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ABSTRACT

Virtual worlds, computer-based simulated environment in which users interact via avatars, have become popular as gaming and social sites. And yet, virtual worlds are not games, but can be targeted to various objectives. One such world, Second Life (SL), is frequently used as platform for revenue generation (e.g., Anshe Chung becoming the first SL millionaire through land sales), information and knowledge sharing (e.g., Samsung show room providing product information), and learning (e.g., Ohio University's Campus). This article describes a pilot project that leveraged these three uses, engaging business school students to develop their entrepreneurial knowledge by running a *real* business in SL's *virtual* environment. An action learning process framework (i.e. experience, understanding, planning, and action) is used as the basic theoretical framework to analyze the resulting data, drawn from student reports and project outcomes. Considering three different domains (business, technology and virtual world environment) and the associated developed skills-set (in terms of knowledge, social, and application), we formulate a three dimensional analytical view. The findings demonstrate that virtual worlds can be used to induce students' self learning abilities, as reflected for instance in the expression of a range of explicit knowledge concepts, drawn from experiential learning within projects.

Keywords

Action learning, virtual world, Second Life, social software, Web 2.0

INTRODUCTION

Using social software for learning and teaching purposes has received considerable attention over the past decades. The major impacts of these technologies on learning and teaching are that they can stimulate students' intrinsic motivation for learning (Shroff et al., 2007), help them to think deeply and develop problem solving skills through doing (Prince, 2004), encourage them to reflect what they have learned, while resulting in the construction of new knowledge (Young et al., 2003). Discussion boards and wiki allow students to exchange their ideas and formulate collaborative knowledge (Wagner and Bolloju, 2005). Being a knowledge construction tools and a social learning medium, weblogs can help students to build their own mental models and enrich knowledge resources (Du and Wagner, 2005), while online games have the positive effect of enhancing student's visual selective attention (Prensky, 2003). These technologies encourage students to actively use the Web as a resource for their self-governed, problem-based and collaborative activities. It shifts learning and teaching from traditional teacher-centered to student-centered.

The emergence of virtual worlds provides a promise for students to implement their thinking into actual actions, which helps them to evaluate the success of their ideas, at a minimum cost. Two types of virtual worlds, online immersive game-like environment and social-focused environment, can fulfill such promise. Game-like environment virtual worlds help students to solve pre-defined problems with pre-defined scenarios. Contrarily, social-focused environment virtual worlds have no-prefiend scenarios. All occurrences are generated based on the interactions among virtual world residents (virtual world

participants are called residents). Such dynamic social-focused environments are believed to be excellent platforms for students to take their thinking into actions.

In this study, learning real business skills in a virtual world was examined through the action learning perspective, and we intended to investigate the impact of a virtual world on students' implementation of their thinking into actual actions. This pilot project was designed to help business school students to develop their entrepreneurial knowledge by running a real business in a virtual environment. By examining the result of this study with our research framework, we aim at answering the following research question: How does a virtual world encourage students to develop practical skills and knowledge in developing their own REAL business through the process of action learning?

The paper is organized as follows. First, the background on action learning and virtual worlds is reviewed. A detail description of the application of action learning and virtual worlds in designing a course assignment will be given. Next, we will present our research framework, the research findings, and finally, the results and their implications are discussed.

THEORETICAL BACKGROUND

Action Learning

Traditional university curricula employ a teacher-centered model: academics lecture and students gain the delivered knowledge through attending lectures, experiential exercises, role-playing, and case studies (McGill and Beaty, 1992). Although being used for centuries (and it is expected to be used in the future), classroom teaching techniques are usually criticized of neither directly relate to actual, real-time business predicaments, nor test the always unpredictable consequences of managers' actions. Traditional classroom teaching deals with past solutions to past problems. For example, case studies demonstrates to the students one of the "best practices" of a particular problem. However, learning and working cannot be separated. In this dynamic environment, problems are always different. Students must be able to cope with problems which they have not encountered or even thought of before, thus, reflection of past experiences and take it as an action is one of the critical success factors to survive in this ever-changing environment. Action learning is one of the most important learning practices to enrich students this type of capability to face the unknown future.

