

THE ACTING ROLES MODEL OF WEB-BASED LEARNING

Web-based Architectural Learning Environment (WALE)

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Abstract. Some useful aspects are learned on the asynchrony characteristics of Web and a crucial exhibiting space so-called *gallery* composed by students' creation proposes a positive virtual learning space. In this paper, an acting role-interplayed system (*WALE*) is demonstrated through a CAD subject for third-year architectural students at Ming Chuan University will reveal and evaluate the potential or drawback of such environment. *WALE* is based on a game-playing learning environment for students to interact motivated and to evolve the design potential of individual. This study of *WALE* is facilitated with CAD tools and developed to help students to explore possible design alternatives by acting multi-role in the process of design.

1. Background

Several institutions unfold the possibilities of teaching and cooperating in Web-based learning environment based upon the benefits of its dynamic interaction and a/synchronic behaviors, especially for the purpose of enhancing students' 3D design thinking in terms of forms and spaces.

There have been virtual design studios (Chen et al. 1994, Bradford et al. 1994) designed successfully and demonstrated the interesting outcomes of students' computational skill, technique and knowledge as well as communication (Bridges and Charitos, 1997, Maher et al. 1999, Ando et al. 1998). Without fully understanding the interactive model, students simply perform in a single role—design input and outcomes display in most of virtual design studios. The behavior model of interaction and direct graphic communication among participants of studio such as students, tutors, critics and markers are not yet well understood. Analyzing the idea of design as a reflective action (Schon, 1983) of a game playing, an acting role model is derived from software engineering technique (Jacobson et al. 1992). A system called *Web-based Architectural Learning Environment (WALE)* is created as

the prototype to understand the significance of acting role-interplay model for students in Web-based learning environment.

2. Characteristics

Several useful characteristics of digital architectural subjects on web are learned from various experiences (Woodbury and Chang, 1997; Radford, 1997). There are five primary characteristics of the web-based learning aspects are concluded that the proposed acting role model of WALE are built on top of. They are

- 1) Asynchrony;
- 2) Dynamic Interaction/immediate feedback;
- 3) Multi-role interplay, including One-one, one-many, many-one and many-many relationships;
- 4) Recording/ history;
- 5) Game playing.

Despite that synchrony is a useful feature of web; asynchrony characteristic of design behavior provides a more flexible design outcomes by shifting the design ideas input on web. Web offers an enormous virtual space where information is accessed and exchanged freely and fast. Thus, the features of dynamic interaction/immediate feedback are derived. The concept of multi-role proposed for students is to offer an opportunity of acting different proposition to extend their perspective views of design on web where anything is possible. The features of recording the design process (Huang, Chang and Radford 2000) and playing as a reflective action are two crucial aspects toward web-based learning.

3. Acting Roles

With these characteristics, an acting role model of *gallery* space is shown in Figure 1. Briefly speaking, an acting role model describes a set of certain interaction behaviors toward building up the gallery. For example, the interaction model of *grader* contains the assessment of gallery and request of the grading-related information. Each member (defined as an actor in a play) might play more than one role in participating a gallery, and each gallery might have multiple actors. Six acting roles are defined:

- 1) participant
- 2) grader
- 3) critic
- 4) observer
- 5) guider and

6) administrator.

The role of participants is to participate the act of responding (digital work) for all computational-related design problems. The role of graders is to evaluate the answers by giving a numerical grade. The role of critics is to give each answer either texture feedback or visual feedback. The roles of observer and administrator are two additional roles for visitors and manager of gallery. The guider thus provides the structure of gallery and guiding information for members (participant, grader and critic) of gallery.

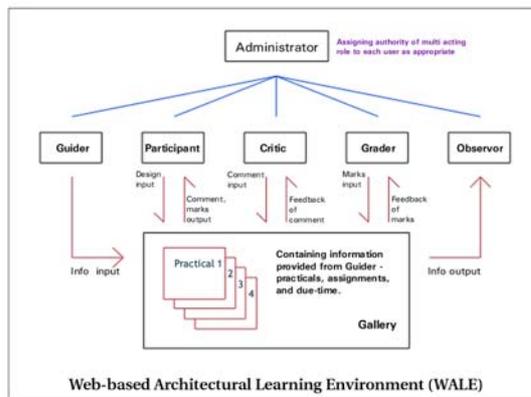


Figure 1. Acting role model diagrams

Furthermore, individuals perform multi-role tasks in which the administrator assigns these roles to each actor and the guider specifies the structure of gallery. The interplay between each role occurs mostly within the three main roles: participant, grader and critic. For example, a participant might not only participate in building up a gallery, but also performs as a critic for other gallery. In addition, a critic might not be a grader, but a grader will never be a participant within the same gallery. However, the existence of being a grader as well as a participant only occurs under in different gallery. Figure 2 shows WALE interfaces while performing certain task for a role.



