REAL WORLD LEARNING WITH AUGMENTED REALITY

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Abstract - Through real-world learning of a special event project, 48 students enrolled are given the opportunities to plan, organize, manage, and evaluate a real international conference. Students designed innovative activities for the conference by applying current Augmented Reality (AR) technologies. After reflection, some students immediately applied what they learned from the special event project to their real employment as conference planners.Students are empowered to understand and develop latest information and communication technology (ICT) application to the hospitality and tourism sector, which can enhance their employability in the near future.

Index Terms - Augmented Reality, Conventions and Events, Experiential Learning, ICT.

I. BACKGROUND

Adopting Convention and Events industry standards, faculty developed two special event subjects to provide challenging opportunities for students to practice their management and organisational skills in real-life settings. Throughout the nine-month curriculum delivery period, students integrate and synthesize the resources, staff, time, costs, skills and steps to complete innovative event projects - planning, organizing, managing and evaluating with over 400 delegates: The Third Global Tourism and Hostility Conference (3rd GTHC). Taking the conference theme - innovation, research, and education, students designed innovative activities for the conference by applying current Augmented Reality (AR) technologies. Through the experiential learning cycle, students learned AR theories, pedagogy and concepts, developed their objectives, created and constructed overlays and triggers, and captured feedback. After reflection, some students immediately applied what they learned from the special event project to their real employment as conference planners of the eLearning Forum Asia (eLFA) 2017 held in Hong Kong and attended by 250 international delegates.

The latest technologies have transformed the travel experience of tourists with the contributions of different tools: three dimensional (3D) display, Global Positioning Systems (GPS) mapping, bar code scanner, compass, Wi-Fi, accelerometer, mobile phone, smart phone applications (apps) and augmented reality (AR) (Craig, 2013; Samardžija, 2015, p.130). Tourism, as one of the most productive economic activities in the world, has the potential to obtain great benefit from AR technology.

II. SPECIEAL EVENT PROJECT

This project aimed at promoting active learning. The capstone project which allows students to develop practical special event projects by applying concepts of planning, organization and management which was learned in previous related subjects. Students need to integrate and synthesize the resources, staff, time, costs, specific skills and steps to complete innovative event projects which culminates in an in-depth analysis of the project's performance. The project's intended learning outcomes include:

- **Professional Competence**
  Students will be able to demonstratethe knowledge and intellectual skills needed for operational competence (professional, business, human, management and social skills) in special events operations.

- **Critical Thinkers**
  Students will be able to discuss and explain how various systems respond to business and customer needs and requirements and applythe concept of event planning to a range of menus for differing meal experiences and organizations. Students will be able to analyze and critiqueexisting and proposed meetings, and justifysolutions to inherent problems. Students will also be able to display creative and analytical skillsin managing event assignments.

- **Effective Communicators**
  Students will be able to appraisethe work of the other management teams by effective communication mechanisms such as regular meetings and reporting and combining their efforts to meet the project's objectives. Students will be able to communicate and reactproactively with stakeholders in the hospitality and tourism industry in the area of special event management.

- **Innovative Problem Solvers**
  Students will be able to analyze and critique existing and proposed meetings, and justify solutions to inherent problems.

- **Lifelong Learners**
  Students will also be able to develop and

demonstratethe principles of effective management and supervision such as planning, organization, directing and controlling all available resources in order to achieve the stated objectives.

- **Ethical Leaders**
  Student will be able to applyknowledge and concepts of special event management to real world situations in individual and team-based work.

III. PROJECT OBJECTIVES

Through this real-world learning special event project, students are empowered to understand and develop latest information and communication technology (ICT) application to the hospitality and tourism sector, which can enhance their employability in the near future. The focus is AR where students would be able to:

- understand the principles of AR and hold a basic knowledge of the technology used to develop AR
- analyse how AR is being used in education and hospitality and tourism
- examine with peers areas where AR can enhance practice and benefit practice & services.
- define the parameters and consideration needed when applying AR to hospitality and tourism or Digital Communication.
- create AR content using the appropriate application by linking images to multi-media content.

IV. APPROACH

Experiential learning has long been an approach used in hospitality and tourism. Kolb's (1984) cycle starts from abstract conceptualization, with active experimentation, then turns into concrete experience. Through reflective observation we are led back to rethinking of the abstract concepts, which was the focal point for applying hospitality learning through work integrated education (Dev, 1990; Whitney, 1984).

More than ever, educators are exposed to modern technologies and innovative platforms to transform the way teaching and learning is experienced. The SAMR Model, introduced by Puentedura (2009) introduces how technology provides opportunity to transform learning through different levels of modification and activity re-design. With the ultimate goal being 'Redefinition' of tasks "that have been previously inconceivable without the technology", the SAMR model (Puentedura, 2009) begins with technology acting as a substitute for an existing tool, before introducing 'Augmentation'- that tool creating functional improvement.

V. METHODS

A quantitative approach was adopted in this study. A post-workshop questionnaire was used to understand students' learning experience on setting up AR. Another survey was conducted during the two conferences. Based on the Aura created for the conferences, conference stakeholders were asked questions on their experience on AR.

VI. IMPACT AND RESULTS

During the face-to-face workshop and via the online module within the learning management system, students were introduced to 3 case studies of applying AR to hospitality& tourism, retail and entertainment industries. Firstly students learned how the UK's largest digital retailer integrated AR digital content into their store catalogues and app for over 8 million users. Additionally, students saw how one of the world's top five consumer product companies applied AR to its omnichannel marketing campaign and global digital experience, before observing how the world's leading theme-park resort adopted AR to reach beyond its park walls and resulted in a 25% increase in AR-enhanced merchandise sales. For each case study, students analysed the link between the company background, the need for adopting AR technology, the solutions identified and the end-product of its successful adoption, before reflecting on these cases and transferring key points to their own conference planning.

