

Supporting Urban Design Learning with Collective Memory Enhanced Virtual City

The virtual Jalan Malioboro experiment

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Abstract. *The paper reports on the observation of how students can be supported in urban design learning through the use of an experimental collective memory enhanced virtual city - Virtual Jalan Malioboro. This study focuses on how instances of people's collective memory of the Malioboro Street could be digitally represented and connected with the 3D models of buildings and places of the street. An evaluative study was conducted in a real university educational setting to test how it can support urban design learning. The results show that by enhancing 3D models with collective memory, students are facilitated to become more engaged with the urban site and knowledgeable of historical contextual issues.*

Keywords. *Urban design; virtual learning environment; collective memory.*

INTRODUCTION

The use of virtual learning environment to support learning in design education context is continuously improved and have shown potential in supporting design processes and discussions (Vecchia et al, 2009). This paper investigates on how students can be supported in urban design learning through the use of collective memory enhanced virtual city.

In urban design learning, urban context is something that a student has to be aware to gain comprehensive knowledge about buildings, a site or places before creating a new design. A more context sensitive design could be created by investigating the social and architectural history of buildings or places and connecting the memory of the past urban form and current needs (Blundell Jones et al., 1999). However, historical data and memory of the city in the past are not always easy to be found.

This study focuses on how instances of people's collective memory could be digitally represented and connected with 3D models of virtual city as well as how this assembly could be used to support students' urban design learning in a university level.

Scholars have studied memory for decades in many disciplines. This has brought the increasing elusiveness of memory as meanings, concepts, and phenomena of memory could be diverse (Brockmeier, 2010). Sometimes metaphors and analogies are used in order to understand phenomena in a more or less appropriate way. And there is no way to prove a metaphor wrong or right (Magnussen and Helstrup, 2007).

In media and technology studies, combining multimedia and multimodal facilities such as text, graphic, image, film and audio, multimedia comput-

ers and the Internet can be employed to produce digital collective memory (Brockmeier, 2010).

CONCEPT AND DESIGN OF COLLECTIVE MEMORY ENHANCED VIRTUAL CITY

The concept of collective memory was first introduced in the 1920's by the French philosopher and sociologist Maurice Halbwachs (1877-1945). He defined collective memory not as a socially constructed idea about the past, but rather as a socially shared notion, a way that a group conceptualized the past while in the present (Halbwachs, 1992). In his concept, monuments and other topographical features are central in the formation of a collective memory.

More recently, in her book *The City of Collective Memory* (Boyer, 1996), M. Christine Boyer, Professor of Urbanism at the School of Architecture Princeton University, described collective memory as the way the urban public compose their images of the city. In the city of spectacle, she described that computer-simulated visual environment has transformed the material world – the bits and pieces of the city – into an ephemeral form. Global electronic media have changed the relationship of collective memory, history and the city spaces and the process of remembering the past is enacted as a set of reconstructed images.

The Library of Birmingham conducted “People’s Archive” project [1] in 2010, in which the city community is involved to share knowledge or memory related to particular places. In this project, a website hosting hundreds of photos taken from the Birmingham Archive is used as an interface for the public to add information relating to the images selected from the Archive. The information could be about the dates, names of buildings or personal stories. According to Kuhn (2010), a repository of memories such as a photograph album can act as reminders of persons, places, or events in the past and can function as substitutes for remembering and used as by their compilers/owners as prompts for performances of memory in private, interactive, collective and sometimes even public context.

In review of the collective memory concepts, we approach collective memory for this study as a digital album containing all kinds of digital records of the history and story of buildings and places of a city that is either elicited from or produced directly by the city’s residents or visitors. 3D models of a virtual city become an interface through which process of remembering can be mediated.

The idea is that initial instances of people’s memory associated with a particular segment of a city could be gathered into a repository (ie. a collective memory bank) as ‘seeds’ to grow further contextual and historical information contributed by others. In representing collective memory of buildings or places digitally, we interlink virtual 3D models to these memory instances and to other historical resources found from many different websites to become what we call a collective memory enhanced virtual city (CREATI) (Felasari and Peng, 2010). Through CREATI, registered users could add and share the content of the collective memory.

