USING SATELLITE IMAGERY AS NAVIGATION TOOLS IN VIRTUAL SERIAL VISION (VSV) TO SUPPORT URBAN VISUALISATION AND DESIGN

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Highlights: This study highlighted how the Virtual Serial Vision (VSV) project had been applied in a pedagogical exercise in the Urban Planning Theory. This paper aims to enhance the student's learning experience by integrating virtual navigation into serial vision using satellite imagery. The VSV project has been developed based on the five stages in Design Thinking Theory. Although the VSV project was developed for the students, the application is also applicable and beneficial for the professional practitioner to support urban visualisation and design.

Introduction

Recently, the teaching and learning method of the Urban Planning Theory course has changed from face to face to online learning. Hence, a conventional practice used in this course, especially for Serial Vision, is inefficient and needs to be upgraded. This paper urges for an integration of virtual navigation developed from the work of Gordon Cullen. Therefore, this paper aims to enhance the student's learning experience by integrating virtual navigation into serial vision using satellite imagery.

Background of the Virtual Serial Vision project

For the past several years, the delivery of serial vision is mainly using traditional methods based on 'The Concise Townscape' (Cullen, 1971). He presented elements of townscape as an 'Environment Game' through the concerning optic (Serial Vision), concerning place (Here and There) and concerning content (This and That). This study explores the connection between serial vision and virtual navigation, leading to better urban visualisation and design. In the Sheffield Urban Contextual Databank (SUCod) project, Peng, Chang, Blundell and Lawson (2002) and Peng (2003) developed a Web-based virtual city platform to produce a new kind of virtual city application that allows end-users to reconstruct urban contexts online. Asanowicz (2011) integrates digital technology with urban composition teaching in serial vision.

Importance of the Virtual Serial Vision project towards Urban Visualisation and Design

The VSV project was helpful for the student to empower critical thinking and decision making because it encourages the advancement of self-navigation that gives the autonomy for the students to construct their serial vision route. Most importantly, the VSV project reveals the prospects of virtual navigation supported urban analysis and design in urban landscape studio through online sources. The virtual navigation further emphasizes that the VSV project aims to align with the global world trend and accommodate the Fourth Industrial Revolution in education. These fundamental abilities will give students the lift required to succeed in universities and future professions. The VSV project may benefit the educational community members as well in terms of teaching methods and approaches.

Advantages of the Virtual Serial Vision project towards education and community

The VSV project allows students to be self-directed and flexible to work within their timeline and location without the need to travel. Furthermore, the VSV project had improved students' knowledge, ability to foster spatial thinking and develop critical technology and thinking skills through Satellite Imagery. Solem and Gersmehl (2005) have demonstrated that online resources have helped improve student comprehension of significant concepts and skills while helping students gain confidence in their knowledge of geographical issues. Monet and Greene (2012) also support the use of Google Earth and Satellite Imagery to foster place-based teaching due to the students' difficulties in interpreting the geologic processes that shape the local and regional natural environment characteristics.

The design process of the Virtual Serial Vision project using Design Thinking Theory

The design process of innovation in virtual serial vision encompasses five stages of Design Thinking Theory: Empathise, Define, Ideate, Prototype and Test. The first stage of the Design Thinking process was to understand the students' perspective by identifying and addressing the problem. For example, not all the group members live in the same case study compound. Hence,

some cannot participate in going to the site and cannot produce manual sketches of serial vision. The second stage was to define the problem statement clearly. The brainstorming session was conducted in the meeting of the project brief attended by lecturers in the Landscape Architecture Department. Brainstorming members brought different approaches to comprehend problems and yet provide various ideas of consideration. Next, the ideation stage was composed of two steps which were idea generation and concept development. Researchers used the KJ method for idea generation. The output from the KJ method was used as a starting point for the concept development step involved the clustering, combining, and selecting of the ideas generated and then further developed the selected ones. During the prototype phase, 51 students from 10 groups were engaged in the VSV project using the Satellite Imagery as a navigation tool. The implementation of the VSV project will be upgraded based on the current advancement of technology and the users' feedback throughout the testing phase. In the testing phase, the VSV project was built based on three pillars: assumptions using a storyboard as a planning tool, prototyping where the critique session happens with the lecturer to control the potential impact of the experiment, and running the experiments through recorded video.

Commercial value of the Virtual Serial Vision project
The VSV project provides lecturers, students, and professional practitioners with access to technologies and opportunities to reflect on their practice. The virtual navigation can be used as an enhancement tool in the site visit, survey, inventory, and analysis.

Acknowledgement

References

Asanowicz, A. (2011). Digital "serial vision"-new approach in urban composition teaching. Proceedings of the 29th eCAADe. University of Ljubljana (Slovenia), 21-24 September 2011, pp. 716-724.

Cullen, G. (1971). *The Concise Townscape*. London: The Architectural Press

Monet, J., & Greene, T. (2012). Using Google Earth and satellite imagery to foster place-based teaching in an introductory physical geology course. Journal of Geoscience Education, 60(1), 10-20.

Peng, C. (2003). Serial vision revisited: Prospects of virtual city supported urban analysis and design. Proceedings of the 10th International Conference on Computer Aided Architectural Design Futures. Tainan (Taiwan), 13–15 October 2003, pp. 259-270

Peng, C., Chang, D. C., Jones, P. B., & Lawson, B. (2002). Exploring urban history and space online: design of the virtual Sheffield application. Design Studies, 23(5), 437-453.

Solem, M., & Gersmehl, P. (2005). Online global geography modules enhance undergraduate learning. AAG Newsletter, 40(8), 11