A total of 48 special event project students attended the Face-to-face (f2f) Workshop, entitled; how can conferences use AR to engage with their stakeholders more effectively? With a response rate of 81%, the session evaluated as:

	Mean
The format of the workshop is suitable	4.13
The overall learning experience of the workshop is good	4.16
The workshop is useful for conference planning	4.11
I am likely to use AR in the future	4.18
I need to know more about AR before using it	4.36
You would recommend the use of AR to a friend/colleague	4.23
The prior outlined workshop objectives were met	4.10

Data captures from 202 attendees from both 3rd GTHC and eLFA 2017 conference delegates included:

	Mean
It is an interesting experience in using the AR conference apps	4.19
It stimulates audio-visual appeal	4.14
I predict that I would use AR conference apps in future conferences	4.13
The AR conference apps is clear and understandable	4.06
Using AR makes me better informed about conference-related information	4.06
It utilizes curiosity to draw learner/users into the activity	4.06
The AR conference apps is easy to use	4.04
It acts as scaffolding for learners/users	3.96
It fits with constructivist learning	3.94

DISCUSSION

Via the experiential learning cycle, students continuously reflect on their experiences by completing reflective journals and presenting to their peers. Analysis with their academic dissects their reflection to identify areas of improvement and achievable actions, whilst face-to-face workshops are designed to ensure a balance between active and constructivist learning, supplemented with discussion and 'free roaming.' Rather than a traditional instructor-led approach, AR content is positioned around the learning environment. Utilising all four walls, the conventional classroom is transformed into a 360 degree interactive learning tool, encouraging participants to explore and interact with different multimedia learning content that adorns the walls. Self-paced free roaming at key intervals allows students to absorb digital content which is overlaid onto the real world, providing a more transformational experience before coming together again as a group to discuss constructed knowledge in peer-to-peer interaction.

The Special Event Projects are unique in their inception for experiential and active learning in industry. Students enhance their employability by:

- demonstrating their knowledge and intellectual skills needed for operational competence (professional, business, human, management and social skills) in special events operations;
- discussing and explaining how various systems respond to business and customer needs and requirements and apply the concept of event planning to a range of menus for differing meal experiences and organizations. Students are able to analyze and critique existing and proposed meetings, and justify solutions to inherent problems. Students are also able to display creative and analytical skills in managing event assignments;
- appraising the work of other management teams by effective communication mechanisms such as regular meetings and reporting and combining their efforts to meet the project's objectives. Students are able to communicate and react proactively with stakeholders in the hospitality and tourism industry in the area of special event management;
- applying their knowledge and concepts of special event management and modern technologies to real world situations in individual and team-based work;

Upon finishing the project and subjects, a group of students gained employment as conference planners for eLFA 2017. Here, they applied their knowledge of Augmented Reality application to the Forum. Following Kolb's (1984) learning cycle, the project was delivered through learning by experience. Students then followed the learning cycle: learn, plan, experience, understand, redefine, apply and reflect what they learned from the real life settings.

RECOMMENDATION

A. This project's learning approach will be applied to the same subjects in the future and extended to other subjects in the School. Materials and resources can be shared with executive programmes, whilst the AR adoption approach will also apply to other conferences and events.
B. Institutional initiatives have led to a Community of Practice (CoP) for Augmented Reality, Virtual Reality & Gamefulness being proposed. This CoP will welcome active practitioners, both staff and students, with notable experience and skill in the development of AR, VR and Gamefulness and in particular the application of these innovations and methods to teaching and learning practice.

1) CoP for Augmented Reality, Virtual Reality & Gamefulness; short-term goals:

- Enable the dissemination of knowledge, skills and experience to overcome challenges via fun and meaningful participation.
- Provide co-ordination, increased understanding and collaboration between practitioners and sections towards institutional goals.

- Facilitate a forum for problem-solving and sharing of facilities, equipment and environment to increase quality and reduce replication of resources.

2) CoP for Augmented Reality, Virtual Reality & Gamefulness; long-term goals:

- Expand the community externally and internationally to establish a professional network hub of knowledge, skills and expertise – established professional identity.
- Influence and enable a strategic plan in alignment with the institutional strategy and aims (2018-19) to foresee and integrate technological developments.
- Increase capacity to devise and deliver research-focused projects and market-focused opportunities.
- Attract and develop active practitioners and experienced students to further expand the communities reach and impact.
- Collectively benchmark projects and innovations against industry standards and enhance practice through QA/QE methods and student feedback.

REFERENCES

[1] Craig, A. B. (2013). Understanding Augmented Reality: Concepts and Applications. Waltham, MA: Elsevier.

[2] Samardzija, A. C. (2015). Mobile augmented reality interactive systems for urban tourism. Paper presented at the Central European Conference on Information and Intelligent Systems.

[3] Kolb, D. A. (1984). Experiential Learning: Experience as a Source of Learning and Development. Englewood Cliffs, NJ: Prentice-Hall.

[4] Dev, C. S. (1990). Measuring the Value of Experiential Learning. Cornell Hotel and Restaurant Administration Quarterly, 31(2), 105-107.

[5] Whitney, D. L. (1984). A Model for Experiential Learning. Cornell Hotel and Restaurant Administration Quarterly, 25(2), 52-53.

[6] Puentedura, R. (2009). As we may teach: Educational technology. From Theory Into Practice.

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