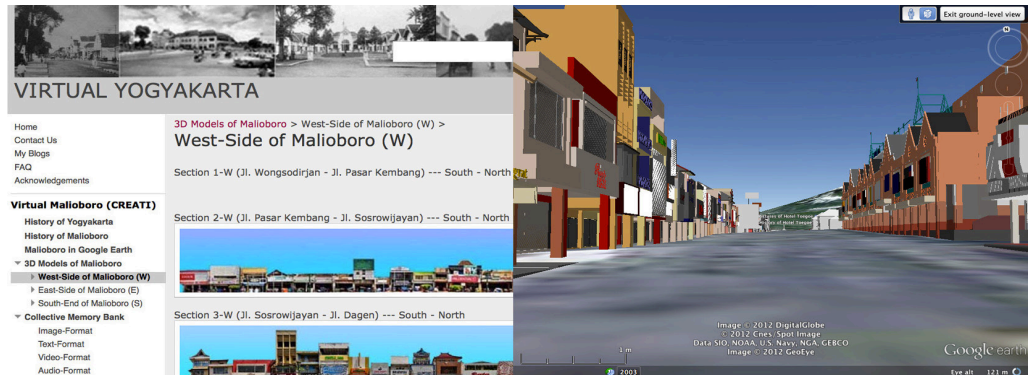
Connecting collective memory and virtual city

To develop a virtual city enhanced with collective memory, we have been experimenting with a Google site as an implementation tool. The site is designed to support urban design learning. According to Boeykens and Neuckermans (2009), A Virtual Learning Environment has the characteristics of both content and learning management. In terms of architectural education, it might incorporate interactive 3D worlds (Vecchia et al., 2009). We designed CREATI as a virtual learning environment through which students can access 3D models of a virtual city linked with records of collective memory and urban design course information.

Our study used a historical street at the centre of Yogyakarta city in Indonesia called Jalan Malioboro (Malioboro Street) as a case study site. About 1.2 km of the street with buildings and places along the side have been digitally modeled and hosted in a website. The 3D models required the students to have the Google Earth installed in their computer so as they can be displayed [Figure 1].

Figure 1

A website hosting 3D models and a collective memory bank (a) 3D models displayed using Google Earth (b) (Source: <http://www.site.virtual-yogyakarta.info/3d-model-of-malioboro>).

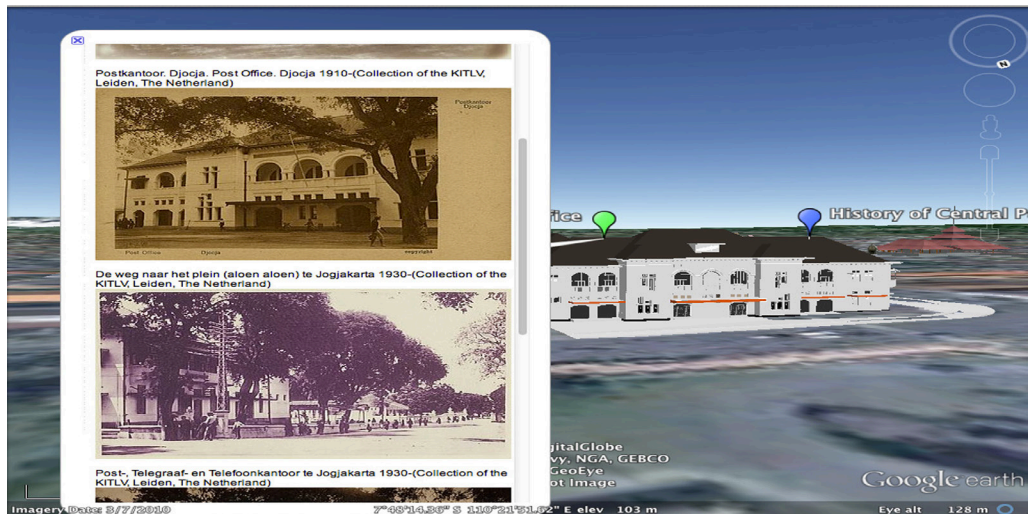


In generating a collection of memory records we used the 'placemarks' menu of the Google Earth to write or to link the information to the 3D models and save them as kmz files. The 'placemarks' have coordinates embedded (latitude, longitude, and altitude) so as a memory record will visually appear at specific location inside the 3D Google Earth model [Figure 2]. Nevertheless, the 'placemarks' have limitations such as they cannot be associated with a large area/region such as a building complex, street, or a district in a clear meaningful way.

