VIRTEL – Teaching Hospitality with a Virtual Hotel E-simulation

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Abstract: This paper reports on the development of "Virtel," a virtual hotel for hospitality teaching and learning through e-simulations, from a pedagogical perspective. Active learning, with a strong reflective element, and teacher guided discussion will be a valuable asset to our range of teaching methods. Virtel aims to help teachers provide a realistic hospitality setting, and provide challenges and scenarios that allow students to apply their theoretical learning to situations, develop their thinking skills and develop their workplace skills. Virtel is an active learning tool that could be used by different classes and lecturers to enhance learning and skills application, and help students to face realistic workplace scenarios, and learn how to prepare and respond to live situations in a non-threatening way.
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Introduction

Today's educators face new challenges not experienced by teachers in the past. They are dealing with students who are part of the 'Net Generation'(Oblinger, 2003), brought up in a 3-D world of virtual communication, visual complexity and online identities. They want and expect more engaging, empowering and interactive learning experiences in their student life than universities are able to give them. Prensky (2001) writes of the differences between 'Digital Natives', the generation that grew up with video games and computers, and 'Digital Immigrants', people who have started using computers as adults. The digital natives are used to instant gratification, hyperlinked information, and the need for rapid reflexes, and yet they are being taught by digital immigrants, who are used to learning from books and communicating by phone. People who want to teach digital natives need to figure out how they think and adjust their methods to communicate at their level. Higher education is led by digital immigrants, using the same teaching methods used since the days of the Greek Empire – the didactic lecture. However the world has changed, and universities have been painfully slow in utilizing and harnessing the power of technology to enhance and stimulate student learning – the use of PowerPoint and email are probably the most widely used technology in academia today.

Students today are in touch with technology and innovation in their everyday lives through digital media, PDA phones and their online networks. These young people are community-focused (especially here in Asia as compared to the West), they belong to virtual

communities to discuss shared interests (communities of interest), to develop social relations (community of relationships), and to explore new identities (communities of fantasy) (Hagel and Armstrong, 1997). According to Zemsky and Massey (2004), students want to use technology in order to be entertained through music, games and movies, to be connected to one another and to present themselves and their work. Our institutions are playing catch up, and not doing it very successfully. Yet, despite this situation, there are signs of change, with learning taking place in some academic departments which demonstrate student-centred and innovative teaching through e-Learning and "Serious Games" (Annetta, Murray, Laird, Bohr and Park, 2006).

A Review of Simulations

Simulations can be described as learning by doing, as though the user is actually in a situation, and really doing something (Schank, 1997). Simulations are being increasingly used not only by industry and the military but in education. Simulations have been described as 'the e-killer application' (Lundy, Logan & Harris, 2002) and said to include role play, animation, virtual reality and games. Yet this is probably too broad a definition, as not all simulations are games, and role plays are fairly primitive simulations (Prensky 2002). Simulations are more of a system (computer-based or otherwise) that enables the user or student to interact with situations similar to those in the real world and at the same time teaching about that situation. Industry has been using simulations for many years in well known scenarios such as the aircraft flight simulator. The armed forces too are using simulators to prepare their people for active combat without killing anyone unecessarily! There is little argument that simulations are extremely effective for learning, however, not for learning everything. The use of simulation needs to be considered on a case by case basis, and as with any learning methodology, used appropriately.

"Simulations are the first fundamental change to education since the textbook," according to Aldrich (2004). His thesis is that people learn best by doing, and simulations enable educationalists to provide authentic and exciting learning experiences for students. However, time, cost, expertise and other factors make it hard to begin and finish a good simulation. Tools are being developed that make it easier to do the creative parts, but the key is in imaginative instructional design and development. Simulations can be relatively simple and extremely complex. From the gaming world, the developers of SimCity produced SimAnt and SimEarth, but both are very different. SimAnt is simple enough to be used by youngsters, whereas SimEarth is extremely difficult to manage and unsatisfying, as if you left it for any period of time the parameters of your virtual world would be eroded by the simulation itself.