In 1940s, Reginald Revans invented and developed action learning. Action learning has been commonly used in organizational training, mainly used for leadership training and executive development (Horan, 2007; Kramer, 2007). It is defined as a continuous process of learning and reflection, usually with an intention of getting things done (McGill & Beaty, 1992), and a means of developing intellectual, emotional, or physical techniques to handle real and complex business issues (Marquardt, 1999). It also focuses on achieving changes in the business issues as well as changes in the behavior of the individuals through this practices (Marquardt, 1999), therefore, it is a valuable learning process linked with and even embedded in the business (Horan, 2007).

Action learning is based on the relationship between reflection and action. It usually involves a group of people working together for a concentrated period of time. Nevertheless, it can also be applied in individual level. There are four stages of action learning process: *Experience, Understanding, Planning,* and *Action* (Pedler et al., 1986). No action is meaningful without learning and no learning is significant without action (Kramer, 2007, p. 42). Action learning is one of the most important learning practices that can improve student's abilities to face the unknown future. It helps students to transfer what they have learned in the process of solving problems today to solve other more complex workplace problems in the future (Kramer, 2007). Many organizations had adopted action learning in training their managers and executives, such as Dow Chemical (Marquardt, 2004), LG Electronics (Marquardt, 2004), Walt Disney Company (Asia Pacific) Ltd. (Horan, 2007), and university teaching (Kramer, 2007).
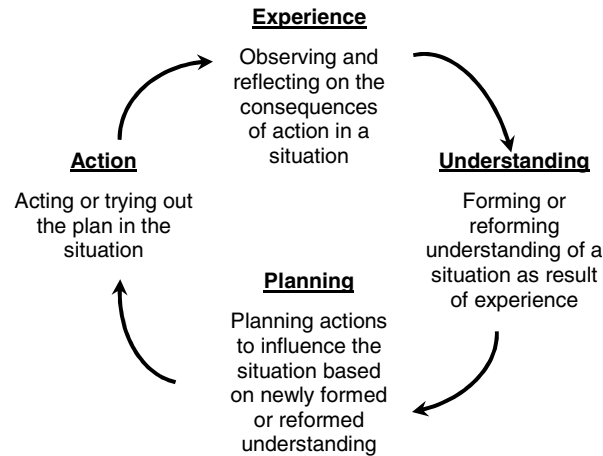
Figure 1: Action Learning Process (Pedler et al., 1986)

Virtual Worlds

Virtual worlds, also termed as "digital worlds" or "simulated worlds", are usually classified as massively multiplayer online environment (MMO). Virtual worlds are generally described as online immersive "game-like" environments where the residents can engage in socialization, entertainment, education, and commerce (Bates, 1992). Virtual worlds are actually not new, though the term "virtual worlds" seems to become common just recently. They were emerged since the mid-1980s, and some would even argue longer than that.

The definition of virtual worlds has not yet reached a consensus in academic literature. Lui and her colleagues (2007) emphasized the interactivity of virtual worlds: "fast-growing internet-based simulated environments where users can not only interact with each other, but with products and services provided by businesses and individuals" (p. 77). Boulos (2007) focused on the characteristics of virtual worlds and defined it as a "computer-based, simulated multi-media environment, usually running over the Web, and designed so that users can 'inhabit' and interact via their own graphical self representations known as avatars" (p. 233). Within the scope of this article, virtual worlds are defined as computer-based, immersive, three-dimensional, multi-media, multi-person simulation environments, where each participant adopts an alter ego and thus interacts with other participants.

Evolution of Virtual Worlds

Virtual worlds were not originally prototyped as three-dimensional and multi-media environments. It evolved from networked text-based virtual environments to desktop virtual reality simulations, and now immersive three-dimensional simulated environments (Boulos et al., 2007; Johnson et al., 1998). Its evolution is co-evolved with technology development (Mennecke et al., 2007). Three main features distinguish 3-D simulated virtual worlds from conventional 2-D Web, which are, illusion of 3D space, avatars served as the visual representatives of users, and an interactive chat environment for users to communicate. 3-D virtual worlds extend traditional classroom teaching and have already acted as a medium for constructivist learning for distance education (Dickey, 2002; 2003).

Game-Focused and Social-Focused Virtual Worlds

Virtual worlds can be categorized in two major types: game-focused and online social-focused (Mennecke et al., 2007). Game-focused virtual worlds rely mostly on fantasy and role playing, such as World of Warcraft (WOW), EverQuest, Final Fantasy, and the like. This kind of virtual worlds generally follow similar paths regarding ties to the real world and business models. On the other hand, social-focused virtual worlds have been designed to enable socialization and to function as realistic trading areas. Typical representative of social-focused virtual worlds is Second Life. Some of this type of virtual worlds have emerged as marketplaces, and provide great economic opportunities connected to the real world.

