LOW-TECH REMOTE COLLABORATIVE DESIGN STUDIOS

JOSÉ R. KÓS, TEREZA C. MALVEIRA ARAUJO
Faculdade de Arquitetura e Urbanismo.
Universidade Federal do Rio de Janeiro.
josekos@ufrj.br, malveira@terra.com.br

JOSÉ S. CABRAL FILHO, EDUARDO MASCARENHAS SANTOS
Escola de Arquitetura e Urbanismo
Universidade Federal de Minas Gerais.
jcabral@arq.ufmg.br, ems@arq.ufmg.br

AND

MARCELO TRAMONTANO
Departamento de Arquitetura e Urbanismo
Escola de Engenharia de São Carlos
Universidade de São Pauloz.
tramont@sc.usp.br

Abstract. This paper aims to analyze Virtual Design Studios in big countries such as India, China and Brazil with great disparities between the schools of architecture and cultural diversity within their territories. Two VDS experiences with Brazilian institutions form the bases of the paper's arguments. Limitation of equipment, bandwidth or available tools should not impede the organization of collaborative experiences. Instead, they should ground the strategies for the implementation of those experiences. Several free tools that are available on the Internet and which the students were used to, were chosen for the communication between the participants. Limited resources were not an obstacle to gain what we have considered the most important benefit of our experience: the exchange between students and faculty towards the recognition of the other participants' different cultures, traditions and knowledge, allowing a better understanding of their own context.

1. Introduction

For more than a decade, several papers have addressed Virtual Design Studios (VDS) (Wojtowicz et al., 1992 and 1993). Those works discuss a great variety of issues related to group design experiences based on network communications. This paper intends to contribute to the theme introducing issues that can be relevant to CAADRIA members and which are seldom focused upon by other authors. After two experiences with the participation of different Brazilian architecture schools,

we have noted the value of such exercises to countries with broad dimensions, such as India and China, and uneven institutions. Limitation of equipment, bandwidth or available tools should not impede the organization of collaborative experiences. Instead, they should ground the strategies for the implementation of those experiences.

Although this paper focuses on countries such as India, China and Brazil, its contribution should not be restricted to them. They were preferred as focus in this paper because besides their size, they present significant disparities among their academic institutions, reflecting cultural and economic differences of their regions. Diverse economic resources, cultural backgrounds and design cultures create a rich environment for student and faculty exchange in one country. In addition, similitude of language, academic calendar and time zone facilitate the organization of remote collaborative studios within the same country. Although a national VDS would suggest fewer contributions towards cultural exchange, it actually offers opportunities for opposed observations. Sharing the same national language and other structural backgrounds facilitates the exposure of the participants when communicating with others. Thus, it also reveals subtleties that are not always evident. The groups learn about their counterparts and also about themselves throughout the process. Students, and also faculty members, realize the different approaches towards a design that each group takes, turning the experience into a powerful tool towards the integration of the schools within the country.

We agree with Susan Yee's statement that "the more interesting reasons for conducting virtual design studios reside in the opportunities they provide for transgressing the boundaries of culture, which results in a reflection of one's own culture, an understanding if another's culture and a construction of a new culture." She continued explaining that for culture she includes "national cultures as well as cultures rooted in design groups, disciplines, professions, and institution" (Yee, 1999). In addition, addressing local cultures in large countries can bring about significant contributions. These contributions are both as a way to identify different cultures and also to integrate institutions and individuals within one country. The pedagogical benefits of such initiatives are evident. Therefore, it is also important to proclaim the possibilities to make it available to a greater number of institutions and countries.

2. The Brazilian context

Brazil has 182 institutions responsible for the education of architects and urbanists. The distribution of those institutions is very uneven and among the 26 states in the country, only one, São Paulo, houses nearly a third of them (59). The Ministry of Education certifies 85 of those courses in the whole country and their students—4,000 that graduate every year—are entitled to sign architectural documents such

as plans as soon as they leave the university (ABEA). The asymmetry of the institutions is also evident in many aspects such as their economic situation or the students' culture. The most recognized institutions are chosen by students from other states, but even those have the majority of their students coming from their area. The students—and also the instructors—from each institution usually represent the culture of their area. Therefore the diversity of cultures verified in such a big country is similarly noticed in the institutions located in different states.