Aldridge (2004) suggested there are three types of simulations – linear, cyclical and open-ended (Fig 1). Each have their strengths and weaknesses, and each have a main purpose

or outcome. Linear simulations are like movies and books – they have a beginning and ending – and although there may be different routes through the content, the end result is the same. Most e-Learning today is linear, usually includes standard tests and assessment, and is primarily owned and managed by the creator. Cyclical content is the sort of simulation used in arcade games where the outcomes depend on the skill and speed of the user. This type of content may be useful in the educational context if you need to teach a skill or precise activity, but it is less valuable as a learning tool. Open-ended content is the most challenging – for the user as well as the creator – and is very good in developing strategies and transferable skills such as entrepreneurship. An internet search would indicate that most educational institutions develop linear simulations, even at postgraduate level, or for management learning where students are making decisions in areas such as production, accounting, marketing and finance.
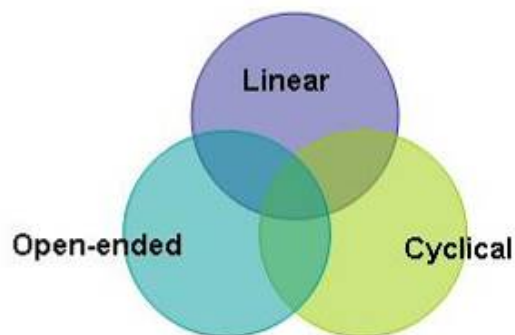

Figure 1: *Three types of simulation*

Another classification of simulation games comes from Amory, Naicker, Vincent and. Adams (1999). They tested what they called an educational simulation game, a strategy game, a narrative-driven adventure game, and a 'first-person shooter' and found that students preferred the adventure game and the strategy game to the other two. The authors broke the games down into elements and concluded that the most important are logic, memory, visualization, and problem-solving. Musselwhite (2003) classified simulations into four levels, both for students and for facilitators (Fig. 2). Participant interaction was graded according to degree of interaction, predictability of outcomes, and potential for conflict and emotion. Facilitator issues related to administrative concerns and skill level; including time to prepare for the simulation, complexity of running the simulation, number of facilitators required, level of feedback expected, and overall observation and debrief skills required.

Criteria	Participant Interaction			Facilitator Competence and Skill			
	Participant Interactions	Predictability of Outcomes	Emotional Arousal/ Conflict Potential	Ease of Administration	Individual Behavioral Assessment & Feedback	Team Assessment & Feedback	Observation, Facilitation, Debrief Skills
Level 1	Interactive	High	Unlikely but possible	Little complexity	No	Possible	Entry level
Level 2	Highly interactive	Intermediate	Somewhat likely	Some complexity	Minimal	Likely	Intermediate
Level 3	Complex	Low	Very likely	Moderate complexity	Possible	Yes	Good
Level 4	Complex	Low	Expected	Complex	Expected	Yes	Very good

Figure 2: *Simulation Level Classification Criteria*

Simulations are often suggested as a replacement of real-life situations which are too dangerous, too expensive, or impractical to allow students to experience for real. Yet providing practical experience is a key complement of the learning process, helping students learn the application beyond the theoretical context. Simulations provide an environment where students can explore, experiment, question and reflect on real life situations which would otherwise be inaccessible. In addition simulations can help students visualise dynamic behaviour, overcome practical difficulties and introduce new concepts. However many educational simulation games are poorly constructed and simply not fun. In addition, most games, even some intended to be educational, do not involve useful learning. Learning goals have to be essential for winning or the material is likely to be ignored (Lepper and Cordova, 1992). It is extremely challenging for any educational institution to develop a well produced simulation as they cannot compete on budget with industry, nor can they compete for talented game designers, as the best will be paid a fortune to join the industry. So it is likely that educational simulation games will be of a lower visual quality and entertainment value than those in the marketplace, and less stimulating. So how can educationalists produce simulations that are worth investing time and money in, and provide a worthwhile, enjoyable, stimulating and challenging learning experience? The following is an attempt by one university to do this within the constraints of time, budget and personnel.

Challenges in Preparing Students for the Hospitality and Tourism Industry
The School of Hotel and Tourism Management at the Hong Kong Polytechnic University attracts top students from Hong Kong secondary schools to its programmes each year. It provides a balanced 'applied education' with the aim of producing graduates that will be prized by the hospitality industry both in Asia and beyond. Along with a sound academic curriculum, the challenge is to provide students with a professional edge so that they can function in the real world of work. The School has a strong industrial placement or internship

programme where every undergraduate student will work in the hospitality industry for between 20-48 weeks during their study programme. For many students, to be thrust into a service industry which sets high standards of operation and personal service is quite daunting. How to prepare students for the technical challenges of front office operations, food service or dealing with high-end customers in a 5-star hotel is not something you can easily learn in the classroom. In response to this, the School is developing a workplace simulator (a virtual hotel) in which students can practice 'real world' tasks – including problem-solving, customer relations, interpersonal skills and operational procedures. We plan to use it in tutorials where the teacher can introduce and demonstrate various skills, and the students can then enter and use it to practice and experience various hospitality scenarios they would experience in the actual hospitality environment. We have built in various tasks, quests, assessments and rewards to motivate and challenge the learners.