We organized the structure of the collective memory repository into different formats (image, text, video, and audio). In each format we divided the memory records into several sections based on the locations of buildings and places in the urban context. At present, this structure of the repository is specific to the study site and may not be applicable to other locations in Yogyakarta or to other cities.

Figure 2

An example of memory record consists of photographs showing building facades in the past. (Source: photographs taken from <http://www.kitlv.nl/>).



THE VIRTUAL JALAN MALIOBORO
EXPERIMENT

We conducted a pilot experiment in a real educational setting at university level to evaluate the effectiveness of CREATI in supporting urban design learning. We invited 30 students grouped into four to take part in the experiment. As a part of urban design assignment, students were given an urban design project in which it consists of both a group task and an individual task.

In the experiment, Jalan Malioboro was used as the project site and was divided into 4 sections/sites. Each group had to choose one site where each member will collaborate to author memory records related to buildings and places on that particular site either in text, graphic, video or audio format. In producing the records, a student could use existing

sources found available digitally and connecting them with the relevant 3D models, or they can produce their own memory records to be shared with each other. Besides the individual task, the students were also required to submit a joint design proposal for their site. We then compared the content of the collective memory from each student and that of the design proposal.

Based on the assignment guideline, students were expected to propose design concepts based on the analysis of findings, which should be based on theories for analyzing urban spaces. For instance, the theories of urban space quality derived from Gordon Cullen's Townscape design (Cullen, 1961) and Raymond J Curran's Urban Experience (Curran, 1983) are the two main references were introduced to the students among many others.

GROUP 4	Collective Memory							
	Number of content recorded from each member of group							Total Content Recorded
Student Group Member	a	b	c	d	e	f	g	
Texture	3	1	0	0	0	0	0	4
Scale and Proportion	1	1	0	0	0	0	0	2
Colour	1	0	0	0	0	0	0	1
Architectural Styles	2	1	1	0	0	0	0	4
Places Linkage and Continuity with Historical Tradition	0	0	1	0	1	0	1	3
Places Linkage and Continuity with Cultural Tradition	1	0	1	0	1	1	1	5
Optical Viewpoint or Serial Vision	0	0	0	0	0	0	1	1
Interrelatedness among Urban Elements	2	1	1	0	0	0	0	4
Ground Treatment and Furnishing	0	0	0	0	0	0	0	0
Form and Content Relationship in Individual Building	1	1	0	0	0	0	0	2
Facades and Surfaces	3	0	0	1	1	0	0	5
Expressive Quality of Spatial Form	0	0	0	0	0	0	0	0
Expressive Quality of Building Relationship	1	1	0	0	0	0	0	2
Exposure and Enclosure	0	0	0	0	0	0	0	0
City or Urban Images	1	0	1	0	1	0	1	4
Building Skyline and Visual Continuity	0	0	0	0	0	0	0	0
	16	6	5	1	4	1	4	37

Table 1
Participation of group's member in developing the content of collective memory records.

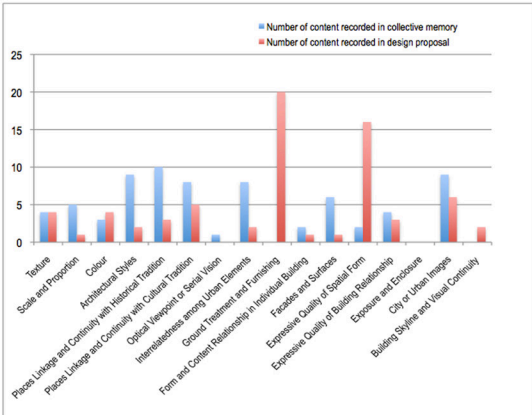
RESULTS AND DISCUSSION

Student participation in developing the content of collective memory record

It is expected from the experiment that the content of collective memory composed by students are complement to each other. Using 15 parameters of urban space quality derived from Gordon Cullen’s Townscape design and Raymond J Curran’s Urban Experience, the content of collective memory were classified and analyzed for the purpose of urban design learning.

