained by the graphic content and music as well as the ability to collaborate with each other online. Simulation-based learning in the virtual worlds intensified the exploitation of new paradigms of higher education, particularly in hospitality education (Penfold, Ma, & Kong, 2007). SL, the most well-known platform in the 3-D virtual world (Barnes, 2010; Jin, 2009), was created and developed by Linden Labs (Gollub, 2010). According to a study conducted by Gartner Inc. (2007), 80% of active users of the Internet will possibly have a "second life" in the 3-D virtual world by 2012 (cited from Jarmon et al., 2009). Virtual worlds, such as SL, provide learners with a representational-rich mediated environment and this virtual reality (VR) tool facilitates residents' interaction through text chats and conversations through avatars (Jin & Lee, 2010; Meggs, Greer, & Collins, 2011; Peterson, 2010). An avatar is defined as a "user embodiment in a collaborative virtual environment" (Gerhard, Moore, & Hobbs, 2004, p. 5) and avatars along with virtual world enable learners to have the sense of "being there" through telepresence or teleporting (Schroeder, 2002). The most advantageous feature of simulation-based virtual worlds is the affordance of staging situations which are challenging to set up in real life, while a user's real behavior can still be retained and manipulated (Kozlov & Johansen, 2010; Mayrath, Traphagan, Heikes, & Trivedi, 2011).

In line with the perspective of Monahan McArdle and Bertolotto (2008), the advent of 3-D virtual environments has transformed the web-based learning platform from exclusively text-based to a more immersed and interactive one; they also pointed out that navigation skills are challenging to the novices of 3-D computer games. Even so, participants in their research expressed a kinship to learning communities created by a virtual reality learning environment while their motivation to engage in the learning tasks was enhanced as well. Among all these 3-D virtual environments being used as a platform for educational purposes, Second Life is the top one in terms of popularity as well as affordances (Jin, 2011; Meggs et al., 2011; Warburton, 2009).

4. Second Life and its application in an educational setting

The applicability of SL has gained significant attention in higher education (Inman, Wright, & Hartman, 2010; Mayrath et al., 2011; Salmon & Hawkridge, 2009); up to date, more than 400 higher educational institutions are conducting instructional activities on the Second Life (Smith & Berg, 2009). Concerning applicability, the value of SL has been acknowledged as a supplemental tool for professional training (Dalgarno, Lee, Carlson, Gregory, & Tynan, 2011; Eaton et al., 2011; Hobbs, Brown, & Gordon, 2006; Lee & Berge, 2011; Steinkuehler & Williams, 2006). SL has been widely used in academic contexts and the most commonly used fields include: computer studies, science and humanities, design training, language, and tourism (Livingstone & Kemp, 2006). Therefore, academic studies have focused on the application of SL in educational settings. For example, in the field of language education, SL has been adopted as a venue to facilitate immersive learning. Numerous studies (Henderson, Huang, Grant, & Henderson, 2009; Mayrath et al., 2009; Rankin, Gold, & Gooch, 2006) and Peterson (2010) demonstrate the positive effects of SL or other similar platforms, such as enabling learners to achieve better learning outcomes of the target language. Scholars in other disciplines which accentuate experiential learning have also conducted some empirical studies; Keskitalo, Pyykkö and Ruokamo (2011) asserted that SL could trigger meaningful learning in a business course involving an experiential-learning project of civil engineering.

The study conducted by Stieglitz and Lattemann (2011) confirmed that virtual worlds like SL can facilitate experiential learning. The rationale of experiential learning is based on Kolb's (1984) learning cycle which emphasize the importance of learner's observation and engagements in the experimentation. Individual's being able to be immersed and interacted in the like-real environment of SL offers him/her chances for assimilation and accommodation to integrate new knowledge with existed knowledge. Their work pointed out that the applicability of SL was not the same to different subjects. SL worked better in entrepreneurial training course than Life Science course and thus, it is assumed that SL also has similar applicability in tourism education.