Hospitality and tourism is a key industry for Hong Kong and recognized by the Government as one of the pillars of the Hong Kong economy. The local tourism industry reached record figures in 2005 with over 23 million visitor arrivals, up 7.1% year-on-year (Hong Kong Tourism Board, 2006). Hotel occupancy was at an average of 86% in 2005, and by June 2006, there were 601 hotels/tourist guesthouses in Hong Kong, totaling 48,197 rooms. Many hotel and tourism courses have a strong operational and customer service element, and yet students have little experience of many hospitality scenarios discussed in their classes. To help university students prepare for industry placements and eventual work, there was a need to provide them with a valid and realistic training in hotel service operations.

Developing 'Virtel' - SHTM's Virtual Hotel

Funded by the e-Learning Development and Support Section of The Hong Kong Polytechnic University, a virtual hotel (Virtel – SHTM's Virtual Hotel), was developed by collaboration between the School of Hotel and Tourism Management (SHTM) and the School of Design (SD) to provide an opportunity for students to practice customer service and operational skills in an online, multi-user 3D simulation. This paper considers the development of Virtel from a pedagogical and industry perspective. Active learning, with a strong reflective element, and teacher guided discussion will be a valuable asset in our range of teaching methods. Virtel aims to help teachers provide a realistic hospitality setting, and provide challenges and scenarios that allow students to apply their theoretical learning to situations, develop their thinking skills and develop workplace skills. Virtel is an active learning tool that could be used by different classes and lecturers to enhance learning and skills application, and help students to face realistic workplace situations, and learn how to respond and prepare for live situations in a non-threatening way. We believe Virtel can impact on student learning by equipping teachers to deliver high quality learning experiences and use e-learning effectively to help students communicate/collaborate more extensively.

The objectives of Virtel are: 1) to provide an edutainment simulation to use in foodservice, hotel and tourism courses; 2) to extend the platform for Work-Integrated Education (industrial placement) preparation; 3) to provide an opportunity for students to practice customer service and interpersonal skills in an online, multi-user 3D simulation; and 4) to provide an active learning tool that can be used by different classes and lecturers to enhance learning and skills application. The context of Virtel is allied with four hospitality courses – Front Office Operations; Housekeeping Operations; Food and Beverage Operations; and Principles of Food Service – catering for classes ranging from between 30 to 200 students. Two to three themes will be created under each of the above areas and the users can experience realistic scenarios in four respective departments of the Virtel. The framework of scenarios is set out in Table 1.

Table 1: *Framework of Scenarios*

Workplace 1	Front Desk
Themes:	1. Check in new arrivals 2. Check out guests 3. Handle complaints and enquiries at the front desk
Learning outcomes	1. Operational: Students will be able to carry out the main duties of the front desk including the stages of check-in and check-out progress
	2. Managerial: Students will be able to propose solutions to the problems in front office operations in the role of decision-maker
Workplace 2	Guestrooms
Themes:	1. Understanding cleaning equipment 2. Cleaning guestrooms 3. Safety and fire prevention
Learning outcomes	1. Operational: Students will be able to carry out the main duties of the housekeeping attendant to maintain a clean, safe and secure guestroom environment
	2. Managerial: Student will be able to allocate appropriate resources to housekeeping operations
Workplace 3	Food and Beverage Production Workstation
Themes:	1. Food Costing 2. Cooking principles and food preparation techniques
Learning outcomes	1. Operational: Students will be able to develop standard recipes and carry out some basic food production methods 2. Managerial: Students will be able to evaluate the food cost and make purchasing plans
Workplace 4	Restaurant
Themes:	1. Restaurant service skills and handling customer complaints 2. Salesmanship in foodservice
Learning outcomes	1. Operational: Students will be able to carry out the main duties and service skills in restaurant servicing operations 2. Managerial: Students will be able to allocate appropriate resources to restaurant operations