Although Information Technology is a requirement for the 85 certified institutions' curricula, it is also applied very disproportionately. Most institutions cannot afford computer laboratories to attend adequately to their students. In addition, their staff is seldom prepared to introduce the technological resources currently available for the professionals. While few schools of architecture have their own specific laboratory structured to support design studios, a great number has to share general computer laboratories with various courses within the university. On the other side, a great number of students work at home with their own desktop computer. The asymmetry is also verified here in the diversity of hardware capacity or Internet connection bandwidth.

Most Brazilian students participate in some design studios working with teams during their architecture course. In Rio de Janeiro, for example, the students work mostly at home due to lack of space in the studios at the university or because of the distance between their home and the university. Therefore, when working in teams, a significant part of the design process is developed within their own homes. They discuss among themselves over chat lines connections using standard programs such as *MSN Messenger* or *ICQ*. They exchange files using those programs or through e-mails. The use of the Internet to communicate is spread over Brazilian students. Likewise, many students are used to play games over the Internet while simultaneously contacting some of the players through *MSN Messenger*. If one enters in a computer lab at the university, will see on the computer screens where students are working several tasks running at once: usually at least a webmail and a chat program. This multiple, simultaneous and intensive use of a variety of applications is probably a typical situation of every school computer lab. However, in Brazil, another factor contributes to the enhancement of such a scenario: the widespread use of pirated software. Despite the current efforts of the government to penalize it, the easy access to all kinds of applications has led to highly skilled and versatile students. To keep this diversity in a legal scenario, it would be important to consider the extensive adoption of free software.

Regarding the current pervasiveness of Information and Communication Technology, Brazil has a peculiar situation: it takes part in this global trend (for instance, housing the world's largest *Orkut* online community—www.orkut.com) and at the same time it still has very poor areas, which are completely cut off from these resources. Such a disparity happens locally within large cities and also between the different regions of the country. This unevenness ended up as a visible factor

in our VDS experience and had to be taken into consideration. There is also a meaningful contrast in the design culture throughout the country due to climate variations, availability of building materials, cultural background tinted by different races and immigrants and several other aspects. Bridging these and other cultural gaps should be one of the most important roles of VDS in similar countries.

There are specific traits in Brazilian culture that are essential if one wants to design an experiment that profits from the national peculiarities: (i) informality, which displaces the usual hierarchy of teaching institutions; (ii) the fluidity of social communication, where new trends spread rapidly through casual paths, running alternatively to the mainstream media, based merely in proximity, working in a sort of viral contamination; (iii) *antropofagia*: a Brazilian way of absorbing external influences, a cultural kind of anthropophagy, which refers to the old native indians' custom of eating their enemies to absorb their best qualities. In this way, as Baudrillard has said, Brazilians "offer a lethal hospitality to values that are not and never will be theirs" (Baudrillard, 1993). Curiously, such traits are very akin to the truly innovative aspects of the ICT revolution: rhizomatic structure, connectivity, peer-to-peer, etc.

A VDS with participants from the same country does not prevent the feeling of being a stranger to other participants. That feeling can be brought on by linguistic variations on national languages such as dialects or even different languages. In the Brazilian case, the Portuguese language is common to the whole country. However, the Brazilian variation of the Portuguese from Portugal ended up assimilating words and expressions from African slaves and Brazilian native indians. Even though it does not constitute proper dialects, the regional differences in the language are enough to bring some noise in the communication between people from different areas, especially in oral interaction.

On the other side, working in every participant's own language is a significant issue. The particularities of each region may be evident for their partners from other regions in the same country. However, they would hardly be noticed by a participant communicating through a second language. The recognition of cultural nuances is much easier in that condition and cannot be disregarded when evaluating those experiences. It is also a meaningful aspect as a movement of integration of the different areas within the country. Countries such as India or China have more pronounced differences among their regions with more language distinctions. However, the unifying language is also powerful to distinguish and understand those differences.