As discussed above, SL is a computer-based, highly participatory, highly authentic environment which engulfs the learners being immersed in a virtual world that appears to be 'real'. This "online rapid collaboration platform" extends the technological affordance of the virtual learning environment (VLE) from Web 2.0 to Web 3.0 (Eaton et al., 2011). Furthermore, SL enables users to have virtual physicality as well as interactive socialization; these differentiate it from other forms of CMC and face-to-face interaction (Green-Hamann, Campbell Eichhorn, & Sherblom, 2011). However, researches focused on synchronous interaction in the virtual environment such as SL are sparse (Green-Hamann et al., 2011), which encouraged the design of this study. To the author's best knowledge, academia as well as the tourism industry are still calling for research on the application of SL in tourism education and training.

However, SL also has its own limitations when being applied in the educational settings (Lee, 2009; Warburton, 2009; Warburton & Perez-Garcia, 2009). For example, technical difficulty that the instructor as the facilitator may be challenged because not all the instructors are equipped with high level of digital literacy (Amichai-Hamburger, 2002; Samur, 2011; Wang, Lefaiver, Wang, & Hunt, 2011; Warburton, 2009). Learners' motivation will possibly diminish because of technical problems they experienced with virtual worlds. In a research administered by Cheal (2009) showed that users' negative feedbacks toward SL emerged after they experienced the barriers of technology, which referred to learners' conceptualization toward virtual learning environment as well as computer hardware.

Requirements for computer hardware, graphics-card and the bandwidth of internet are also critical issues that need to be taken into account (Bell, Peters, & Page, 2007; Condic, 2009; Deubel, 2007). There are only handful brands of graphic cards support the operation of SL (Avanzato, 2007). Furthermore, instructors may need to change their teaching styles to accommodate the unique features of SL (Hawkridge & Wheeler, 2010). SL is an open platform, outsiders' harassments or intrusions occur occasionally within SL (Warren, Palmer, King, & Segrave, 2008), which may "contaminate" the learning environment with their inappropriate discourses or false information (Jacobson, Kim, Lee, Lim, & Low, 2008; Wongtangswad, 2008); moreover, Instructors will need to be aware of the cyber-security issues caused by "griefers" (Ward, 2010).

From the perspective of learners' cognitive load, caution has been advised by Mayrath et al. (2011) when SL is utilized by the course instructor. Scholars have argued that learners' working memory load may be overloaded because of rich multimedia effects as well as profound opportunities of socialization delivered to them in the SL (Chang, Kinshuk, Chen, & Yu, 2012; Chen & Wan, 2008; Moreno & Mayer, 2007). Because of these abovementioned drawbacks, some instructors are hesitant to use SL in their teaching.

5. Second Life and tourism education

The Tourism Industry has been considered as an industry with great demands in information technology for daily operation (Cantoni, 2009); therefore, the calls for increasing tourism programs offering graduates' competence in using ICT highlight the importance of integrating relevant training in ICT within the syllabi (Lee & Wicks, 2010). Given the fact that the trends of webification and digitalization have dominated and revolutionized the landscape of tourism education, as indicated by Sigala (2002), cutting-edge ICT-based technologies such as the 3-D simulation-based virtual world are considered an instructional tool that enables learners to visualize and experience actual operations in the real world through the scenario-based learning process (Penfold et al., 2007). Furthermore, simulation-based or scenario-based learning environments are able to offer advantages of "conflict-resolution skills," "interpersonal skills" and "changing one's own behavior" (Edelheim, 2007). However, reports on the implementation of SL tourism courses or pertinent research on the effectiveness of as such instructional

approach are scarce. The researcher is only aware of two studies (Huang, Backman, & Backman, 2010; Penfold, 2008) which have discussed this issue in regard to hospitality and tourism education.

Penfold's (2008) study explored the application of SL in hospitality and tourism education. The results of his study showed the advantageous effects that SL can engender. With quantitative methodology, this study offered empirical evidence on using SL in hospitality and tourism education; nevertheless, two things still call for further study. First, his work focused on hospitality training and not the tourism side. Second, the survey-based approach in Penfold's study precluded an in-depth interpretation of its results. In other words, more insightful information, such as learners' behavior in the SL, was not covered in his study. In the field of tourism education, no research has been conducted on the exploitation of e-Learning or any other advanced ICTs (Cantoni, 2009).