The following is an illustration of the flow of Virtel. Virtel is a 7-floor boutique-style hotel with four types of guestrooms: Deluxe suite, Junior suite, Superior and Economy. The floor plan (Fig. 3) and background hotel information provide clues for the users as they attempt subsequent dialogues and quests.
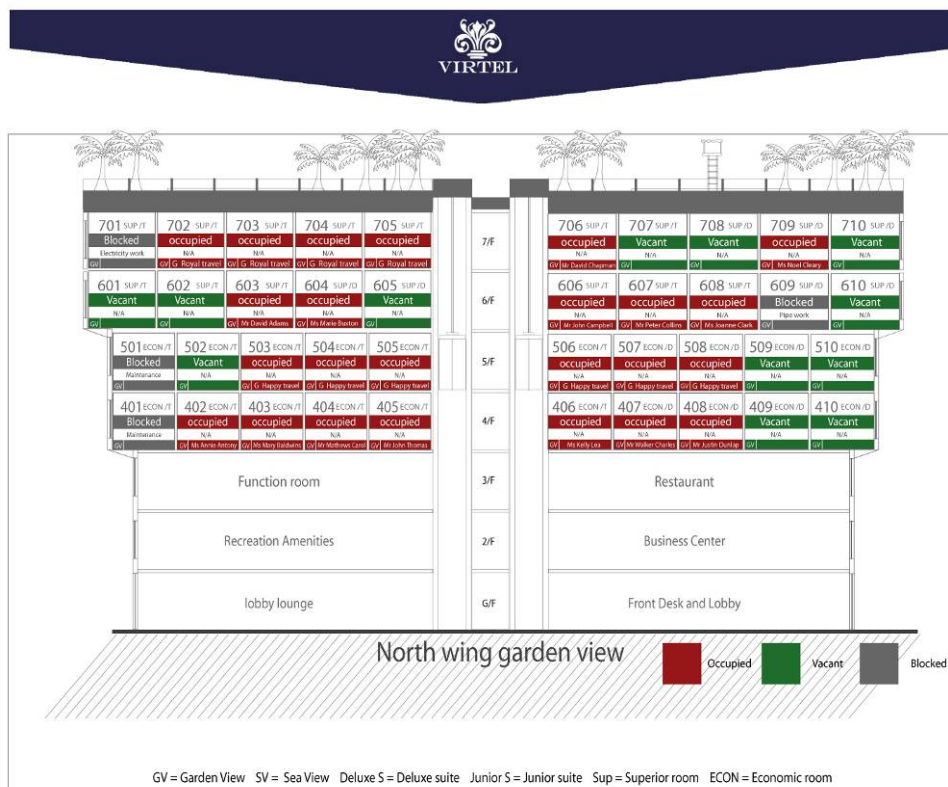

Figure 3: *Hotel Floor Plan*

Hotel Lobby (Fig. 4, 5) is the first workplace scene that users will encounter after starting the simulation. Here users will receive further instructions about the simulation and select which functional areas of the hotel they will enter to work.

Figure 4, 5: *Hotel Lobby*

Scenarios in the Front Office context take place at the hotel front desk (Fig. 6, 7).   The user acts as a front desk officer (avatar) providing services to the incoming guests.

Figure 6, 7: *Front Desk Workplace*

The interface for the front desk (Fig. 8) is comprised of four main components: 1) Workplace (virtual environment presented by 3-D animations); 2) Performance indicators (measurement for accuracy of responses/actions), 3) Action panel (panel for selection and submission of dialogic response or action), 4) Information switches (individual pages storing essential information and clues for users to comprehend the learning activities).