Game-like environment virtual worlds provide pre-defined scenarios to help students to solve problems which specifically exist in those situations. Contrarily, social-focused environment virtual worlds have no pre-defined scenarios, in which participants have to cope with the situations with tailor-made solutions. Social-focused environment virtual worlds are

believed to be excellent platforms for students to take their thinking into actions and to carry out a "Real" business action in a virtual environment.

Learning with Virtual Worlds

Studies had been conducted to investigate the applications of virtual worlds in education (Boulos et al., 2007; Hughes and Moshell, 1997). The computer-simulated environment of a virtual world, embedded with real world rules and regulations, makes it a good platform for collaboration and co-creation that cannot be easily experienced in other computer platforms (Boulos et al., 2007; Hobbs et al., 2006). A virtual world is thus a good candidate of being used in education as it offers opportunities for experienentail and action learning.

The value of virtual worlds contributable to learning is in three folds. Firstly, students can develop their skills and interact with other people via customizable avatars, so virtual worlds make the distance and remote learning realistic and feasible (Hobbs et al., 2006). Secondly, virtual worlds facilitate information and knowledge sharing and learning. For instance, the virtual world residents can browse documents easily in 3-D virtual libraries, which offer multiple and vivid methods for students' learning activities. Thirdly, virtual worlds provide business platforms for their residents. Buying, selling, advertising, and providing services in the virtual environments allow students to have a good practice in demonstrating their business skills. Learning by doing can thus be enhanced with such environment.

Although the Horizon report of trends in higher education identified the increasing uses of online game environment for teaching and learning purposes (Consultants, 2006), not all virtual worlds are fit for educational uses. Typical game-based virtual worlds, such as World of Warcraft (WoW), are not easily adapted to educational purposes in terms their pre-defined structure (Livingstone & Kemp, 2006). Contrarily, social focused MMOs are more suitable. For example, in Second Life (SL), there is no predefined objective, with comes with relatively easy-to-use building and scripting tools. These special characteristics make it an ideal platform to engage students in actively creating their own learning activities and experiences, rather than just being passive consumers of learning (Maher et al., 2005). In social-focused virtual worlds, many things are out of the participants' control as is in the real world. Thus, this user-generated 3D environment is able to encourage students to construct as well as apply their knowledge in their own way. Therefore, in this study, we target on the social-focused virtual world, and choose Second Life as the implementation platform.

APPLICATION OF ACTION LEARNING IN DESIGNING A COURSE ASSIGNMENT

The power and benefits of action learning are optimized when it integrates the following components (Marquardt, 2004):

A problem – the problem should be significant, urgent, and be the responsibility of an individual or a team to solve, and the solution should be of high importance to the individual, the team, or even the organization.

An action learning group – one of the core entities in action learning is the action learning group. Among the interactions between group members, an individual can gain multi-perspective views and can reflect on oneself or other members' experiences.

A process that emphasizes insightful questioning and reflective listening – action learning emphasizes questions and reflection. It focuses on what one doesn't know as well as on what one does know (p. 28). The process should start from asking questions to clarify the nature of the problem, and then members (or the individual) start to reflect and identify possible solutions, and finally move toward the consideration of proper actions to solve the problems.

Taking action on the problem – members of the action learning group or the individual must have the power to take action, or be assured that their recommendations will be implemented.

A commitment to learning – the group members or the individual must be willing to learn through the process of solving the problem. It is desirable that the outcomes of the learning can be applied in the future.

There are numerous ways to support learning with technologies. We believe virtual worlds are able to encourage our students to apply action learning practices in their study. With virtual worlds, we believe that we can assess students' learning outcomes by measuring both effectiveness in terms of concepts learned, and efficiency in terms of learning speed. Virtual world, by its nature, provides an environment for the students to reinforce what they have learned through actual implementation. We designed a course assignment with the following belief: students are able to *experience* (the students have to visit a virtual world, play around the features, and observe the actions taken by other virtual world residents), *understanding* (students can be able to organize their experiences gained through the virtual world visits and the observations of other residents' actions. They can then form a deeper understanding of the virtual world business environment), *planning* (together with the knowledge gained from the observations as well as their real life experiences, students are able to plan

what actions they are going to implement in the virtual world), and finally *action* (the actual running of the virtual world business).