The study conducted by Huang et al. (2010) examined students' attitude toward learning in the virtual world of Second Life from the standpoint of Flow Theory. With the adoption of simple regression models, they argued an individual's behaviors within the virtual worlds as well as his/her attitude toward e-learning are influenced by the flow experience. However, their study shed more lights on describing the relationship between the antecedents of flow and participants' feedback on using Second Life rather than specifying the affordance that Second Life can provide in educational setting. Just like a major drawback of Penfold's (2008) study, results of statistical analyses offer empirical description of the relationships between proposed variables, limitations exist when insights on the issues of "how" and "why" these relationships constructed are in need.

6. Framework for the study

Given the fact that SL has great potential to complement the shortcomings of traditional instruction while academic research on its use in tourism education is limited, an SL-based Tourism course was undertaken as a complementary project for Travel Management students. The aim of this program was to depict the usability and applicability of this innovative 3-D simulated base platform in light of facilitating learning and optimizing instruction at tertiary-level tourism education. A free island of Paris with the focus on the Eiffel Tower and the *Arc de triomphe de l'Étoile* constructed by an SL community (code name: Admicile) was exploited as the home base for SL activities. This pilot course was designed and implemented in the summer of 2011 (6/27–7/29); the total time of interaction was 30 h. Participants were supposed to meet at the SL for five hours per week for interactions. The participants who voluntarily joined this program included eight females from a Travel Management Department; half of them had no experience in using 3-D virtual worlds or SL before the onset of the program.

At the first meeting on June 27, the recruited participants attended the orientation which aimed to help them set up their SL accounts and create their avatars. Furthermore, in order to reduce the awkwardness that participants might experience, as asserted in various studies (Delwiche, 2006; Mayrath et al., 2009); tutorials on how to use SL, including communication and navigation, were also delivered. The participants also undertook communication and navigation activities design to assist in their familiarization with SL. A walk-through of the virtual world was led by the researcher at the end of the orientation. Additionally, the SL-based materials mapped participants' current level of knowledge in subject matters as well as technologies since complexity of the simulation is acknowledged as a major factor de-motivating learners in regard to engagements (Edelheim, 2007).

The primary idea of the program was to provide learners with more first-person experiences to familiarize themselves with the work context of being a tour leader. The rationale was to offer tourism students opportunities to be in famous tourist

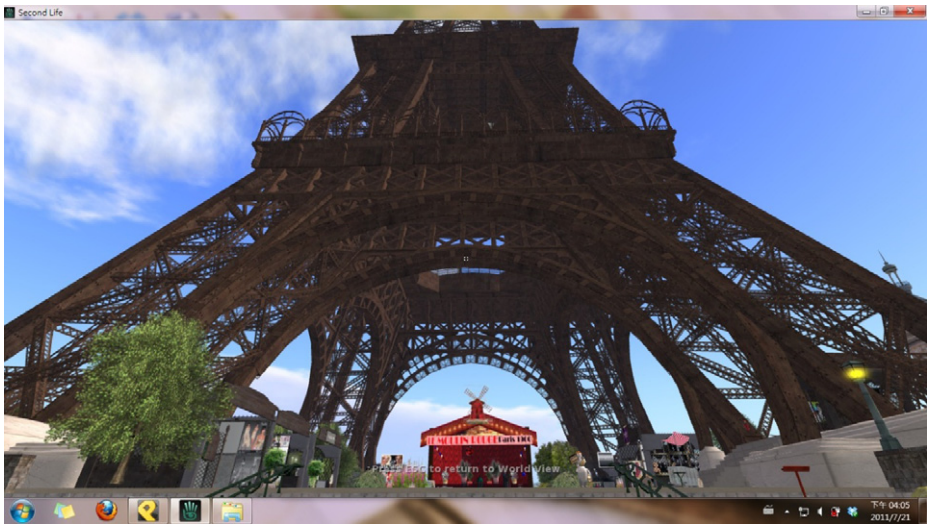

Fig. 1. The Eiffel Tower in the SL.

Fig. 2. The SL affords the presentation of items of interest from various angles.

