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

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## ABSTRACT

*This research examines students' experience with the innovative Virtual Field Trip (VFT) of hotels. Students undertaking an undergraduate Food and Beverage Management course participated in this research. The VFT included aspects of planning and operating the food and beverage function of hotels, and supplemented the delivery of face-to-face teaching to form a blended learning experience. Personal in-depth 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 is evaluated through application of Kampylis, Bocconi and Punie's (2012) mapping framework, designed to gauge the veracity of ICT-enabled innovation for learning. The results revealed that students' learning experience was enhanced by the existence of the VFT environment. Thereby students emerged to be active rather than passive learners, and helped in advancing their fundamental business graduate skills (i.e., problem solving and critical thinking), undeniably essential in preparing hotel leaders of tomorrow.*



**KEY WORDS:** Information and Communication Technology, Virtual Field Trip, Hospitality Education, Mapping Framework.


## INTRODUCTION

Today, in all walks of life, the application of technology is a dominating feature, which will constantly grow into more sophisticated forms in the future (Ferrari, Cachia & Punie, 2009). Particularly, in the context of education, we 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 multi-mode 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 digital competence of students by embedding curricula supporting interdisciplinary applications in tourism education (Morellato, 2014).

Further, 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 on-going reduction in government funding and rising competition, universities in Australia are being forced to move towards an economical teaching model (e.g., teaching a large number of students in lecture theatres). While this mode of course delivery is economical, it is far from effective in engaging and stimulating students' learning experiences (Prensky, 2001a). Further, 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 the increase in student enrolments have reduced academics' ability to offer students a meaningful insight into the real functioning of hotels through physically participating in the field trip experience. This situation inspired the development and implementation of a Virtual Field Trip (VFT) as an information and computer 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), where 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 Presley (1997), arguing that an 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 (OECD/CERI, 2010). Greene, Kisida and Bowen (2014) highlight that successful field trips require methodical planning by academics, as well as strong commitment of students to engage with the experience. For instance, an academic has to ensure the authenticity of the site (suitability of the destination and its operations compatibility with the course material), the activities during the trip (presentations, talks, tours, worksheets and demonstrations) and after the trip (discussions and reflections). The VFT allows linking the course material with the realism, which aids in the foundation for a long-lasting impression for students, since they witness the actual functioning of hotel operations and management practices.

This paper presents the VFT designed to develop authentic learning grounded in the curriculum and experienced through technology, and helps to addresses the removal of practical laboratories (i.e., training kitchen and restaurant), and the logistics of including the physical field trips in the hospitality education curricula. The VFT also answers the call to produce digital materials that effectively exploit the potential of the software to deliver educational outcomes and can enhance tourism students' learning experiences (Sigala, 2002). While there is a lack of empirical evidence of the effectiveness of a VFT in tourism education, this study intends to fill the gap by reporting on the implementation of hotels VFT and the impact on students' learning experiences through application of Kampylis' et al. (2012) mapping framework to measure innovation in ICT enabled learning. 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, the following literature review examines various theories related to digital learning, e-learning and innovation in education. The third section introduces the multidimensional mapping framework applied in this study, and is followed by the methodology, findings and discussion.

## CONTEXT OF THE VIRTUAL FIELD TRIP

The educators from a public university in Australia were engaged in a long-term strategy to develop and implement the 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 website that organizes a collection or pre-screened, 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 5-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 and menus and other supporting documents.

Students are 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 an opportunity 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 et al., 2013). These requirements result in students' intentional engagement in knowledge building through 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 the student 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 VFT are that first it blends both face-to-face learning with 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 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 enables the field trip experience to a greater number of students without sacrificing the quality of their learning experience. While 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 therefore academics are responsible for developing suitable strategies to promote student engagement along with adequately preparing them for the knowledge economy (Powell and Snellman, 2004). It is believed that information communication technology 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 trialled and evaluated the VFT as a tool to develop student learning. Unless we carefully elicit students' expectations and perceptions of a practical orientation course (food and beverage management), taught in a theoretical manner, we will not fully understand the effectiveness of their learning experience. Therefore, the main purpose of this research is to examine students' experience of a VFT using five star hotels' food and beverage operations. This paper relates the student's perceptions of how they engage with the digitally stored information and how satisfied they are with this learning environment. In our research we evaluate the veracity of an innovative concept of a VFT tool, using Kampylis' et al. (2012) mapping framework of five dimensions. This framework was developed for the European Commission's Institute for Prospective Technological Studies and is 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 have confidence with instantaneous access to information and spend 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, 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 generations' ability to respond faster to stimuli and develop their intellectual skills (Prensky, 2001b). This generation of students is labelled as 'digital natives', having born