3. Sharing experiences with different groups

Carlos Skliar (2003) states that we always represent the *other* in opposition to us, identifying, classifying, and naming that other person. If the *other* is a foreigner,

that makes us a citizen, if the *other* is abnormal, that makes us normal, if the *other* is an excluded, that make us an included. He suggests we should "look well", to leave our arrogance aside, to stop for a moment to compare ourselves with the others and to look inside; to consider the other, not as our rival or opponent, but just as another human being, giving us the freedom to be ourselves while allowing the other to be himself or herself; in summary, to search for the essence of the human. "To look well, which means, to turn the eye more to literature than to dictionaries, more to faces than to pronounces, more to the unnamed than to the named. And keep being careless, dislocated and surprised, to stop believing that our time, our space, our culture, our language, our sameness, means, all times, all spaces, all cultures, all languages, all humanity" (Skliar, 2003).

During the previous decade, academic exchange has increased, allowing students from one institution to go to another institution for a period of time and live within another culture, sharing their doubts and their certainties, in summary, being in contact with the "other". The new communication and information technologies allow the proximity of different groups, giving them the opportunity to know other cultures, without physically crossing borders.

Based on her experiences with VDS, Susan Yee (1999) realizes that the contact between students and teachers from different academic environments stimulates the exchange of personal experiences, cultures, knowledge and feelings related to architecture and urbanism and methodologies of design projects. The dialogue with the *other* contributes to the understanding and the acceptance of their differences, collaborating with the practice of the negotiation. In that sense, those activities go beyond the limits of a simple academic exercise, allowing a rich experience to the student and creating a new kind of academic exchange, a virtual exchange.

Searching for pedagogical theories that would serve as a basis for the VDS, we will find among researches of CSCL (Computer Support Collaborative Learning), where we include the VDS experiences, the previous theories of the Russian psychologist Lev Vygotsky. His research focused on relations between learning and social environments and on interactions between peers as a motor for the individual development. Although his work was devoted to the learning process of children, his theories have a parallel with the modern techniques of Collaborative Learning (Almeida, 2003; Andrade, 2003; Blank, 2000; Medeiros et al., 2003).

The importance of the *other* to the comprehension of new problems was highlighted by Vygotsky who created the term, *Zone of Proximal Development*, describing it as "the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978 as quoted by Riddle, 1999). Which means, that a person will better solve a problem with the help of the others than alone, reinforcing the idea of the importance of a collaborative environment for the learning process.

Isaia understands collaboration as extremely important to the development of

the students; she believes that the differences of understanding between students enrich the learning process: "[...] it's very important that teachers create space for dialogue and argumentation towards the cognitive production of the students. This space is possible even when, in terms of knowledge and appropriation strategies, the relation teacher–student, student–student is uneven. It's exactly the diversity and the heterogeneity that enriches the interpersonal exchange, generating development leap, implemented by the dynamism between the actual and the potential development" (Isaia, 1998).

In a moment when individuals seem to realize their incapacity to live alone and that their attitudes have global consequences, it seems logical that Vygotsky's ideas of interaction and collaboration have spread, even seventy years after his death.

The development of architectural designs through VDS gives a great opportunity for students to contact students and teachers with different cultural and social characteristics, crossing the limits of an academic exercise and entering into the social interaction zone. In times when the world seems smaller every day, it's important to encourage academic exchange that provides cooperative work among groups with different ideas, stimulating collaboration, understanding, tolerance and respect for the diversity. The contact with different cultures, languages, beliefes, and convictions bridges students with other societies, giving them a new perspective to the unknown.

