



## Information and Communication Technology–Enabled Innovation: Application of the Virtual Field Trip in Hospitality Education

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### ABSTRACT

This research examines students' experience with an innovative virtual field trip of hotels. Students taking a Food and Beverage Management course participated in this research. The VFT included aspects of managing the food and beverage function of hotels and supplemented the delivery of face-to-face teaching to form a blended learning experience. Personal interviews with 18 students in two stages were conducted to establish their expectations and perceptions of a VFT experience. The level of innovation in this research was evaluated using a mapping framework, designed to gauge the veracity of information and communication technology–enabled innovation for learning. The results revealed that students' learning experience was enhanced by the existence of the VFT environment. Students emerged to be active rather than passive learners, and the VFT environment helped in advancing their fundamental business graduate skills (i.e., problem solving), which is undeniably essential in preparing the hotel leaders of tomorrow.

### KEYWORDS

Hospitality education;  
information and  
communication technology;  
mapping framework; virtual  
field trip

Today, in all walks of life, the application of technology is a dominating feature that will constantly grow into more sophisticated forms in the future (Ferrari, Cachia, & Punie, 2009). In the context of education in particular, academics are witnessing technology that is supporting faster means of communication, easy access to knowledge bases, higher interactivity, effective collaboration among stakeholders, and the use of multimodal forms of teaching delivery (Bates & Poole, 2003; Broad, 2014; Salmon, 2012; Sigala, 2013). It is believed that digital innovations may dramatically change the world of tourism in the future, and there is a necessity to develop the digital competence of students by embedding curricula supporting interdisciplinary applications in tourism education (Morellato, 2014). Furthermore, digital technology provides rich opportunities beyond the bricks and mortar of the classroom, playing a critical role in contemporary learning (Lock, 2015).

To keep pace with an ongoing reduction in government funding and rising competition, universities in Australia are being forced to move toward an economical teaching model (e.g., teaching a large number of students in lecture theaters). Although this mode of course delivery is economical, it is far from effective in engaging and stimulating students' learning experiences (Prensky, 2001a). Furthermore, this economical

teaching model has virtually eliminated practical experience from the curriculum, although practical experience is preferred by the hospitality industry (Lashley, 2007). Moreover, time limitations (i.e., due to flexible programs of study and students' progression) and an increase in student enrolments have reduced academics' ability to offer students meaningful insight into the real functioning of hotels through physically participating in the field trip experience. This situation has inspired the development and implementation of the virtual field trip (VFT) as an information and communication technology (ICT) innovation for learning and overcome the logistics of tight timelines and taking large cohorts of students on a physical field trip to hotels.

Research shows that the incorporation of a physical field trip (at a functioning organization) on which a group of students can observe a real-life phenomenon helps merge theory and practice (Bottino, 2010; Conole, 2010). Lange (2002) adapted the works of Hogan and Pressley (1997), arguing that effective instructional scaffolding can be achieved through field trips. Allowing scaffolding of the major concepts can help make the learning material interesting, informative, and interactive, empowering students to control their own learning (The Organization for Economic Cooperation and Development/Centre for Educational Research and Innovation, 2010a). Greene,

Kisida, and Bowen (2014) highlighted the fact that successful field trips require methodical planning by academics as well as strong commitment on the part of students to engage with the experience. For instance, an academic has to ensure the authenticity of the site (the suitability of the destination and its operations' compatibility with the course material) and the activities during the trip (presentations, talks, tours, worksheets, and demonstrations) and after the trip (discussions and reflections). The VFT allows the course material to be linked with the realism, which aids in the foundation of a long-lasting impression for students as they witness the actual functioning of hotel operations and management practices.

This article presents a VFT designed to develop authentic learning grounded in the curriculum and experienced through technology and helps to address the removal of practical laboratories (i.e., training kitchen and restaurant) and the logistics of including physical field trips in the hospitality education curriculum. The VFT also answers the call to produce digital materials that effectively exploit the potential of software to deliver educational outcomes and can enhance tourism students' learning experiences (Sigala, 2002). According to constructivists today, students build internal and personal interpretations of new knowledge based on their present understanding of knowledge (Khine & Fisher, 2003). Furthermore, this process and evidence can be used as a template for other courses and programs of study within higher education institutions. Initially we present the context of the VFT study and the pedagogical framework supporting the innovation, and the following literature review examines various theories related to digital learning, e-learning, and innovation in education. The next section introduces the multidimensional mapping framework applied in this study and is followed by the methodology, findings, and discussion.