and spent their entire lives interacting with technology, using mobile devices to communicate and search for information (Prensky, 2001a). More recently, the 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 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 it 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 VFT can provide academics 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. While there is evidence of the application of technology in the form of VFT in teaching disciplines, such as history, geography, anthropology, farming and alike, similar evidence in the teaching of tourism and hospitality management is missing.

However, some interest in the application of VFT in hospitality has begun to emerge. Students engaged with the VFT found it to be a useful learning resource as it supplements lectures and literature through textbooks and scholarly journals (Patiar et al., Forthcoming, Spring 2017). Thus, the VFT teaching strategies promote learning by doing, problem solving and developing creativity (Law, Yuen & Fox, 2011). Developments in technology rich learning environments is a result of the growing computer literacy of generation Y, and

the best and most instructionally sound ways technology can be used are 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, Kampylis & Punie, 2013). OECD/CERI (2010.p.14) defines 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 existent product or process (Chou & Chou 2011), whereas in the context of education it is perceived as pedagogy that is new and produces distinct changes to 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). While 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 centre 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 stimuli activates brain imagery which enhances learning and memory creation (She & Fisher, 2003). Further, research shows 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 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 to think critically and solve problems (Sigala, 2002).

## MULTIDIMENSIONAL MAPPING FRAMEWORK

Kampylis et al. (2012) propose 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 Kampylis et al.'s (2012) framework, although they applied it at the macro level, our study applies the framework to a micro venture of a VFT. No other tool for evaluating innovation in education or e-learning was found. Rather than develop different nomenclature, Kampylis et al.'s terms were used in the framing of our analysis. Kampylis, et al.'s (2012) mapping framework comprises of 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. This framework offers the following five dimensions:

1. Nature of innovation - incremental, radical or disruptive - capturing the level of organizational and pedagogical change (Leadbeater & Wong, 2010 OECD/CERI, 2009).
2. Implementation phase - pilot, scale or mainstreaming - describes the current stage of development in increasing uptake scale (OECD/CERI, 2010).
3. Access level - local, regional or cross border - capturing the geographical coverage (OECD/CERI, 2010).
4. Impact area - process, service or organization - refers to the extent of innovation (Robinson, 2001).
5. Target - single actors, multiple actors, or a wide range of actors, and this delineates 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 the implementing the existing VFT of hotels food and beverage operation. Features are analysed against the different trajectories of the mapping framework


**Figure 1.** A mapping frame-work of ICT enabled innovation for learning (Kampylis, et al., 2012).

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. VFT offers a way to engage and develop students' ability in an effective and efficient fashion than conventional teaching methods. Innovation through the VFT learning process compliments the traditional face-to-face learning processes. The following two research questions were posed:

How innovative is the VFT of hotels' food and beverage operation?

How does VFT of hotels food and beverage operation contribute to students' learning experience of 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 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 that were interviewed represented a fairly even spread, based on their

gender, grade point average and on their status (domestic and international). Pre-course expectations-related interviews were conducted with eighteen students (ten female and eight male) 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, post-course experience interviews were conducted with the same eighteen students (ten female and eight male) at the end of semester after students' had the opportunity to engage with the VFT and attempt various pieces of assessment during the course delivery to ascertain their reflections of 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 is informatively representative as saturation of concepts were achieved (Morse, 2000; Sandelowski, 1995).

As discussed above, participant sampling ensured 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 semester and a $10 gift voucher for the post interviews towards the end of the semester were offered. These incentives were designed to encourage and thank those students for their participation. Participants were provided with an information sheet, which 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 the both interviews sessions to allow students to reflect and elaborate on their expectations and experiences. See Tables 1 below outlining sample questions. A researcher, in a private office space, conducted both sets of face-to-face interviews in two different points in time during 2014. The interviews were digitally recorded and transcribed verbatim. Each interview lasted between 10 and 20 minutes.