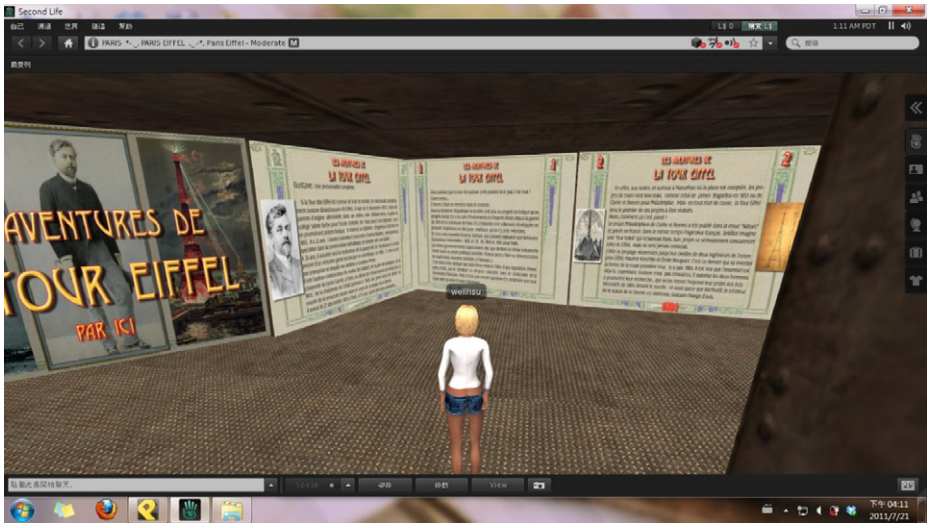

Fig. 3. The Avatar is in the SL.

destinations in Paris by means of experiences in the virtual world as such practice is either impossible or too costly to be organized in the real world. The activities comprised the procedure of organizing and leading the tour as well as skills required for an exhaustive introduction to Paris. In this online program, students were placed in the virtual environment wherein an illustrative 3D model enabled them to view the city from various angles. Figs. 1–3 depict the graphics and activities on SL.

7. Methodology

The design within the virtual world was a case study to examine a holistic phenomenon of a specific course within a 'real-life context' as it unfolded in practice (Flyvbjerg, 2004; Merriam, 1998; Stake, 2008; Yin, 1994). The case chosen with the boundaries indicated that the scope of the present study focused on the SL-based tour leader training program offered by a Travel Management Department of a public university in southern Taiwan in the summer of 2011. In order to appropriately address the research questions, the present research adopted the approach of a holistic single case study (Baxter & Jack, 2008; Yin, 2003a,b).

The researcher played the role of an inside observer (Creswell, 2005) as one of the participants who attended all the activities from the orientation to the following instructional sessions. Interviews was another strategy used to collect data for its being acknowledged as a common and adaptable way of gathering information in qualitative research (Hunt, Chan, & Mehta, 2011), particularly when the data is highly personalized (Gray, 2004). The participants were aware that they

Table 1

	Experience in SL (E)	No experience in SL (N)
Observation (O)	EO	NO
Interview (I)	EI	NI

were in a research project and their behavior in SL as well as their responses in interviews at any point could be withdrawn from further data analysis. The participants were eight female students between the ages of 20 and 22 years; four of them had no prior experience with SL or other similar online platform, while the other half were experienced users.

In terms of data collection, in accordance with Yin's (2003b) notion, a range of data was collected from multiple sources (observation and semi-structured interview) which would be mapped and converged through a triangulation approach (Brown, 2008; Creswell & Clark, 2007). The triangulated data were analyzed via a direct interpretation method (McMillan, 2008) to extract the description of the process engaged by the participants and obtain their authentic perception to this experience (Maloney & Konza, 2011). The collected data were transcribed and coded systematically, as presented in Table 1.

The participants were numbered consecutively. The coding was undertaken as "date-group-category-the number of participant," for example, if the behavior of a participant (code sign "#3") was observed and recorded on June 28 and she was inexperienced, the coding of this event would be "0628NO3." Chat histories among participants in the form of texts were recorded in the "word document" for further analyses. Refined data that had been examined with triangulation were used to answer the two proposed research questions. In order to enhance the validity of the qualitative data, the Constant Comparison Method was applied by the present study (Dye, Schatz, Rosenberg, & Coleman, 2000).