### The Context of the VFT

Educators from a public university in Australia were engaged in a long-term strategy to develop and implement a VFT of five-star hotels' food and beverage operations in a second-year-level undergraduate core course. The VFT is a guided exploration of a Web site that organizes a collection of prescreened, thematically based Web pages into a structured online learning experience as a viable alternative to physical field trips. The VFT provides students with an asynchronous tour of the operational functioning of two five-star hotels, thus providing

an authentic learning experience. In a mixture of experiential and problem-based learning approaches, students were required to work together in small groups to build up principles from the VFT experience and develop a detailed business plan for an additional food and beverage outlet in one of the two hotels. The provision of the design and layout of production and service areas, various processes, and management practices provided students with rigor and enrichment of understanding. More specifically, the VFT includes video clips of interviews with key managers, a gallery of images from the food and production areas of hotels, restaurant and kitchen floor plans, menus and other supporting documents.

Students were briefed on the use of the VFT and guided to systematically access information and extrapolate the required information to their food and beverage business plan assessment. The task required students to conduct research using the VFT, to share information, and to engage in critical thinking while working in small self-selected groups. Students made decisions, solved problems, and communicated their results through their own work. It is believed that such collaborative teaching and learning processes maximize high-quality learning outcomes for students (Huang, Blackman, Chang, Backman, & McGuire, 2013). These requirements result in students' intentional engagement in knowledge building through an exploration of the levels of information in the VFT and encourage an inquiry-driven knowledge construction approach to exceed their expectations. Thus, the VFT places students in an active role as they critically review the relationships between theories and the real-life scenarios and then apply that knowledge in their assessment tasks.

The advantages of the VFT are that, first, it blends both face-to-face learning and online learning experiences and facilitates deeper learning of the course content. This deeper learning is a value-added component to traditional teaching models so that both methods are congruent with intended favorable educational outcomes. Second, the VFT allows students to access the software at a time and place of their convenience so that they can learn at their own pace and time and in a space of their choice in a flexible manner (Staker & Horn, 2012). Third, the VFT makes the field trip experience available to a greater number of students without sacrificing the quality of their learning experience. Whereas some technologies in education lack social contact, in this situation students worked in groups to complete a major project as well as solve case studies. This was interspersed with online activities and classroom activities that encouraged blended

learning. Chou and Chou (2011, p. 464) described blended learning as an “instructional system that combines multiple learning delivery methods.” VFT combines face-to-face classroom activities with synchronous online learning.

The students of today have different learning styles, and, therefore, academics are responsible for developing suitable strategies to promote student engagement along with adequately preparing students for the knowledge economy (Powell & Snellman, 2004). It is believed that ICT can enhance the capabilities and cognitive processes of users (Sigala, 2013). Teaching pedagogy is the subject that focuses on the theory and practical aspects of education; in other words, it allows academics to adopt the most effective means of transferring knowledge to students. The constructivist views those students build internal and personal interpretations of new knowledge based on their prior and present understanding of knowledge (Khine & Fisher, 2003). Constructivist-based learning principles allow students the opportunity to construct knowledge responses to assessment criteria (Russell & Schneiderheinze, 2005), thus viewing learning as an active contextualized process of knowledge construction.

This project trialed and evaluated the VFT as a tool for developing student learning. Unless academics carefully elicit students' expectations and perceptions of a practical orientation course (food and beverage management) taught in a theoretical manner, they will not fully understand the effectiveness of students' learning experience. Therefore, the main purpose of this research was to examine students' experience of a VFT of five-star hotels' food and beverage operations. This article relates students' perceptions of how they engaged with the digitally stored information and how satisfied they were with this learning environment. In our research we evaluated the veracity of an innovative concept of a VFT tool using Kampylis et al.'s (2012) mapping framework of five dimensions. This framework was developed for the European Commission's Institute for Prospective Technological Studies and was designed to classify ICT-enabled innovation for learning as an initiative of the Europe 2020 strategy.

## Literature Review

Today's employees have to demonstrate high levels of creativity, the ability to synthesize information, effective communication, and critical thinking. “Critical thinking is the ability to evaluate information for credibility and relevance and to apply it to create new knowledge within a disciplinary context” (Artello, 2014, p. 170). The Internet generation has confidence with instantaneous access to information and spends a large amount of time

interacting with digital devices, demonstrating technological fluency and proficiency (Morellato, 2014). Digital literacy includes the ability to explore new technological situations with flexibility and to select and critically evaluate information and data to solve problems and build collaborative knowledge. Continued exposure to digital technology, such as computer games and the use of social media, has heightened the millennial generation's ability to respond faster to stimuli and develop their intellectual skills (Prensky, 2001b). This generation of students is labeled *digital natives*, having been born and spent their entire lives interacting with technology, using mobile devices to communicate and search for information (Prensky, 2001a). More recently, digital natives have access to smartphone technology that combines telephones and personal computers in one, offering a wide range of applications. A result of current students' digital experiences is that they crave interactivity in an electronic medium of e-learning.