Table 1 shows an example of how each member of a particular group (a-g) has contributed to the development of collective memory record and to which parameters or themes. From the table, it is known that some aspects of urban quality have not been written such as ground treatment and furnishing, expressive quality of spatial form, exposure and enclosure, and building skyline and visual continuity. This opens an opportunity for other participants to continuously develop the collective memory records in a particular topic. The accumulation of such information related to buildings and places in the repository will benefit students in understanding historical contextual issues. Furthermore by classifying the content in such parameter, the result might show how the urban quality in the past is remembered.

Figure 3
Content recorded in collective memory and design proposal
(a) word frequency appeared in the collective memory records and design proposals
(b).

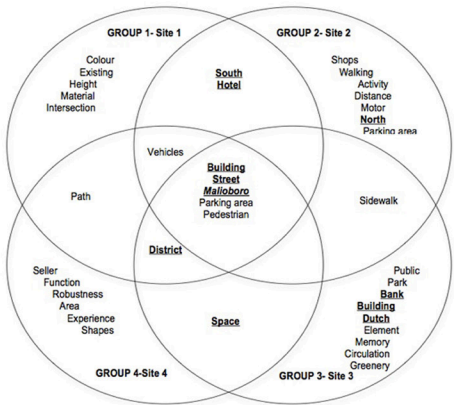


Content of collective memory records for supporting urban analysis

Using the same parameters of urban quality, we investigated whether this content of collective memory composed from individual members of a group have contributed to the development of a group’s design proposal.

Figure 3a revealed that content in collective memory has contributed to the content in design proposal regardless the number of content recorded. However, the table also shows that there is collective memory content i.e. optical viewpoint/serial vision, which students didn’t use at all as an idea to generate/develop their proposed design. This might generate questions whether students are not aware, ignored, or might think that it is not particularly related to their intended proposal. Further study is needed to discuss the circumstances.

Using a frequency word inquiry, we also looked into the content records from both students’ individual task and group’s design proposal to find what kind of topic or idea has the students mainly discussed [Figure 3b]. Initially we explored the frequency word used by each group in their design proposal as the group worked at the different sites. We mapped these findings and found that a word can be proposed either only in a particular group/site, simultaneously used by two or three groups, or



used by all groups. Frequency words such as building, street, Malioboro, parking area and pedestrian are the primarily words used by all group, of which the three former words are founded in the collective memory records too. Using the frequency words, historical contextual issues might be able to be triggered either in a specific site or in a wider location.

From observations on the final outcome, content of collective memory might contribute a significant influence on the quality of design proposals. Figure 4 shows that the highest average of final mark was achieved by group 4 which having the highest number of collective memory records. It could be understood that the more historical information collected, the more students become knowledge about contextual issues. From the tutor's feedback, collective memory is very beneficial for students at the analysis stage as students can compare the past and existing condition, so as it could help students to determine what the next development will look alike.

Visual references for developing design tasks

Among many format of collective memory records, students expressed that picture or photo is the most favourite one. Some photos have been used several times by students in their records. Sometimes the photos were not pointed directly to the site's location, but described the district in general. Several photographs show the building's facades in a historical time sequence.

In design process point of view, the photos gathered in the collective memory repository can be connected as visual references for the group's design [Figure 5].

CONCLUSION

Collective memory enhanced virtual city seems promising to support students in urban design learning. Besides facilitating students to engage more with urban sites by developing the content