**TABLE 1 Pre and Post Course Interview Questions to Gauge Students' Expectations and Perceptions**

| |
|---|
| **PANEL A** |
| **Pre-course interview** |
| Question 1: What do you expect to get out of food and beverage management course this semester? |
| Question 2: What are your expectations of the VFT website in terms of the content it should provide? |
| Question 3: What are your expectations of the VFT website in terms of the layout and ease of its navigation? |
| **PANEL B** |
| **Post-course interview** |
| Question 1: What is your overall impression of the VFT website? |
| 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? |

Two levels of coding helped conduct analysis of the empirical material. First, a line by line analysis identifying key words usually in a gerund (verb or 'doing' format) followed by a second level of coding, which subsumed the codes into a higher order concept reflecting the main themes identified by students. These themes were then aligned with the five dimensions in the innovation in learning mapping framework described above, and are demonstrated by verbatim quotes from the students to give 'voice', thus privileging them as the 'experts' in the learning process. The next section presents the findings of the student's expectations and experiences. Excerpts from the interviews are provided and distinguished with pseudonyms. A discussion of the pre and post course 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 the 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. (2012) multidimensional mapping framework shows that the VFT is highly innovative blended learning pedagogy been developed and implemented in the teaching of hotel management program, see *Figure* 2 below for details and further elaboration.

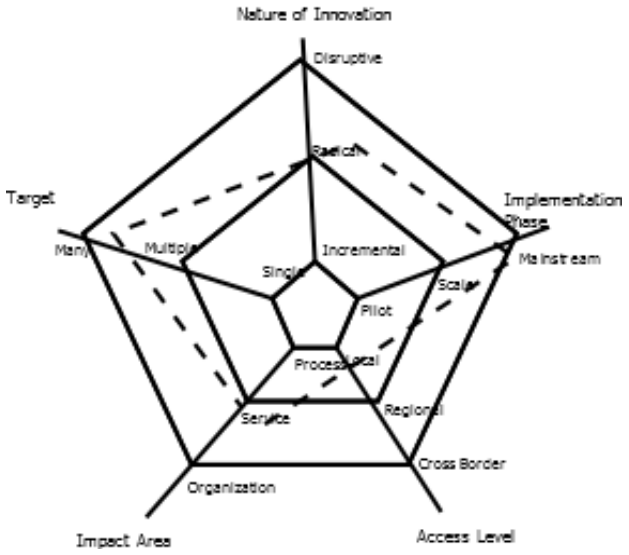


**Figure 2. A mapping frame-work of VFT innovation - adapted from (Kampylis, et al., 2012).**

In regards to the nature of innovation in VFT, it was radical change, in that it was a new process, yet still merged with existing pedagogical practices. The implementation phase is scale in that the VFT is still in development stages. Access level is still local with plans to implement at the 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.

While the mapping framework has been applied to the VFT, an in-depth analysis is necessary for more evidence based mapping, and this is related below:

*1. Nature of innovation:* VFT started as a radical innovation and efforts are underway 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 of 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 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 post evaluation'.*

Student expectations of the VFT website 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 virtualed 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 would with active links to other departments within hotels and some external sites. Post VFT experience reveals all students found the website interesting, helpful and enjoyed the learning experience through the VFT. The students' placement of high value of the VFT was reflected in common use of the word 'cool' and was considered to be innovative, provide 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 student appreciation of hotels' food and beverage operations. Without exception students found the concept of VFT innovative as demonstrated by Julie:

> '*I've been at Uni for two 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 website helped in bridging the gap between theory and practice, more specifically 'to workplace areas'. These include food and beverage operations, food service and 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 iterated 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 not only allowed students to explore the hotel properties sites in their own pace and revisit if necessary to grasp the concepts fully. This encouraged deeper learning of the intricacies of managing a complex food and beverage operation of large five star international standard hotels.

Most students found that the VFT website functioned well and was 'user friendly and informative'. Students found the VFT visually appealing and 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 smart phone 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 had been accessible if students' were 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.

*2. Implementation phase:* Now in its third year, 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 featuring in the VFT. This will internationalize the curriculum, offering students' full access to a global spectrum of VFT experiences.