Figure 8: *Interface for Front Desk*

Dialogic responses (Fig. 9, 10) from the hotel guest are presented by dialogue box, facial expression and synthesized sound. The computer on the work-desk, on the other hand, provides instant feedback to the user in regard to the accuracy of choice of actions with respect to the given operation practices.
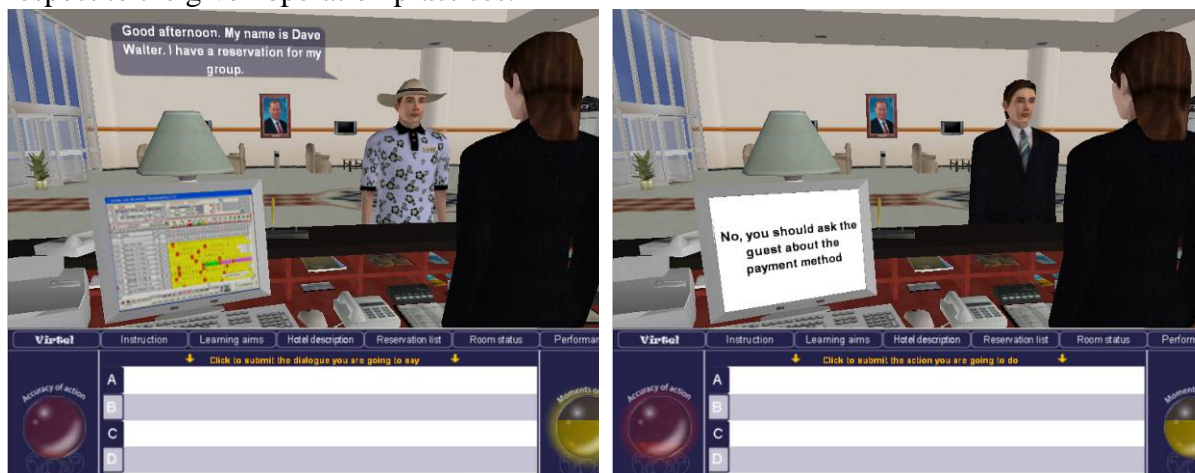
Figure 9, 10: *Responses*

A quest prompt (Fig. 11) appears during the dialogue requiring the user to provide appropriate answers by referring to the given information.

Figure 11: *Quest Prompt*

Scenarios in to the Housekeeping context take place in the guestrooms: 1. Economy room (Fig. 12); 2. Superior room (Fig. 13); 3. Junior suite (Fig. 14); 4. Deluxe suite (Fig. 15).
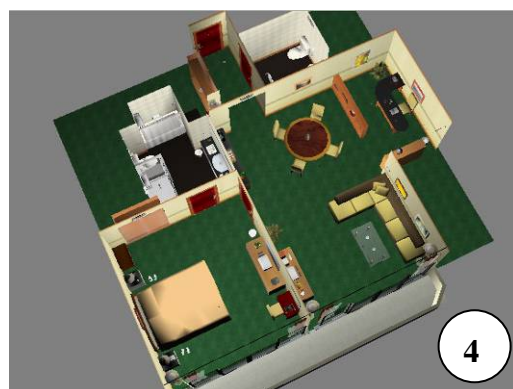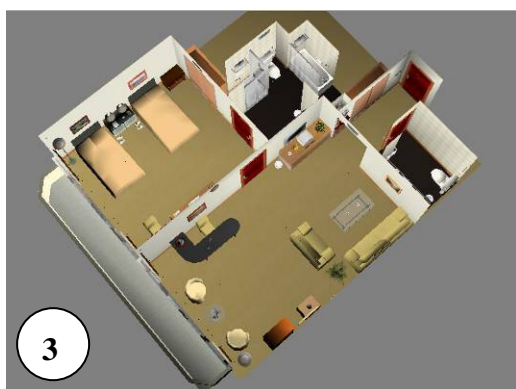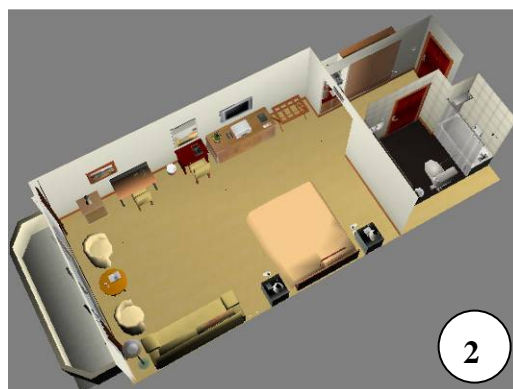

Figure 12, 13, 14, 15: *Housekeeping Workplace*

Housekeeping Quest 1 (Housekeeping tools and equipment, Fig. 16) is the first prerequisite quest before users can proceed to guestroom cleaning. This is a timed matching exercise for assessing user's knowledge of the names and application of the housekeeping tools and equipment, essential knowledge for this operation.