*E-learning* can be defined as the use of new information technologies to improve the quality of learning by facilitating access to resources through remote exchanges and collaboration (Cantoni, Kalbaska, & Inversini, 2009). In e-learning students have the ability to respond fast to stimuli at click-speed pace. As today's students are immersed in and fully conversant with information technology, their intrinsic involvement means that they have the capacity to merge the traditional pedagogical function of the classroom with aspects of instrumental technology. Indeed, in digital delivery students have the right to articulate the ways in which they work (Sigala, 2002), and this project design emphasizes the need to listen to student voices. Using technology to implement a VFT demonstrates innovation and encourages development of higher level knowledge embedded in activity through the learning abilities of students.

The active use of VFT innovations allows students to control learning through sequencing and accessing learning opportunities to satisfy their own needs. According to scholars, for example Hannafin and Land (2000) and Keengwe, Onchwari, and Onchwari (2009), the use of technology such as the VFT can provide academics with an opportunity to switch teacher-centered learning to student-centered learning, which is considered to be effective for improving students' engagement and motivation to do well. Although there is evidence of the application of technology in the form of VFT in teaching disciplines, such as history, geography, anthropology, farming, and the like, similar evidence in the teaching of tourism and hospitality management is missing.

However, some interest in the application of the VFT in hospitality has begun to emerge. Students engaged with a

VFT found it to be a useful learning resource, as it supplements lectures and literature through textbooks and scholarly journals (Patiar, Ma, Kensbock, & Cox, 2017). Thus, VFT teaching strategies promote learning by doing, problem solving, and developing creativity (Law, Yuen, & Fox, 2011). Developments in technology-rich learning environments are a result of the growing computer literacy of Generation Y, and the best and most instructionally sound way technology can be used is to provide students with real authentic experiences (Khine & Fisher, 2003).

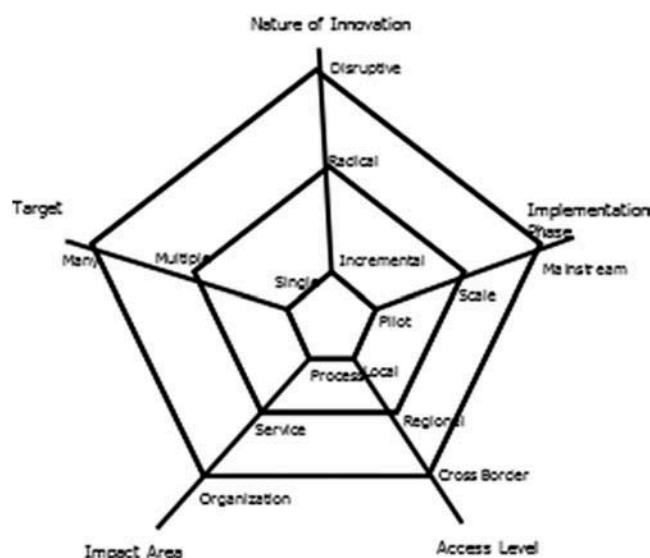
Similarly, innovative teaching is key to education in today's information technology-abundant society (Bocconi, Kamylyis, & Punie, 2013). The Organization for Economic Cooperation and Development / Centre for Educational Research and Innovation (2010b, p. 14) defined *innovation* as "any dynamic change intended to add value to the educational process and resulting in measurable outcomes." Researchers describe innovation in teaching as the implementation of new ideas or concepts into an existing product or process (Chou & Chou, 2011), whereas in the context of education it is perceived as pedagogy that is new and produces distinct changes in the way education is delivered. Innovation in education provides students with alternative tools and means of solving a variety of problems in ways not possible without the innovation (Russell & Schneiderheinze, 2005). Innovation is a cumulative process needed to improve education and teaching to effectively foster students' creative potential and cover the needs of 21st-century learners (Bocconi et al., 2013). Although innovation in education is now a top priority all over the world, it is believed that few innovative projects survive beyond the early adopter stage to become fully embedded in educational practice (Bocconi et al., 2013).