Moreover, content analysis was undertaken by a panel of evaluators for initial screening of the research design. For this round of evaluation, one instructional designer, one subject-matter expert (the professor from the Department of Tourism and Travel Management) were invited to assess the accuracy of the contents in the SL as well as the interview questions.

8. Results

This case study offers insightful information on the applicability and usability of SL in training prospective tour leaders. Two focal points derived from the proposed research questions relate to "how" participants perceive the use of SL in the training course for becoming a tour leader as well as the reasons why they have as such perception.

How do tourism students describe their experience of learning with SL?

Participants generally showed positive perceptions toward the use of SL in the training program for future tour leaders due to its simulated effects which reflect the actual activities in the real world. However, the participants who did not have prior experience hesitated to engage at the beginning until they started to become familiar with SL. Their responses toward interview questions provided in-depth explanations. For example, one participant who did not have prior experience in using SL or any other similar platform, described SL as a gateway of learning which enabled her to integrate the knowledge picked up and the practice:

[0729NI3]

> "[SL] is an interesting way of learning to me. I did not have any experience in playing online games whatsoever, so I had difficulty to manipulate the system and navigate my avatar. However, once I was used to it, I could not help but play it all the time. It was super fun and extremely practical. I didn't feel that I was learning but after the 5th session, I was suddenly aware that I pretty much knew everything about being a tour leader. Compared to the traditional face-to-face lecture, I personally prefer using SL for this kind of training."

Another novice participant made positive remarks on the affordance of SL where experiential learning can be practiced.

[0729NI1]

> "The affordance of SL is amazing. I had a great experience with it albeit some difficulties that I encountered at first….SL provided me with a venue to apply what I had learned in the class to real life situation. I don't know if there is any other way to do it like SL…"

Their engagements mirrored the phenomena. The results of observation of their behavior indicated her disentanglement at the beginning and she had made no contribution until the third session. Even after the subjects engaged, their interactions still focused on solving technical problems at the earlier stage.

[0706NO3]: How can I change the outfit for my avatar? What can I do to make my avatar move more smoothly?

[0706NO1]: Can it be more complicated to control my avatar? Someone please give me a hand…

[0718NO3]: Wait…I have to catch up with you guys…Please show me how to fly from one island to another?

[0721NO3]: Now I think I am able to navigate my avatar; I'd love to change her outfit every time we meet…but don't worry, I am not going to change her name so you can still recognize her…

[0721NO1]: Hey guys, it is super fun to be here right? How about let's meet up here every day? I know that I will be here almost every day to explore other islands…

Participants with prior experience of SL or other similar platforms also had positive perception toward learning through SL. However, their focus in experiencing SL was on the contextualization of learning materials as well as its applicability. Since they are regular users of simulation-based virtual worlds, SL was not foreign to them. Their concern was more on the applicability of SL instead of its novelty.

[0627EO1]: Why is the so-called SL good for our learning? I very much want to know how it can be used for learning and teaching.

[0629EO1]: Wow…I love this platform for being able to learn by playing. Can I go to other islands for adventure?

[0706EO1]: I played in the SL for more than 10 hours last week. It is super fun and I also visited some interesting islands such as the *Musée du Louvre*. You guys should check it out sometimes…

[0718EO1]: You know what, I met some interesting people at SL and they were from various countries. One French guy liked to communicate with me in French so I believe my French will improve dramatically…

Her positive attitude toward the SL was enhanced after she acted as the tour leader in these two SL venues.

[0729EI1]

> "I really love this innovative way of learning. It is so cool and I have gained some practical experience as a tour leader within this virtual world…The contextualized environment familiarized me with the knowledge about this place as well as honed my interpersonal skills. I will definitely visit this virtual world after this project for it is not only interesting but also educational. More than that, I will invite some of my friends to register in the SL and we can plan our next trip to exploit it."

[0729EI4]

> "We should have more similar projects administered via SL because I can actually perform and do something with it while learning. It is really helpful for me to do real things…I always wanted to be a tour leader so I have studied really hard but I always doubted my competence to be a good tour leader since I did not have any chance to actually lead a tour. After my very first time in leading the tour, I have confidence in myself in spite of this experience having taken place in the virtual world.