Figure 16: *Housekeeping Quest 1 (Housekeeping tools and equipment)*

In Housekeeping Quest 2 (Prioritize room assignment, Fi.g 17), by referring to the hotel policy and room status, users are required to rank the sequence of the room cleaning assignment.

Figure 17: *Housekeeping Quest 2 (Prioritize room assignment)*

Housekeeping Quest 3 (Selecting and loading the tool cart, Fig. 18) is the last prerequisite quest before users can proceed to guestroom cleaning (quest 4). Based on the hotel policy and room type showing on the room assignment sheet in quest 2, users are required to load appropriate quantity of guestroom supplies (i.e. linens) onto the housekeeping tool cart.

Figure 18: *Housekeeping Quest 3 (Loading materials to tool cart)*

The interface for Housekeeping Quest 4 (Room-Cleaning, Fig. 19) is comprised of eight components: 1) Workplace (virtual environment presented by 3-D animations); 2) Selectable items and actions (iconic display of items with which user can interact in respect of his/her present location); 3) Items in hands (display of tools and items that user is holding in hands) and room map (a minimized bird-eye view of the room); 4) Performance indicator (measurement of room-cleaning progress); 5) Hints (display of clues to the room-cleaning process. Users are allowed to disable/enable the hints throughout the quest); 6) Tool cart (a switch to the tool cart interface for loading/ejecting items in hands); 7) Perspective (providing three perspectives of view); 8) Information switches (individual pages storing essential information and clues for use to comprehend the learning activities).
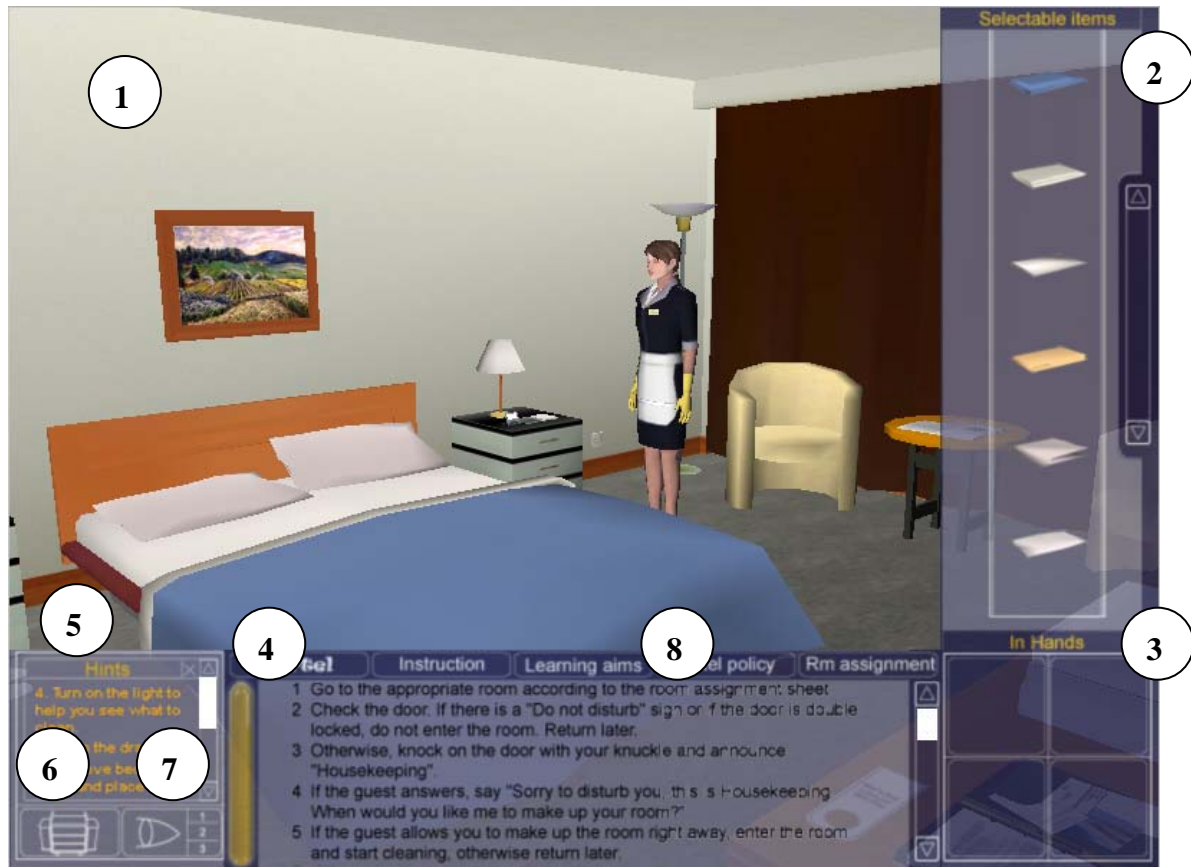
Figure 19: *Interface for Housekeeping Quest 4 (Guestroom cleaning)*