The challenge, however, is to evaluate educational innovation (Lockwood, 2001). Capturing the complex nature of education innovation through classification and typologies is reflected in the efforts of several researchers (Cooper, 1998; Law et al., 2011). They claim that the landscape of higher education is rapidly changing through technological development and that innovation fosters creative thinking and meaning making, placing learners at the center of their own learning process. The innovation of a VFT fosters mental imagery as the creation of an experience that resembles actually perceiving the object, and this visual stimulus activates brain imagery, which enhances learning and memory creation (She & Fisher, 2003). Furthermore, research shows that students who are actively engaged in computer-based activities do better than students with traditional instruction (She & Fisher, 2003). As tourism is an intensive information domain of gathering and

processing information, ICT has the potential to have a major impact on the education process in transforming curricula, learning materials, and instructional practices, offering tourism students advantages through greater flexibility in context and the ability to think critically and solve problems (Sigala, 2002).

## Multidimensional Mapping Framework

Kamylyis et al. (2012) proposed a multidimensional mapping framework to gauge the veracity of information technology-enabled innovation for learning within large groups. Educational innovation enables experiences that students can then transfer to real-life settings while also meeting the needs of 21st-century learners. Our study resonated with the key areas identified within Kamylyis et al.'s framework; although they applied it at the macrolevel, our study applied the framework to the microventure of a VFT. No other tool for evaluating innovation in education or e-learning was found. Rather than develop a different nomenclature, we used Kamylyis et al.'s terms in the framing of our analysis. Kamylyis et al.'s mapping framework comprises five dimensions designed to measure the impact, reach, and reliability of an ICT-generated innovative concept. These five dimensions support our understanding of the nature of ICT-enabled innovation for learning and offer a map of the ICT initiatives' innovativeness. See Figure 1 for the five dimensions of ICT. This framework offers the following dimensions:



**Figure 1.** A mapping framework of information and communication technology-enabled innovation for learning (Kamylyis et al., 2012).



- (1) Nature of innovation: Incremental, radical, or disruptive, capturing the level of organizational and pedagogical change (Leadbeater & Wong, 2010; The Organization for Economic Cooperation and Development/Centre for Educational Research and Innovation, 2009)
- (2) Implementation phase: Pilot, scale, or mainstreaming, describing the current stage of development in increasing uptake scale (The Organization for Economic Cooperation and Development/Centre for Educational Research and Innovation, 2010a)
- (3) Access level: Local, regional, or cross-border, capturing the geographical coverage (The Organization for Economic Cooperation and Development/Centre for Educational Research and Innovation, 2010b)
- (4) Impact area: Process, service, or organization, referring to the extent of innovation (Robinson, 2001)
- (5) Target: Single actors, multiple actors, or a wide range of actors, delineating the target group (Cairney, 2000)

The five dimensions are conceptualized as a spider's web with interconnections highlighting the complexity of effort required to improve education innovation (Bocconi et al., 2013). This multidimensional framework was applied to improve understanding of the effectiveness of implementing the existing VFT of hotels' food and beverage operation. Features were analyzed against the different trajectories of the mapping framework.

Our use of the innovation for learning framework is supported by students' perceptions of the VFT in relation to innovation. In considering information technology as a social phenomenon that fundamentally influences student performance (Westera, 2005), the VFT challenges the conservatism of conventional teaching. The VFT offers a way to engage and develop students' ability in a more effective and efficient fashion than conventional teaching methods. Innovation through the VFT learning process complements the traditional face-to-face learning processes. The following two research questions were posed:

- (1) How innovative is the VFT of hotels' food and beverage operation?
- (2) How does the VFT of hotels' food and beverage operation contribute to students' learning experience in a food and beverage management course?

## Methodology

The effectiveness of the VFT was evaluated using qualitative methods. Students' expectations and perception of the use of the VFT as a part of a core course were gathered through face-to-face in-depth interviews to obtain a deeper and more nuanced understanding of their learning experiences. The target population was second-year undergraduate students enrolled in a food and beverage management course, core within the Bachelor of Hotel Management at a leading university in Australia. The course had approximately 180 students in total from diverse domestic and international backgrounds. The final 18 students who were interviewed represented a fairly even spread based on their gender, grade point average, and status (domestic or international). Precourse expectations-related interviews were conducted with 18 students (10 females and eight males) prior to their exposure to the VFT and the course to gauge exactly what they would like to get out of food and beverage courses as well as a VFT tool. Furthermore, postcourse experience interviews were conducted with the same 18 students (10 females and eight males) at the end of the semester after students had had the opportunity to engage with the VFT and attempt various pieces of assessment during the course delivery to ascertain their reflections on their experiences with the VFT tool. Participating students were recruited on a purposive foundation (as students in the course were the experts of their experiences) and on a voluntary basis. The sample size was informatively representative as saturation of concepts was achieved (Morse, 2000; Sandelowski, 1995).