The course assignment required our students to run an online business in a virtual world. Among the most popular virtual worlds, we chose Second Life as the platform for our students to build their business. Second Life (SL), one of the major social-focused virtual worlds, is suitable to the fourth generation of computer-based education (Winn, 1993), in which, knowledge is constructed by students themselves, rather than by the courseware. In SL, there is no pre-defined scenario; students are free to develop any online store according to their own will. It provides a simulation environment that allows its participants to see, hear, attempt new behaviors, use and create objects (Hughes and Moshell, 1997). In doing so, participants can create their own individual experiences and construct their knowledge, therefore, our students' constructive learning ability can be developed and their enthusiasm of engagement can be stimulated as well (Rovai, 2002).

In the assignment, students were free to build any type of business. However, they had to start from scratch. SL provided the platform for students to put their ideas into real actions. The effectiveness of these actions would then be evaluated through other "real" SL residents. The more residents visited their store, the more success the store would be. The detailed description of the assignment is as follows:

Assignment description

The course "IS for global work teams and virtual organizations" is an information systems course that prepares students for virtual work environments, developing their skills in technical and non-technical areas. In the course, we used different technologies to enrich students' learning experiences. In September 2007, students were tasked to use SL to complete one of the course assignments. This assignment was not a stand-alone exercise which was only assessed in terms of the applications of the knowledge learned in this particular course. On the other hand, the assessment criteria were integrated with the overall course teaching materials, students' knowledge gained from other courses, as well as their real life experiences.

The 4-week group assignment required 5-student teams (*an action learning group*) to build a virtual organization inside SL for the purpose of economic gain (*the problem*). Given a limited amount of resources (Linden\$3,000 = US\$12 per team), they were asked to generate revenue through the in-world economy (*the action taken*). The experiential portion of the assignment required them to rent real estate, develop a service, build a product, and attract customers in order to generate revenue (*the process*). Students also had to report on the experience, both as a business project and a system development project. On the development side, they had to create artifacts (either to sell or to furnish their online stores) and had to program using a scripting language which would give the created artifacts properties with which to respond to events. The evaluation criteria were: implementation contributed 30%, business case and design concept contributed 30%, assessment of usefulness (in terms of the revenue generated and the number of visitors) contributed 10%, executive summary and overall impression contributed the rest 30%. As it was a piece of assessment contributable to the course final grade, we believed that students were *committed to learn* new knowledge as well as to apply what they had learned previously to complete the task.

Expected learning Outcomes

In this course, there are five course intended learning outcomes. We believed that this assignment was able to assess three of them, namely, (1) set up a virtual organization by assessing and addressing the driving factors to the transformation, (2) integrate supply chain concept with the business transformation to further enhance the success of such transformation, and (3) explain the social, economic, regulatory, political, and ethical aspects in the development, implementation, and the use of information systems in a virtual environment. These learning outcomes were measured through the following three domains:

Business domain

Business knowledge – In addition to the instructors' evaluation on the business model, students were assessed by how much they earned as well as the number of visitors. As we only allowed students limited time, i.e. 4 weeks, to build and operate the stores, light weighting was assigned to the task of profit generation. However, students should be able to demonstrate their business sense in developing the business case report to explain the leverage point and their ideas to help the store perform better.

Technology domain

Technical knowledge – as it is an IS course, construction of technical skills was expected. The skill set was tested by the implementation of the store in SL. To develop a virtual store, students had to be able to create objects for their stores to sell as well as to furnish their stores. To further enhance the functionalities of their store, such as welcome messages and entrance

fee charges, students had to apply some scripting programming skills in creating the fee charges and the corresponding dialogues.

Second Life domain

To run a SL virtual store, students had to integrate business and technology skills and applied them in the virtual environment. Although SL imitates the operation of real life business, there are differences. For example, residents can fly and can speedily teleport to any locations. Such differences require the students to implement and operate their sotres differently from the real world. Therefore, their soft skills (business sense and social skills) and hard skills (technical programming skills) might be unique to SL.