In Housekeeping Quest 4 (Guestroom cleaning, Fig. 20), based on the hotel policy and room assignment sheet, users are required to clean the guestroom by interacting with objects in the workplace and tool cart. The performance indicator shows the overall progress.

Figure 20: *Housekeeping Quest 4 (Guestroom cleaning)*

Users can gain additional points by finding bonus objects (Fig. 21) such as items left over by guests and damaged furniture.
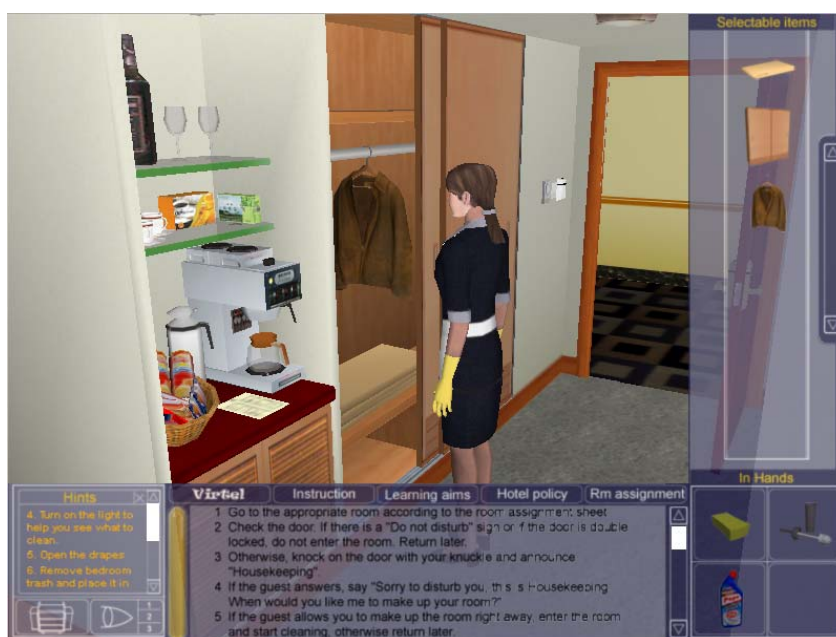

Figure 21: *Bonus Items*

Conclusion

There are other scenario-based learning materials available in the marketplace, however the unique strength of Virtel is that it provides the chance for students to visualise and interact with the environment at their preferred pace and choice of job role. One of the

pedagogical considerations of Virtel is that it is closely aligned with learning outcomes and assessment of performance. It is acknowledged that students may find the linear approach less enjoyable than a cyclical or open-ended approach, but the linear method is actually suitable for the kind of scenarios the students will experience, where they need to follow through in a systematic way, using agreed procedures to satisfy customer and manager expectations. There is a degree of ambiguity in the scenarios in that interpersonal skills need to be exercised in order to deal with people problems and unexpected situations. Here the student is given a range of options or asked to find a solution based upon information provided in various forms or based on previous scenarios. The simulation overall should enable the student to gain confidence in dealing with unfamiliar situations, as well as be able to follow operational procedures accurately and confidently.

Teachers response to the Virtel has been generally very positive, but with some concerns and reservations. Firstly, most academics were glad to have an alternative, interactive tool to help teach some of the scenarios. We chose the scenarios based upon teaching methods used in the classroom such as role play or classroom simulation exercises. These were the obvious areas to replicate in designing an online simulation tool. Teachers recognized that skills needed for work placements were hard to learn in the traditional classroom and therefore were keen to help develop the tools needed. There was some concern about the workload required to generate the contents for the simulations, and two teachers pulled out of the project once they realized the research and work needed. Others joined the project because they could see the benefits to their subject and to their students in learning through online simulations. One teacher questioned the 'basic' skills being taught, and whether we should focus on high-level thinking and learning instead. This was countered by others who recognized that core skills were actually needed by students going into their placements. There was also interest from local hotels in using some of the scenarios in their own training for new front line staff in core operations.