As discussed above, participant sampling ensured that a heterogeneous sample was selected to encapsulate a broad assortment of viewpoints involving the issues of utmost interest. Small incentives of a movie ticket for the initial interviews at the start of the semester and a \$10 gift voucher for the postcourse interviews toward the end of the semester were offered. These incentives were designed to encourage and thank students for their participation. Participants were provided with an information sheet that informed them of the purpose of the research and assured them of their anonymity. Participants were then asked to sign a consent form. This study conformed to the university's research ethics guidelines. Open-ended questions were posed during both interview sessions to allow students to reflect and elaborate on their expectations and experiences. See Table 1 outlining sample questions. A researcher, in a private office space, conducted both sets of face-to-face interviews at two different points in time during 2014. The interviews were digitally recorded and

**Table 1.** Pre- and postcourse interview questions to gauge students' expectations and perceptions.

Panel A
Precourse interview
Question 1: What do you expect to get out of the food and beverage management course this semester?
Question 2: What are your expectations of the VFT Web site in terms of the content it should provide?
Question 3: What are your expectations of the VFT Web site in terms of the layout and ease of its navigation?
Panel B
Postcourse interview
Question 1: What is your overall impression of the VFT Web site?
Question 2: In what way was the VFT innovative?
Question 3: How was the content of VFT relevant to this course's assessment?
Question 4: How did the VFT help you improve your understanding of hotel food and beverage operations?

Note: VFT = virtual field trip.

transcribed verbatim. Each interview lasted between 10 and 20 min.

Two levels of coding helped us analyze the empirical material. A line-by-line analysis identifying key words usually in a gerund (verb or "doing") format was followed by a second level of coding that subsumed the codes into a higher order concept reflecting the main themes identified by students. These themes were then aligned with the five dimensions of the innovation in learning mapping framework described above and are demonstrated here by verbatim quotes from the students to give voice, thus privileging the students as the experts in the learning process. The next section presents the findings for the students' expectations and experiences. Excerpts from the interviews are provided and distinguished with pseudonyms. A discussion of the pre- and postcourse expectations and experiences is then provided.

## Findings

Students were excited to learn and collaborate over the VFT. Students commented on how the VFT offered an insight into how hotels are managed and provided in-depth details of the food and beverage department's functioning. One student was delighted with the wealth of information provided and commented:

I loved how there was information on all the different aspects of the course content including interior design and layout of restaurant and bar, signage and information related to developing the menus and wine lists. There was an endless amount of information on almost every question you could have about the [X] Resort, which made the first part of our assessment much easier to complete.

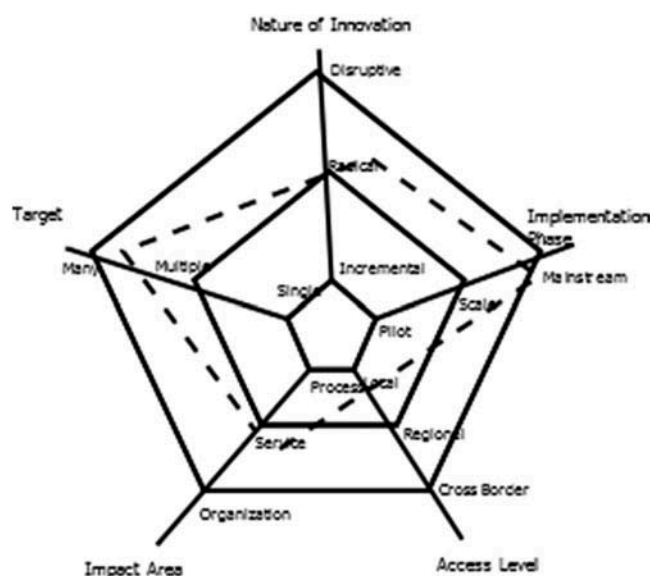
Use of a VFT tool in an undergraduate food and beverage management course offers a profound new way to use ICT-enabled innovation for learning within

the university context. An application of Kampylis et al.'s (2012) multidimensional mapping framework shows that the VFT was a highly innovative blended learning pedagogy developed and implemented in the teaching of a hotel management program (see Figure 2 for details and further elaboration).

In regard to the nature of innovation in VFT, it is radical change, in that it is a new process yet still merged with existing pedagogical practices. The implementation phase is scale in that the VFT is still in the development stages. The access level is still local, with plans to implement at regional- and national-level institutions next and cross-border institutions in the near future. The impact area is new, and the target is a wide range of actors. As shown in Figure 2 the VFT was measured and found to be an innovative change to teaching methods. Although the mapping framework has been applied to the VFT, an in-depth analysis is necessary for more evidence-based mapping, and this is related next.