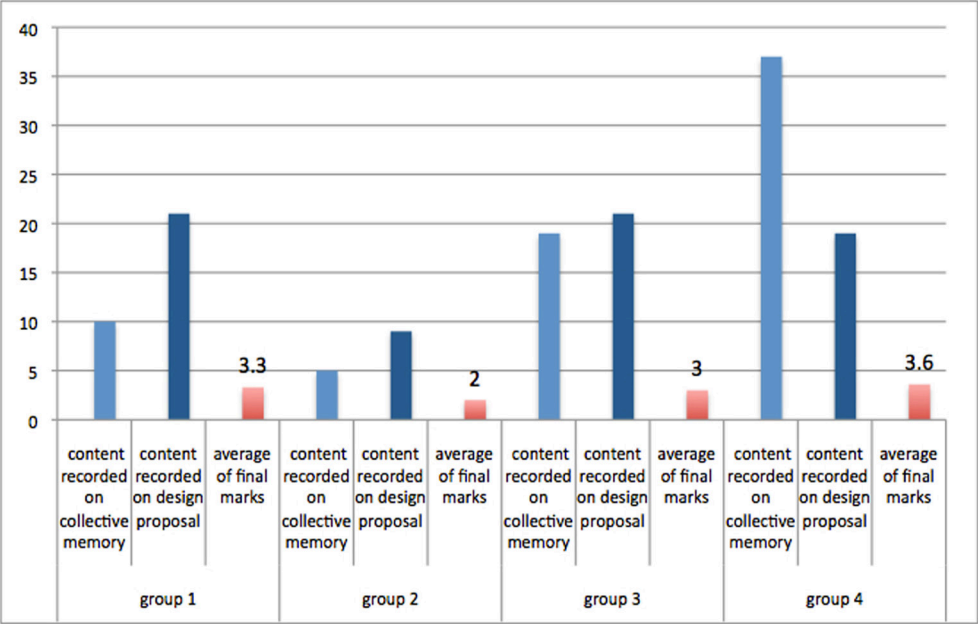
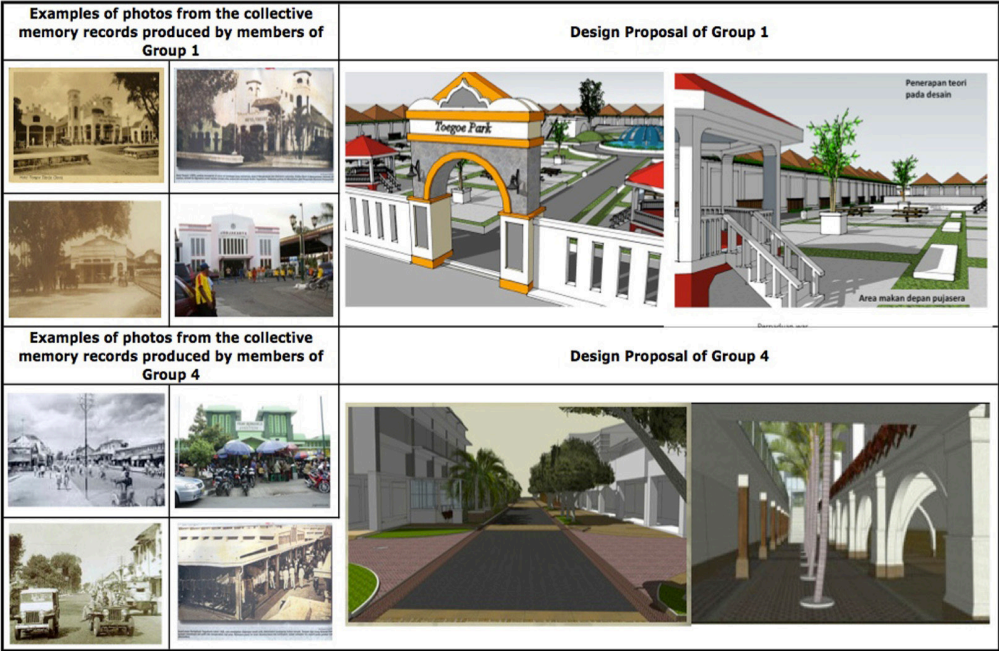


Figure 4
Content recorded in collective memory and in design proposal and average of final marks achieved by students in each group.

Figure 5
 Examples of photos from the record and design proposal (Source: assignments submitted by students for Urban Design Module, Spring semester 2011).



online, the continuation of the content growth can be extended to future semesters for new student participants. The richness of the digital collective memory records contributed by others can help students to understand the importance of urban spaces as emphasized in the course’s learning objectives.

In terms of urban design learning, the CREATI approach can help students at the site analysis stage, as students become more knowledgeable of historical contextual issues. Students can also explore the general ideas for proposing a new design from the frequently words used in the content records.

However, our current structure of the collective memory repository could be further developed to facilitate organizing memory records in a wider and more complex area or region. More advanced features with better graphical interfaces are required to support students’ communication and interaction while developing urban design proposals.

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[1] <http://www.thepeoplesarchive.org/#/Home/HomeView>.