Research Framework

The four stages of action learning process (experience-understanding-planning-action) (Pedler et al., 1986) are expected to be steps our students used to build up their self capability. Integrate these 4 stages with the three domains we identified, a framework for the assessment (figure 2) was developed. Under each domain, we expected the students would go through the steps of action learning process. To assess each stage, we assess different learning outcomes, including business and technical knowledge, social skills and the application of these knowledge and skills.

We foresee that it is not easy for us to observe directly the learning outcomes of stages understanding and planning. However, we can infer the occurrences of such cognitive process through the performance and actions taken in running the business. To evaluate students' learning outcomes, the submitted group projects were assessed. We evaluate the students' performance on group level. Although action learning can be applied in individual, group, and even organizational level, we only focus on the group level in this study.

		Business Domain	Technology Domain	Second Life Domain
Experience	Knowledge (business & technical)			
	Social skills			
	Application			
Understanding	Knowledge (business & technical)			
	Social skills			
	Application			
Planning	Knowledge (business & technical)			
	Social skills			
	Application			
Action	Knowledge (business & technical)			
	Social skills			
	Application			

Figure 2: Research Framework

Findings

Ten groups were formed in the class. All groups succeeded in the 4-week exercise, successfully creating a revenue-oriented business, attracting customers, generating Linden$, and documenting their findings. Students were able to do so with only a few hours of formal instruction in SL. They demonstrated SL capabilities that were significantly beyond those shown in the formal instructions. Among the groups, 3 got "A" grades, 3 got "A-", 2 got "B", 1 got "B-", and 1 got "D".

One of the "A" groups demonstrated their knowledge by implementing a virtual bridal shop called "Second Wife" (Second wife is referring to the wife in second life). The shop was able to allow customers to rent a church, clothing, and other necessities for a virtual wedding. If requested, a priest could also be hired to hold the wedding ceremony. It also coordinated and co-located with two other shops, a jewelry store and a theme park (for honeymoon travel). Commissions would be shared when one store referred customers to the other. Another group brought the store to real life. The shop arranged virtual parties

for SL residents. By experiencing the services provided in the virtual world, customers could ask for services for real life parties. Among the 10 groups, 6 of them sold services, together with some souvenirs sold in the shop while the other 4 created products for sale (see appendix for the project titles). There is not much difference in the revenue models, mainly to generate profits through selling products or providing services.

Although the students had done a good job, negative feedback was received. They complained of not having enough time for a more comprehensive job (they had to spend 1-2 weeks in learning the technical techniques of SL, then, another week to decide the business model, conceptually design the store and the products/services for sale, marketing strategy, and the rest of the time (just 1 week left) was the actual running of the shop). They complained that there was not sufficient time for them to attract more customers to generate money, which could be an important indicator of the success of their business concept.

Despite the students' complaints, they had actually performed professionally in the projects. In addition to learn through experiencing SL environment, they actively sought advices from other SL business owners. Some of the groups even join other SL discussion forums to learn techniques in creating objects and writing scripts. Demonstrations in Youtube.com were also their sources of gaining practical knowledge. Some of the students who seldom talked in the classes, but would actively seek information in the virtual environment.

Discussion

(Learning from the past experiences and put the experiences into action)

With the framework in mind, we found SL is very useful in allowing students to bring their past and new knowledge into practices. Students can apply their knowledge learned in this course, such as how virtual organization members communicate and organize their work with technologies. In addition to their physical classroom face-to-face interactions, ICT were commonly used among the student groups. Parallelism of workload is found through the allocation of work according to their expertise. For example, if a team member was good at programming, he or she was usually assigned the responsibility to write the scripts, build and decorate the store, and develop products (objects) for sale. As the Linden$ provided by the instructor was not big, some students had to work in other SL shops for money. Some students visit other stores to seek advices from the shop owners in running business in the virtual world. Some students visited other discussion forums or youtube.com to learn the techniques of building the stores and running the business. The overall performance is really impressive.

It is obvious that the action learning concept had been successfully applied in this assignment. As mentioned, this piece of assignment was not a stand-alone assignment; it was designed for students to integrate all their entrepreneurial knowledge in a holistic view to run a business. In addition to the materials taught in this particular course, student would have to apply what they learned in their previous study, especially those learned in the IS department and other business-related disciplines. The assignment provided our students a chance to reflect what they learned in the university as well the experiences they gained in real life, and then applied them to run their first real business.