## Nature of Innovation

The VFT started as a radical innovation, and efforts are under way to expand the content and services, offering students unique opportunities to explore several hotels' food and beverage operations spread around geographic locations to capture different cultures, management practices, and international trends. Students had high expectations for the food and beverage management course innovation and believed that they would learn "everything" related to the management of food and beverage production and service and being able to



**Figure 2.** A mapping framework of virtual field trip innovation. Adapted from Kampylis et al. (2012).

apply theory to life situations. As Noel stated, “Just the whole operations of a food and beverage, how it’s made from both back of house and front of house, going from the kitchen, or even purchasing inventory and stock control all the way thorough to postevaluation.”

Student expectations of the VFT Web site in terms of content, layout, and ease of navigation were often described as “detailed” with videos and live animation. It was believed that the VFT would provide students with a full operational understanding, as Karla noted: “I think it’d be good if it went into quite a lot of detail which I think it will.”

There was also an expectation that other departments would be overviewed, as Millie explained: “I’d expect to see the start of the hotel, like the entrance into the hotel and then virtualized into the workings of restaurants, bars and how they set the table up and how the kitchen works.”

Apart from the general overview of the key areas of hotels’ food and beverage operations there were expectations that several images would be there and provide detailed explanations with active links to other departments within the hotels and some external sites. The post-VFT experience revealed that all students found the Web site interesting and helpful and enjoyed the learning experience through the VFT. The students’ placement of high value on the VFT was reflected in common use of the word *cool*, and the VFT was considered to be innovative, providing plenty of information and practical knowledge. Karen stated, “I thought it was pretty innovative. I hadn’t had anything like it at my uni back home before so it was interesting to see the hotel’s food and beverage operation through that kind of medium.”

The opportunity to compare two different hotel properties was considered to add to the students’ appreciation of hotels’ food and beverage operations. Without exception students found the concept of the VFT innovative, as demonstrated by Julie: “I’ve been at uni for 2 years so far and I haven’t seen anything like this before in other courses I studied.”

Students made links between the theoretical teaching material they received through formal lectures and additional practical information they accessed via the Web site that helped in bridging the gap between theory and practice, more specifically “to workplace areas.” These included food and beverage operations, foodservice area planning and design, food and beverage control, and purchasing. Sarah stated, “The VFT allows us to build on theories and knowledge provided through the course to a ‘real-life’ situation.”

Many students stated that the VFT was time saving, as they did not have to physically visit the hotel sites.

Comments were also made that the level of detail provided via the VFT perhaps would not have been available through a field visit: “I thoroughly enjoyed the notion that you can step inside a hotel just with the click of a mouse.”

The VFT allowed students to explore the hotel property sites at their own pace and revisit them if necessary to grasp the concepts fully. This encouraged deeper learning of the intricacies of managing a complex food and beverage operation in a large five-star international standard hotel.

Most students found that the VFT Web site functioned well and was “user friendly and informative.” Students found the VFT visually appealing and said that it was easy to become familiar with its functionality. The information contained in the VFT was easily accessible from anywhere via an Internet connection using personal computer or smartphone-like devices. Through the interviews with key managers in hotels and visual aids of certain aspects of food and beverage operation students were able to access areas of the hotel that would only have been accessible had students been physically employed there. Students’ comments in relation to the interactivity and design of the VFT sites were positive. Students were able to click on the links and navigate through the levels to the food and beverage operation of the entire hotels. This functionality and access to a real-world situation gave students the opportunity to apply their acquired theoretical knowledge to attempt their assessment, including a major project of designing a hotel restaurant, which was supported by lectures, workshops, and seminars.

### Implementation Phase

Now in its third year, the VFT involves all students in the Food and Beverage Management course (approximately 250) on two different campuses, including two lecturers and three tutors (assistant lecturers). Wider adoption within other courses and the involvement of other institutions will move the current scale to mainstreaming in the near future. It is further envisaged that additional hotels located in different cities of Australia and overseas will add to the existing two hotels currently featured in the VFT. This will internationalize the curriculum, offering students full access to a global spectrum of VFT experiences.

### Access Level

The VFT is currently offered at the local level, within one university on two campuses; however, new

developments mean that the VFT will be offered to cross-border institutions, particularly in the Asia Pacific, the United Kingdom, and the United States. Overwhelmingly, the material covered in the VFT was considered to greatly assist students in understanding critical aspects of food and beverage production and service operations. Maya's statement reveals the opinions held by students: "I didn't really think about it before but it's quite interesting and I'm always coming out of the class very hungry, and like to talk about good restaurants."