*3. Access level:* VFT is currently offered at a local level, within one University on two campuses however, new developments mean the VFT will be offered to a cross-border institutions, particularly in the Asia Pacific, the United Kingdom and the USA. Overwhelmingly, the material covered in the VFT was considered to greatly assist students understanding of 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 that students were unaware of in food and beverage management, 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 an insight into the roles of key managers of hotels. This executive team, their views and

practice of management skills, stories of their success at the participating hotels, can be seen as role models. As 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.

*4. Impact Area:* VFT is currently offered at one course level in the department of tourism and hotel level and may in future impact on the entire degree program and to the other degree programs at the university level. Sangrà and Gonzláez-Sanmamed (2010) contend that Information and Communication Technologies (ICT) improve the quality of learning at the graduate level. Open and experimental learning methods enables improvement on the baseline knowledge students possess and improve upon this information by enhancing curricular 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 provision of floor plans of the two hotels' several restaurants facilitated their conceptualization and understanding of the importance of location, both within the hotel and the layout functionality of a well-designed restaurant and kitchen. Through the VFT, students were able to access details of 'behind the scenes' of 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.

*5. Target:* VFT current target group are tertiary students at two different campuses. However plans are to offer students at multiple international campuses with access to VFT. In relation to the student's opinions of other expectations that were not covered in the previous questions, many students iterated that they expected practical and theoretical understanding. In addition, extra assistance from the teaching team to assist their understanding of 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 the concept to the 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 the information was 'underwhelming' and the remaining two commented that the descriptions provided in VFT were vague.

**DISCUSSION**

The reflective responses of students' experiences, depicted in this paper, 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). VFT provides students with a rich learning opportunity, improving their satisfaction and increasing outcomes. While 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 website. 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. VFT stimulates students through sequencing and unpacking their learning tasks which increases in complexity as they progress through the course content and assessments. VFT offers symbolic meaning through restricted access to students enrolled in the food and beverage management course, core within hotel management curriculum. Westera (2005) identifies four modes of involvement with technology: as 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. Students through VFT 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 (2001a and b) lines of argument, that digital natives are more comfortable with technology maximizing their capacity for a positive learning experiences.

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). VFT can be used in education and measure its educational impacts in terms of two learning outcomes - information transfer through visual capabilities and maximizing cognitive load of the learning processes (Morellato, 2014).
We found measurable outcomes of student satisfaction and improved educational performance as a result of using VFT. The most innovative classrooms are those where students use technology to support their learning and connect with the broader world (Kumar, et al., 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, 2005; Conole, 2010). VFT is an excellent example of a blended learning initiative, which 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 teaching of undergraduate students in a move away from teacher-centered to student-centered pedagogy (Hannafin & Land, 2000; Keengwe et al., 2009). VFT enables students' to develop not only cognitive but attitudinal competencies too. Furthermore, VFT tool helps students' personal development and offers autonomous knowledge seekers by altering students' experience of reality. To be effective, 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 VFT is its functionality to provide students with 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 an instrumental technology of the VFT in a more flexible manner (Staker & Horn, 2012).

VFT offers students an interesting and entertaining education by challenging and intriguing them, because it allows them to unpack the necessary knowledge and skills into a more meaningful manner (Sawyer, 2006). With the help of Kampylis et al's (2012) mapping framework of five dimensions to measure the veracity of VFT as an innovative concept, it

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 assists in the current understanding of innovation mapping tools. As Shu, Wong and Lee (2005) observe, external links outside the university, to an industry, provides an advantage, in that the knowledge of the firm can be directly relayed to the students. O'Sullivan-Gavin and Shannon (2014) explain 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 was limited to the particular course and the stakeholders involved. It is recommended that the VFT could be applicable 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 food and beverage operation of hotels so students could encompass the whole context, along with greater use of additional images. While the interviews with the General Managers, Executive Chefs, and Food and Beverage Managers were really appreciated, some students believed that the inclusion of 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 the 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 was exceeding students' expectations with a format that was innovative, interesting and useful to their learning experience. The VFT showcases 5-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 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 two-fold: (i) providing understanding of ICT-enabled innovation for learning; and (ii) to chart 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. A narrow access level is to be soon 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. Kampylis et al.'s (2012) education innovation mapping framework shows the VFT to be highly innovative.

## FUTURE RESEARCH

Further development of VFT is envisaged as a response to student feedback. Post experience of the VFT 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, adaption of VFT by other institutions and their assessment of VFT's effectiveness will allow us to compare findings in different cultures and thereby improving the generalizability of results.

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