[0729EI3]

> "…I believe that [SL] should replace some of the class lectures, especially in the tourism course. Being there to experience everything means more than just sitting there and reading the cases from the textbook…"

From the comments made by the participants, it is ostensible that they concurred on the positive experience they had while learning with SL. Even though some of them encountered technical difficulties at the beginning, they figured out the benefits that SL could eventually bring to their learning, which also included increasing their self-efficacy in professional training. Another advantage that participants acquired was the opportunities for interactions among community members, which were of great assistance for their constructivism and experiential learning. These benefits will promote meaningful learning to these participants as posited by Keskitalo et al. (2011).

Why do they have suchlike attitudes toward the application of SL in learning?

Based on the results of the previous research question, it is noticeable that participants with or without prior experience in 3D simulation-based virtual world had positive feedback toward SL; however, the reasons differ. The major difference lies in the different values that SL puts forth in their learning. In other words, the cynosure of novice learners was the novel and interesting functionalities that SL was able to offer. For example, one participant discussed the tangibility of SL:

[0729NI1]

> "I think the affordance of SL in terms of experiential learning impressed me the most. Before this experience, I never knew that I could gain so much hands-on experience while still learning, especially about being a tour leader. There is no way for me to actually go to Paris to put what I learned about this city into practice. This functionality does mean quite a lot to me because it has strengthened my self-efficacy of being a successful tour leader."

[0729NI3]

> "One thing I like about learning with SL is its interactive and evocative nature. In the real world, actually leading a group for a tour in Paris is an impossible task but over here, in the past few weeks, I have not only been to these two important tourist spots in Paris, but also led a tour there. I will remember everything that I have experienced here including my classmates' leading as well as mine."

On the contrary, experienced learners reported about what they could do at SL in regard to the notion of experiential learning. Interacting or socializing with others in virtual worlds is no longer a new experience to them. Their focuses were rested on how experiential learning with SL which enabled them to internalize the new information and then integrate

with the existed knowledge to create meaningful learning to them (Beard & Wilson, 2002; Houser et al., 2011). They appreciated the quality of interactions instead of the quantity and the excerpts below depict their reflections.

[0729EI2]

> "I think the depth of engagements is my primary concern about the application of SL in tourism training. I have played many similar 3-D simulation-based games but SL has the greatest potential for being utilized in educational settings. I feel that I could actively engage in the activities which were meaningful and educational. This is totally different from what I perceived about such platforms. Besides, I enjoyed spending time with the community that we formed at SL. We should have more courses designed with using SL as the instructional tool in the future and I will definitely join the project again."

[0729EI4]

> "The embodiment of SL in tour leader training was successful for me… Competencies of leading a group require professional knowledge in tourism as well as some skills such as communicational skills that I might not be able to learn from the books. Experiential learning should be the best way to acquire these competences…SL can be considered as a suitable tool for such learning."

[0729EI1]

> "To me, interpersonal skills are the most valued knowledge that I obtained from this project…SL provides a great venue for me to do it where everyone is able to express his/her thoughts without any barrier. With the avatar to represents himself/herself, an individual's affective filter seems to be lowered so people tend to speak up here. Therefore, I have to pay attention to, and respect, others' perspectives…"

In summary, participants expressed that SL is an innovative yet effective way of learning, which perfectly integrates theory and practice. More importantly, learning with SL endeavored meaningful learning to them while interacting with other community members. Through interacting with other community members, learners are able to acquire new knowledge out of the process of doing, observing, reflecting, assimilation and accommodation (Kolb, Boyatzis, & Mainemelis, 2002). Even though they might have different reasons for support this mode of learning and teaching, their perception toward it was one-sided. This result is aligned with the growing popularity of the virtual world among the digital natives who spend much time in the virtual world.