The VFT revealed aspects of food and beverage management of which students were unaware, particularly the importance of the menu and restaurant design and development. Tom's belief mirrored the reflections of students: "It was good because it provided a great practical side to the course that we wouldn't normally have in a course, particularly for the main assignment of a hotel's restaurant design."

This was reinforced by Sarah ("It was good to have a lot of support for our major project") and further by Rebecca:

It's a very good learning tool for us, because we can explore the front and back of house areas a lot and also where we can actually listen to the recordings of the chef and managers actually giving us a lot of information that we don't know.

The interviews with staff working in the hospitality industry allowed students to gain insight into the roles of key managers of hotels. This executive team, their views and practice of management skills, and stories of their success at the participating hotels can be seen as role models. For visual learners the comparison of images and videos of the restaurants and bars improved observation skills and allowed students to make comparisons between the two hotels, offering an appreciation for the development of atmosphere within the hotel food and beverage context.

### Impact Area

The VFT is currently offered at one course level at the Department of Tourism and Hotel level and may in the future impact on the entire degree program and other degree programs at the university level. Sangrà and Gonzállez-Sanmamed (2010) contended that ICT improves the quality of learning at the graduate level. Open and experimental learning methods enable improvement in the baseline knowledge students possess and improve on this information by enhancing curriculum design and implementation. Students found that the floor plans of various areas such as

restaurants, bars, and kitchen were extremely useful, allowing them to apply principles in planning their restaurant project and then see how the final product would look. The deeper understanding provided by the VFT through the provision of the floor plans of the two hotels' several restaurants facilitated students' conceptualization and understanding of the importance of location, both within the hotel and regarding the layout functionality of a well-designed restaurant and kitchen. Through the VFT, students were able to access details of "behind-the-scenes" operations, including the standard operating procedures of managing a large complex operation. In particular, the VFT assisted students by broadening their knowledge of food and beverage operations so that they could effectively apply this knowledge in developing their own restaurant concept.

### Target

The VFT's current target group is tertiary students at two different campuses. However, plans are to offer students at multiple international campuses access to VFT. In relation to their opinions of other expectations that were not covered in the previous questions, many students stated that they expected practical and theoretical understanding and extra assistance from the teaching team to assist them in understanding the whole process of food and beverage operations as well as the development of group work dynamics. This learning was reinforced when students were required to work in a group to develop a hotel restaurant from concept to operation, as Sue described: "I think I learnt a lot about how to work in groups."

Three students of the 18 participants were not so effusive. One felt that the information was "underwhelming," and the remaining two commented that the descriptions provided in the VFT were vague.

### Discussion

The reflective responses of students' experiences depicted in this article are confirmation of the innovative learning practice offered by the VFT. Innovation is believed to involve intentional changes with deliberate implementation to solve problems through improvement in process or product and involves a dynamic social process of complex interactions in a context that influences its development and diffusion (Bocconi et al., 2013). The VFT provides students with a rich learning opportunity, improving their satisfaction and increasing outcomes. Although students were satisfied with the overall performance of the VFT, there are areas for further improvement, particularly related to



the technical and interactive aspects of the Web site. Our study contributes to the literature by distinguishing a software innovation in an electronic medium to facilitate e-learning among hotel management students enrolled in one of the universities in Australia. The VFT stimulates students through sequencing and unpacking their learning tasks, which increase in complexity as they progress through the course content and assessments. The VFT offers symbolic meaning through restricted access to students enrolled in the food and beverage management course core within the hotel management curriculum. Westera (2005) identified four modes of involvement with technology: sensory, conceptual, operational, and material involvement. Sensory involvement is developed through tangible engagement with the hardware and stimulus of the software content and auditory composition. Through the VFT students are able to effectively engage in exercises focusing on discipline and developing their perseverance skills while reflecting on their progress through the self-paced learning exercises. This means, for example, that students are free to adapt their personal learning style to develop a deeper understanding of the course material and enhance their problem-solving and decision-making skills. Thus, supporting Prensky's (2001a, 2001b) lines of argument, digital natives are more comfortable with technology maximizing their capacity for a positive learning experience.

Students were motivated to problem-solve and engage with the VFT material far more than anticipated. The VFT is a paradigm-breaking tool offering advantages over traditional communication media in aspects such as reach, low cost, richness, speed of communication, and interactivity. The VFT contains much more (visual multimedia) information than traditional paper-based learning, and it is not constrained by the boundaries of the screen (as books are limited in the size of paper). The VFT can be used in education, and its educational impacts can be measured in terms of two learning outcomes: information transfer through visual capabilities and maximizing the cognitive load of the learning processes (Morellato, 2014).