Figure 2 Different actors has different multi-role list

4. Learned Lessons and future work

As the passive characteristic of WALE, the computing environment becomes a background or a device for learning. Thus, the behaviors of different roles in such studio-like learning environment become more palpable under the spotlight. Some of involved participants in this experimental project (as shown in Figure 3 left) are totally novice in concepts of computing skill and digital media at the beginning. The demonstrated outcomes (as shown in Figure right) when they reach the end of the project are quite interesting. The learning process benefited from such environment is also significant.

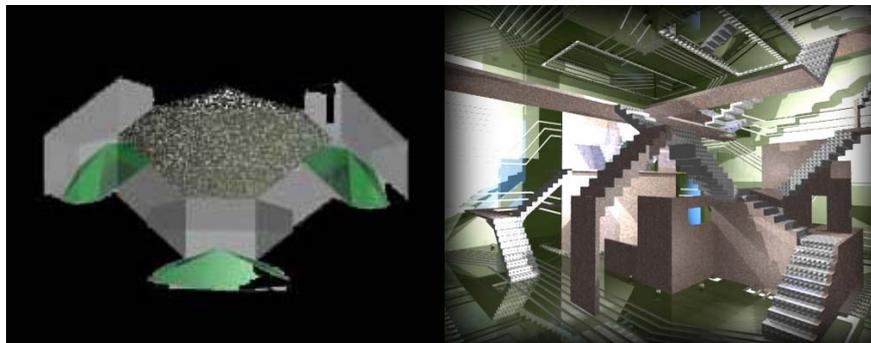


Figure 3. The outcomes of one learning process (left: start; right: the end)

The study of acting role model proposes an understanding of multi-roles-interplaying model of web-based learning and provides a common ground for studying the last two characteristics: playing and recording of design. Such game-playing environment by using web as a client server for multi-role services and synchronizing the repository of design information data provides a dynamic design co-respondent and interaction. Furthermore, such open design learning environment is particularly useful and demand to help students explore possible alternative designs by participating as well as observing their own process of design.

References

- Ando, H., Kubota, A and Kiriyama, T.: 1998, Study on the collaborative design process over the internet: A case study on VRML 2.0 specification design. *Design Studies*, **19**, 289-308.
- Bradford, J.W., Cheng, N. and Kvan, T.: 1994, Virtual design studios, *The Virtual Studio: Proceedings of the 12th European Conference on Education in Computer Aided Architectural Design*, pp. 163-167
- Bridges, A. and Charitos, D.: 1997, On Architectural design in virtual environments, *Design Studies*, **18**, 143-153.

- Chen, N., Kvan, T., Wojtowicz, J., Bakergem, D., Casaus, T., Davidson, J., Fargas, J., Hubbell, K., Mitchell, W., Nagakura, T. and Papazian, P.: 1994, Place, time and the virtual design studio, *Reconnecting: ACADIA Conference Proceedings*, pp. 115-132
- Huang, J.H.-L., Chang, T-W. and Radford, A.: 2000, A derivation graph of computer models for the design process on the web, *CAADRIA 2000*, pp. 307-316
- Jacobson, I. et al.: 1992, *Object-Oriented Software Engineering: A Use Case Driven Approach*, ACM Press, Addison-Wesley Publishers.
- Maher, M. L., Skow, B. and Cicognani, A.: 1999, Designing the virtual campus, *Design Studies*, **20**, 319-342.
- Radford A.: 1997, Games and learning about form in architecture, challenges of the future, *15th eCAADe Conference Proceedings*.
- Schon D.: 1983, *The Reflective Practitioner: How Professionals Think in Action*, Basic Books, New York.
- Woodbury, R. F. and Chang, T.-W.: 1997, Using the WWW for design teaching, in Y-T. Liu, (ed.), *CAADRIA*, Vol 2, pp.465-474.