9. Discussion

This case study was designed to advance our current understanding about adopting SL in training future tour leaders. Qualitative data yielded from observation as well as interviews were set for analyses to answer the two proposed research questions. Participants of the present study postulated that their experience in learning through SL was different from other text-based online or face-to-face courses and their feedbacks were unanimously positive. The persistent and open attributes of SL provide the students or visitors around the world with the opportunity to walk (or fly) through the virtual environment as exploited by the present study; it has been confirmed that such a feature provides learners with additional contextualized opportunities for learning (Luo & Kemp, 2008; Novak, 2010).

Furthermore, SL also impressed the participants with its rich 3-D contexts which resemble real life environments and thus create a stronger sense of tangible and personal experience. This finding was in line with the views of Jarmon et al. (2009) and the results of previous studies such as that of Green-Hamann et al. (2011). Participants of the present study indicated that SL is a desirable tool for teaching and learning in tourism courses because they were able to acquire comprehensive and concrete understanding of the city for which they were trained to lead the tour; the "learning by doing" educational feature of SL developed their knowledge of the destination as well as problem-solving skills (Armstrong, 2003; Keskitalo et al., 2011). This study also echoed the statements contributed by prior studies (Hew & Cheung, 2010; Mason & Moutahir, 2006) on the feasibility that SL or other 3-D virtual worlds can promote learners' experiential learning because of their engagements and enthusiasm toward learning (De Freitas, Rebolledo-Mendez, Liarokapis, Magoulas, & Poulovassilis, 2010). The optimistic effect of using SL in tourism education is that students are able to actually "be there" with their own avatar in the SL but without the financial burden of physically being there (Jarmon et al., 2009; Lee & Wicks, 2010; Salmon, 2009; Warburton, 2009). This functionality supports Hamalainen's (2008) view that an "illustrative presentation of occupational situations through game-like applications seems to be one potential way to improve vocational learning and to respond to the changing needs of working life" (p. 108).

Moreover, as pointed out by the participants, SL also enabled participants to develop real-time relationships with their group members, which will be an important training for future tour guides' interpersonal as well as communicational skills. However, the provision of SL alone, just like any other ICTs, cannot guarantee learners' automatic engagement or peers' collaboration in handling tasks (Finegold & Cooke, 2006; Robinson, 2011). Appropriately designed materials and activities that can encourage students' meaningful engagements in the virtual world should be of concern to instructors as well as a potential topic for the future studies.

However, the design of materials or activities for SL cannot simply involve digitizing text-based books or documents. Web-based or the advanced 3-D virtual world paradigms of education have revolutionized the spectrum of higher education. Course designers as well as the practitioners will need to adjust their conceptualization concerning the design of materials and activities in the virtual world. The first possible challenge that they may encounter is technical literacy (Alam & McLoughlin, 2010). Not all instructors and students are familiar with this platform; therefore, their extra efforts will be expected to learn the knowledge of navigate the avatars at SL. It will be time-consuming for those who are rookies to SL to get acquitted with the system if no appropriate tutoring is provided (Cheal, 2009; Keskitalo et al., 2011; Omale, Hung, Luetkehans, & Cooke-Plagwitz, 2009; Stieglitz & Lattemann, 2011). Furthermore, how to integrate technology with educational rationale is critical when planning to use SL in teaching. The application of SL or other virtual world modes will continue to grow exponentially at the tertiary level of education as net-generations enter college; that is why many universities and colleges have set up virtual SL campuses (Lagorio, 2007). It is of great importance for the course designers as well as teachers to be familiar with this cutting-edge ICT and the instructional paradigms specifically related to it.

Another interesting point raised by participants, especially those who had prior experience with 3D simulation-based platforms, is the experiential learning experience they had with SL. They pointed out in their interview or observed conversation recorded at SL that their experiential learning experiences were enhanced with scenario-based SL. It has been proved that SL does provide students with valuable opportunities for experiential learning experience (Jarmon et al., 2009). The present study supports this statement by providing a successful case of tourism learners' experiential learning with SL. However, for students who rarely had experience with SL or other identical virtual worlds, they would need to spend more time on dealing technical difficulties than undertaking instructional activities at the onset of the course.