Although none of the students had previous experiences in SL (according to an unofficial survey done by one of the course tutors), the students were able to demonstrate their learning with action learning practices in SL environment. We found that students had gone through the experience stage by observing the behavior of other SL residents, together with their actual SL experiences. Such reflection was evidenced by the actions being taken in the later stages. Through the interaction with other SL residents (chances of developing social skills), both business and technical knowledge was developed. Students could then apply such knowledge in the SL domain. Although we could not directly observe the students' behavior of understanding, we believed the students had tried to understand better the SL environment and operations of other SL stores. Some students joined other SL discussion forums to learn more about the environment in order to have a deeper understanding of SL features and functions. Students applied their previous technical and business knowledge and developed their business plan of running their SL business. The application of different knowledge and techniques was observed. Some students promoted their business in popular shopping halls, and some students applied cross-selling techniques to attract more customers. It is obvious that students had applied their knowledge in identifying who their customers were, what kind of services their customers would value for, how they could generate money by providing such values to their customers. And they were able to apply these strategies in the SL environment. Finally, in the action stage, 10 SL shops were operating in the SL environment with reasonably good results.

To successfully run the SL business, business and technical knowledge as well as social skills were applied. For example, the students had to interact (usually through textual conversation in SL) with other SL residents, especially those technical experts, for advices of building and running business. Such social skills could be observed in almost all stages. The application of business and technical knowledge was evidenced in the successful operation of the stores, in terms of

appropriate business models and revenue generation models (business domain) and the actual implementation of the stores (technical domain) in the virtual environment (SL domain).

One of the most important issues is that students knew their goals of this assignment, not just to set up a store, but also to generate revenue in an artificial environment. By doing so, we could see that entrepreneurial knowledge was applied. SL is really a good choice to allow students to apply what they have learned into a real situation. The beauty of applying SL is that: the students can gain "full" experiences with minimum risk. This is surely helpful to equip them for their future job in the society. Although the real society is more dynamic, the SL experiences have already given them a trial and such experience is useful for them to face this ever-changing environment. The following table shows our observationof students' learning outcomes.

		Business Domain	Technology Domain	Second Life Domain
Experience	Knowledge (business & technical)	√	√	√
	Social skills	√	√	√
	Application	√	√	√
Understanding	Knowledge (business & technical)	√	√	√
	Social skills	√	√	√
	Application	√	√	√
Planning	Knowledge (business & technical)	√	√	√
	Social skills	√	√	√
	Application	√	√	√
Action	Knowledge (business & technical)	√	√	√
	Social skills	√	√	√
	Application	√	√	√

 Remark:

**We can assess whether there is knowledge built in the "√" cells.

**We can not directly observe the knowledge developed in the understanding stage (the shaded one), but we infer such learning occurred by observing the results of later stages.

CONCLUSION

Action learning challenges traditional learning and teaching. Adopting action learning approach requires learners to reflect what they learned previously and apply the experiences and knowledge into real actions. In this Internet era, business students should be able to cope agilely in the dynamic environment. Applying action learning practices with virtual world environment really provides our students a good learning opportunity to reflect what they learned in real practices, so as to prepare them for the future. The theoretical design of our assignment, based on action learning as the theoretical framework, and the actual implementation with supportive technology, provided our students chances to experience the fruitful results of their tertiary education.

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Appendix A:

Name of the shop	Business
Christy's Ring	Selling rings Collaborating with Fantasmic Resort and Second Wife
Fantasmic Resort	Providing an environment for residents to relax and exercise Collaborating with Second Wife and Christy's Ring
Forever Flower	Selling flowers to residents (B2C) and other companies (B2B) Decorating gardens for residents
Heroes Travel Agnecy company	Arranging tour for residents
ISU Center	The only non-profit making organization, aims at Providing a platform for members to socialize Arranging tutorial to upgrade SL skills Providing a platform for residents to exchange objectives
Let's Go Party	Arranging virtual parties for SL residents (including venue, drinks, food, and music). Extending the business to offline by arranging physical parties for customers
Second Wife	A birtal shop Selling wedding-related assosorites Arranging wedding ceremony Collaborating with Fantasmic Resort and Christy's Ring
Star Wealth Gallery	Selling paintings
Super Store	Retailing business Selling various products bought from other SL shops Allowing other small shops to sell products in their shop, and commission will be charged
Theme Park	For demonstration purpose, a ghost house was built Providing entertainment to residents with virtual tour Selling clothing and accessories