We found measurable outcomes of student satisfaction and improved educational performance as a result of using the VFT. The most innovative classrooms are those in which students use technology to support their learning and connect with the broader world (Kumar, Kumar, Srikrishna, & Govindaluri, 2014; Violante & Vezzetti, 2015). Assessment is generated through authentic evidence of targeted process outcomes in the learning process and as a result helps to merge and build a solid bridge between theory and practice (Bottino, 2010; Conole, 2010). The VFT is an excellent

example of a blended learning initiative that is viewed as a radical educational innovation. The network available to the developers, through collaborative arrangements, facilitated the inception of this innovative tool with the international five-star hotels that agreed to participate in this novel exercise. The VFT offers a proactive and enterprising approach to student learning as a Web-based system that professionalizes the teaching of undergraduate students in a move away from teacher-centered pedagogy to student-centered pedagogy (Hannafin & Land, 2000; Keengwe et al., 2009). The VFT enables students to develop not only cognitive but attitudinal competencies too. Furthermore, the VFT tool helps students' personal development and offers opportunities for autonomous knowledge seekers by altering students' experience of reality. To be effective, the VFT requires students to be seriously committed and have the ability to replicate decisions in a variety of different situations. This allows for in-depth and coherent consideration of aspects of hotels' food and beverage operation. With assigned tasks for students, the VFT eliminates the random collection of information and leads to deep insights and understanding through critical thinking (Artello, 2014). The significance of the VFT is its functionality in providing students with a stimulus that generates their own learning in a self-reliant manner. Through intrinsic involvement students can merge the traditional pedagogical function of the classroom to the instrumental technology of the VFT in a more flexible manner (Staker & Horn, 2012).

The VFT offers students an interesting and entertaining education by challenging and intriguing them because it allows them to unpack the necessary knowledge and skills in a more meaningful manner (Sawyer, 2006). Kampylis et al.'s (2012) mapping framework of five dimensions for measuring the veracity of the VFT as an innovative concept shows high levels on all dimensions, with room for increasing innovation. Our findings further contribute to the use of the mapping framework of ICT-enabled innovation for learning and assist in the current understanding of innovation mapping tools. As Shu, Wong, and Lee (2005) observed, external links outside a university to an industry provide an advantage, in that the knowledge of the firm can be directly relayed to students. O'Sullivan-Gavin and Shannon (2014) explained how technology can enhance and complement course instruction in a collaborative virtual learning environment. Bocconi et al.'s (2013) innovation mapping tool offers intentional activity, whereby the innovator perceives a benefit to change with implications of novelty, and addresses the current need for institutional and pedagogical change. The generalizability of our

findings is limited to the particular course and the stakeholders involved. It is recommended that the VFT be applied to other courses and greater inclusion of additional stakeholders.

Students' reflection on their learning experiences provided some suggestions for improvements in the existing VFT. Such suggestions included incorporating a 360-degree view of each main area of the food and beverage operation of hotels so that students could encompass the whole context, along with greater use of additional images. Although the interviews with the general managers, executive chefs, and food and beverage managers were really appreciated, some students believed that including additional interviews with line staff at lower hierarchical levels, such as supervisors and frontline employees, would be beneficial to their understanding of the hotel's food and beverage operations. Indeed, the introduction of additional ideas by way of improvements to the existing VFT would be an example of innovative educational pedagogy (Chou & Chou, 2011).

## Conclusion

In conclusion, the overall VFT experience exceeded students' expectations with a format that was innovative, interesting, and useful to their learning experience. The VFT showcases five-star hotels' food and beverage operations through the use of video interviews with line managers and management, kitchen and restaurant views, floor plans and menus, as well as other interactive and PDF resources to assist students in the design of their own restaurant as part of their assessment. Implementation of the VFT was mapped on an innovation framework and shown to be innovative. The outcome was twofold: (a) providing understanding of ICT-enabled innovation for learning and (b) charting the impact of using an innovative ICT program in the education context. The nature of the change for students was radical in the scale implementation phase of development. The narrow access level is soon to be expanded to cross-border. The impact area or extent of innovation is new means of service, and the current target is a wide range of actors. Kamylyis et al.'s (2012) education innovation mapping framework shows the VFT to be highly innovative.

## Future Research

Further development of the VFT is envisaged as a response to student feedback. Post-VFT interviews revealed students' assessment of their experiences with reflections on ways to improve the site for future offerings. Greater use of video interviews with line staff

would improve students' experience. This contact with the hotel staff can provide motivation, which leads to success in the hospitality industry. Moreover, adoption of the VFT by other institutions and their assessment of the VFT's effectiveness will allow us to compare findings in different cultures and thereby improve the generalizability of results.

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