In terms of the exploitation of SL in hospitality and tourism education, the study of Penfold et al. (2007) portrayed the advantages that scenario-based experiential learning through SL is able to achieve, but their focus was on hospitality courses. As mentioned in the previous section of this paper, the tourism industry requires its professionals to be equipped with knowledge of technology as well as interpersonal skills; SL is the ideal environment for such education and training. However, SL is limited in providing learners the sensory experiences (i.e. the smells, sounds or sensations of visiting famous tourist destinations) of visiting a different country, which is considered an important part of a journey. It seems that learners will need to find another channel to compensate the drawback of SL. Therefore, more empirical evidence is still needed from researching the correlation of students' learning effectiveness and the applicability of SL in tourism education. The present study serves as a pilot study that can trigger fellow researchers' interest in exploring this topic.

However, there are some inevitable limitations to the present study. Future research may be conducted to counter these drawbacks. The major limitation of this present study is the fact that it is a case study with one course and a small sample size. However, the findings of the present study should make a significant contribution by expanding the current understanding of the applicability of SL in tourism education.

Another limitation that needs to be taken into account is the novice effect among SL participants, which cannot be overlooked. In the present study, half of the participants were novice users of SL and they did have different viewpoints toward using SL in tourism education. However, an in-depth investigation on the extent to which this novice effect is able to influence learners' perception regarding SL, as well as their ultimate learning effectiveness, is worth exploring, which future study may do through the administration of a longitudinal research design.

Additionally, even though there was no passive lurking participant in the present study, it does not imply that no such learner existed in the SL, especially when the number of learners grows bigger and the instructor may not be able to pay enough attention to individual learners. However, the results of prior research have shown that passive lurking did occur in SL, although inconspicuous lurking will not happen easily compared to other CMC platforms (Green-Hamann et al., 2011) because in such a context "learning happens in concert with others through mediated interaction" (Bronack et al., 2008, p. 64). Again, detailed information on the occurrence of lurking in 3D simulation-based virtual world will be valuable to scholars as well as practitioners in academic and practical aspects.

Lastly, the participants of the present study joined this project voluntarily, which implied their stronger motivation toward ICT-based learning or their explorative personality. Other learners may not take to 3D simulation-based learning as well as they did; hence, caution is advised when interpreting the results of the present study. A study with more and diversified participants can be expected to provide a more comprehensive picture of the applicability of SL in tourism education.

10. Conclusions

While the online 3-D virtual world has prevailingly become popular in the domain of higher education as well as vocational training, our understanding of its applicability in tourism education is still limited. This case study adds to the existing literature on the application of SL in higher education; more importantly, it illuminates the potential of using SL in tourism education. The tourism industry expects professionals to acquire not only knowledge in tourism but also communicational, interpersonal and technological competence. This current study revealed that SL does feature some attributes that are able to educate individuals so that they become qualified to satisfy the expectations of industry through SL tourism education and training.

The present study adopted qualitative research methodology to elicit in-depth information on the applicability of SL in vocational training from the perspective of tourism students. Data derived from on-site observations and individual

interviews were put forth for analyses to answer the two proposed research questions. The qualitative results of this present study confirmed that participants, regardless of their experience with SL or other 3D simulation-based virtual world, perceived SL as an appropriate tool to facilitate their learning about the target destinations. Furthermore, they also stated that SL is able to provide training on interpersonal and tour leading skills required by future tour guides. They might have various reasons for their positive impression of learning through SL; for participants without prior experience, their reasons were mainly the novelty in course designs, while they experienced their counterparts' positive perception derived from their competence development. Furthermore, their self-efficacy of being successful tour leaders in the future was enhanced by having first-hand experience of leading tours via SL. All in all, the feedback from the participants was all positive, which attests to the applicability of SL in tourism education to a certain extent.

In the end of this paper, limitations of the research design were pointed out and based upon these limitations suggestions for the future studies were also proposed. As we already know, one of the marvels of ICT is its endless potential that has reshaped the ecology of higher education. As the teachers of net-generations who are considered as digital natives, teaching with the assistance of ICT is no longer an adventure. Some concerns have been raised by researchers such as Alam and McLoughlin (2010) that teachers who use SL as complementary or primary instructional channel should equip themselves with necessary technical skills; however, educators will need administrative support to renew knowledge to face this challenge.

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