Limitations of the simulation and further development

We recognize that Virtel has many shortcomings, as it was produced with a limited budget and a short time frame. We had planned to produce more scenarios across a range of other courses but did not have time to do so. The creation of artifacts, avitars and 3-D models took much more time than expected. The recruitment, development and training of the team, the mastery of the key software (Virtools) and the difficulty of acquiring the technical information from academic staff in a form suitable for programming was another challenge. The instructional design was also time-consuming and painstaking, as every situation and variant had to be considered and catered for. Some of the scenarios were chosen because they were challenging to teach or conceptually difficult to design, such as some of the food production and planning scenarios. These took more time and effort to design and complete than originally planned. We acknowledge that the Virtel simulation is just one of a number of

different learning strategies that can be used to prepare students for their work placement and provide them with new skills. It was envisaged that a visually stimulating, interactive learning experience would help students to gain an understanding and insight into a hotel environment and give them more confidence when they faced the same scenarios in real life. They would also be able to practice the simulations in their own time at their own pace.

Future development of this model could extend to other areas of the hospitality industry, for example supervisory skills, specialist roles and design and planning of facilities. We may use Virtel in its present form as entry level experience, and develop roles within the environment for supervisors, restaurant managers and others to interact with inexperienced students (acting as front line staff) to provide more of a 'connected' learning experience.

References

Annetta, L.A, Murray, M.R, Laird, S.G, Bohr, S.C, Park, J.C. (2006) *Serious Games: Incorporating Video Games in the Classroom.* Educause Quarterly, No 3, 2006

Aldrich, C. (2004) *Simulations and the future of learning*, San Francisco, Pfeiffer

Amory, A. Naicker, K. Vincent, J. Adams C. (1999) *The use of computer games as an educational tool: identification of appropriate game types and elements*, British Journal of Educational Technology v30 no4 p311-321

Hagel, H and Armstrong, A. (1997) *Net Gain: Expanding Markets through Virtual Communities*. Boston, Mass. Business School Press

Hong Kong Tourism Board, Hong Kong (2006) *Tourism Performance,* Retrieved on 19.9.06 from http://www.tourism.gov.hk/english/statistics/statistics_perform.html

Lepper, M.R, Cordova D.I. (1992). *A desire to be taught: Instructional consequences of intrinsic motivation,* Motivation and Emotion v16 no3 p187-208

Lundy, J., Logan, D., & Harris, K. (2002). *Simulation may be the e-learning "killer app".* Retrieved 9 September 2006, from: http://techupdate.zdnet.com/techupdate/stories/main/0,14179,2878649,00.html

Musslewhite, C. (2003) *Simulation Classification System*, Discovery Learning, Published by Learning Circuits. Retrieved on 21.9.06 from: http://www.learningcircuits.org/2003/aug2003/musselwhite.htm

Oblinger, D. (2003) *Boomers, Gen-Xers, and Millennials: Understanding the 'New Students,'* EDUCAUSE Review, vol. 38, no. 4 (July/August 2003), pp. 37–47, Retrieved on 20.9.06 from http://www.educause.edu/apps/er/erm03/erm034.asp.

Prensky, M. (2002) *Why NOT Simulation?* www.marcprensky.com. Retrieved on 21.9.06 fromhttp://www.marcprensky.com/writing/Prensky%20-%20Why%20NOT%20Simulation.pdf

Prensky, M, (2001) *Digital Natives, Digital Immigrants.* On the Horizon (NCB University Press, Vol. 9 No. 5, October 2001) Retrieved on 23.9.06 from http://www.marcprensky.com/writing/Prensky%20-%20Digital%20Natives,%20Digital%20Immigrants%20-%20Part1.pdf

Schank, R. (1997) *Virtual Learning. A Revolutionary Approach to Building a Highly Skilled Workforce.* McGraw-Hill, New York

Zemsky, R and Massey, W.E. (2004) *Why the E-Learning Boom went Bust*, Chronicle of Higher Education, Vol. 50, 9 July 2004, p B6. Retrieved on 20.9.06 from: http://education.unlv.edu/Educational_Leadership/higheredadmin/Admissions-Article.pdf#search=%22Why%20the%20E-Learning%20Boom%20went%20Bust%22