

Real-time Collaboration Systems and Design Studio Education

An evaluation of equivalence between on-site and distance learning

Neander Silva, Ecilamar Lima

Faculdade de Arquitetura e Urbanismo, Universidade de Brasília, Brasil

(<http://lecomp.fau.unb.br/epaac>)

Abstract. *Many papers have been published about real-time collaboration systems in architecture. These, however, do not tackle the issue of how these systems may affect the learning process. This paper seeks to show that these systems improve participation in design discussions.*

Keywords. *CAAD, education, real-time collaboration systems.*

Introduction

Research into the field of distance learning in Architecture is at an incipient stage. The main gap concerns the introduction of teaching into the design studio, where face to face activities are regarded as essential. Teachers and students need to meet, and simultaneously see, visualise, manipulate, and discuss the artefacts being designed.

The real-time collaboration systems, RTCS, have the potential of replacing on-site design studio activities. Most of the published work in collaborative design involves system evaluation and specification (Lonsing, 2003). However, reports on how much RTCS provide a learning environment in teaching architectural design that is equivalent, or how they compete favourably with on-site learning, are few and far between. Likewise, there are no accounts on how the use of this new technology changes the teaching and learning methods in architecture.

Equivalence

Keegan (1995) and Simonson et al (2000) regarded equivalence to on-site education as the key criteria to assess the success of distance learning. This would be reflected in the results. Ko and Rossen (2001) consider that an on-line synchronous course can compete favourably with the traditional one.

In this paper we describe the initial steps of an experiment, in which we compared the results of teaching CAAD using real-time collaboration systems, these were compared with the results of developing the same activities and delivering the same contents on-site. The final objective of this research was to compare two groups of students. Each sample group was to be taught the same course contents. The first group would be taught and supervised on site. The second group was to be taught and supervised through RTCS.

In this paper we describe the initial results from the first phase of this research, which is focused

on the level of students participation in group activities, particularly group discussions.

For the purposes of this initial phase, data from three on-line discussion meetings was gathered and analysed. These discussions were held within the framework of a Computer-Aided Architectural Design post-grad diploma course offered at our School. This program is partially based on problem-based learning and has already been the subject of earlier publications (Silva, 2001a, 2001b).

The key issue at this stage was to verify the on-line meetings were resulting in more, or less, participation from the students in relation to the on-site meetings.

The first conclusion reached was that the on-line meetings actually resulted in higher levels of participation than the on-site ones. In our traditional on-site programs, participation does not result in interaction from all the students. In fact the rate of interaction from the students is low: ranging from 10% to 30% of the students actively participating in the discussions.

On the other hand, during the on-line meetings we have monitored, the percentage of students taking part was very high: only one out of 14 did not interact with the group. This represents a rate of 93%, of students who actively participating in the discussions.

Figure 1 shows the percentage of participation for each student in the sample in relation to the total level of interaction during the on-line meetings. At this stage, for the purpose of this research, we considered each question, answer or comment from a student as being one “interaction”.

The graph above reflects a substantial variation in the level of participation. We would like to point that despite the low level of participation on our on-site discussions almost all students took part in the on-line discussions.

Figure 2 shows the percentage of students as bands of total interactions. In other words, band 1 on the x-axis of the graph below represents students that never participated. Band 2 represents

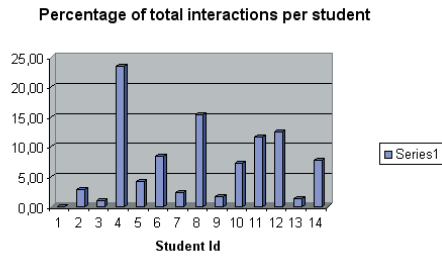


Figure 1. Percentage of total interactions per student.

students that participated contributing to up to 10% of the total interactions. Band 3 represents students that participated contributing from 11 to 20% of the total interactions. Band 4 represents students that participated contributing from 21 to 40% of the total interactions. Band 5 represents students that participated contributing from 41 to 60% of the total interactions. Band 6 represents students that participated contributing with more than 60% of the total interactions. The three different series in figure 2 represent the three different online meetings from which we gathered information for our analysis.

The graph below is important as it describes a reasonable distribution of students within the described bands and a healthy concentration in the middle ground bands, with fewer students at the lower levels, reflecting low participation, and also fewer students at the top levels reflecting an excessive monopolising participation.

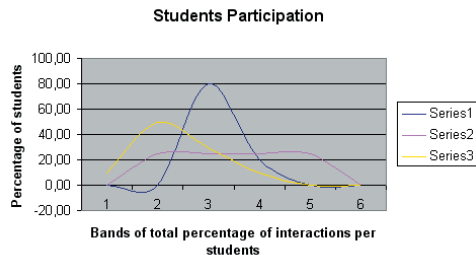


Figure 2. Students participation.

Conclusions

We acknowledge that it is premature to carry out a full analysis of the results however, they are promising ones. The level of participation was significantly higher during the on-line meetings than in the on-site ones. We are now of the belief that equivalence may not be the necessary or even the appropriate criteria for measuring the success of distance learning, be it in architectural education, or for that matter in other fields.

A number of different factors may contribute to the above results. Among them the fact that on-line meetings seem to provide a more private environment for people who would otherwise prefer to remain silent.

We agree with Ko and Rossen (2001) when they state that an on-line synchronous course can compete favourably with the traditional ones.

We will seek to verify in the next phases of our research how much equivalent or even how the learning experience has improved, and how to answer a number of specific questions: Does RTCS facilitate the holding of more than one topic section simultaneously? What is the impact of recording and replaying tutoring sections on the outcomes? Does the increased participation contribute to a better learning of computer-aided architectural design? How does it change the learning process?

The results show that there is still a gap, reflected in regarding small delays and the need for different meeting techniques to be developed. However, The results are nonetheless promising.

References

- Keegan, D. (1995) Distance education technology for the new millennium: Compressed video teaching. (ERIC Document Reproduction Service number ED 389 931).
- Lonsing, Werner (2003). Collaboration in the independent architectural office. In Dokonal, W. (editor) Digital Design, XXI eCAADe Conference,

Graz, Austria.

Ko, Susan and Rossen, Steven (2001). Teaching Online. A Practical Guide. Houghton Mifflin, Boston, New York.

Simonson, M., Smaldino, S., Albright, M. and Zvacek, S. (2000) Teaching and Learning at a Distance, Foundations of Distance Education, Prentice Hall, Collumbus, Ohio.

Silva, Neander. (2001) The Structure of a CAAD Curriculum and the Nature of Design Process - An Experience Handling Contradictions, em Penttilä, Hannu (editor) Architectural Information Management, analyses 19th International Conference on Education in Computer-Aided Architectural Design in Europe, eCAADe 2001, Helsinki University of Technology, Finlândia, 352-357.

Silva, Neander. (2001) Problem-based Learning in CAAD curriculum: the search for a feasible model, Dumont, Guillermo G. (editor), anal. of V Congresso Ibero-Americano de Gráfica Digital, SIGraDi 2001, Universidad del Bio-Bio, Concepción, Chile, 210-212.