4. The organization of low-tech VDS

The reflections presented in this paper originated from the organization of two didactic experiences of VDS developed with Brazilian schools of architecture. The first exercise (Tramontano et al., 2004) involved 64 students and 10 faculty members from 6 schools at the Federal Universities of Rio Grande do Norte, Minas Gerais, Rio de Janeiro and Rio Grande do Sul, the State University of São Paulo in São Carlos and the University of Uberaba. A smaller group took part of the second exercise with students from the Federal Universities of Minas Gerais and Rio de Janeiro and faculty members from those two institutions and from the University of São Paulo at São Carlos. Both exercises were directed towards a practical experience and did not aim to produce statistics of communications between the participants or of analysis comparing traditional studios and VDS. The main objective was to stimulate the communication between the participants and the exchange of information between the groups of the different institutions.

Both experiences lasted a whole semester based on elective courses parallel to the main design studios, with few hours during the week. Thus the students did not devote most of their time during the semester towards those projects. The student should design a social housing project in sites located in downtown of each city in the first exercise or in the city of the institution that did not have any student in the

Figure 1. Home page of the first VDS developed with 6 institutions and 64 students.

second exercise. One of the requirements was that the students should investigate new directions of social housing in the centre of the cities.

Elaborating a remote studio in such conditions should foster an integration of the participants around a design problem, stimulating different sort of exchanges much beyond the design problem itself. Our experience confirmed the observation of Thomas Kvan that the students adapt to the modes of communications and the available tools and that computer-supported collaborative design should not "rely on tools which seek to replicate face-to-face design context" (Kvan, 1999). The effort was not towards introducing tools for the students, but adapting the exercise and the communication to tools familiar to most students. The intrinsic characteristics of the communication modes are explored in order to accomplish their task. During that search, new forms of communication are brought forth. The limitations of bandwidth or the tools resources should not be seen as an impediment if their aim is not replicating the traditional communication of a team design process. Sometimes the typical group leader is supplanted by individuals who find creative and effective ways to communicate their argument.

The tools for those exercises should be simple, easy to use and accessible to all participants. Today, there are several tools available, with free access through the Internet, which are sometimes more powerful than those utilized in the early 1990s. Furthermore, since many students apply several of those tools in their leisure time, they are already used to communicate among themselves through both synchronous and asynchronous tools, such as emails, chat software, P2P telephony,

webcams and existing websites for sharing information. The decision to base the collaborative exercise mainly with those tools facilitates the access of students from institutions with different resources and also from their own home. Videoconferencing with a white-board, for example, can be a powerful resource for group communication, but also prohibitive for many institutions in several countries. Simpler systems or methods, although less dynamic, can substitute it, even for larger reviews. Thus, it's critical for the organization of those VDS to define trustable, accessible and easy-to-use tools for communication and file repository.

Free chat programs were the main form of synchronous communication and email the asynchronous. *MSN Messenger* was the standard software for communication inside the groups and also for discussions or reviews with more participants. The students were asked to save every discussion and place it in the main repository of the group, which could be a webpage or a page of other systems used in the experience. As Kvan (1999) also noted, the text communication were very powerful. The students needed to constantly clarify their design concepts in order to expose them and they could always return to the previous discussion in order to base their arguments. The teachers could also verify the design process through these stored discussions. Webcams and audio tools were used but mostly as a tool to know more about each group and not for exchanging ideas. The free online telephony system *Skype* (www.skype.com) is a powerful tool. It was used for the discussion organized by the faculty members or casual talks with the groups. Students could recognize the groups by the regional accent and know more about their partners' voice. However, the conversations could not be stored and some of the participants did not have a microphone, particularly the students working at home. Basic video conferences with webcams and projectors were similarly useful for knowing the people and the space they were working but seldom used for discussions and reviews. Everybody had access to *MSN Messenger* and even those who could not access from home or from the university, sometimes participated in discussions from Internet cafes. Therefore, the most available tool became the standard for every synchronous communication.

A specific tool designed for general collaborative projects—*Lotus Quick Place*—was used in both exercises to centralize information. In the first experience, we noticed that students used more often their own emails to post information than that program. In the second exercise, we suggested two different systems: the *Lotus Quick Place* and an online system to post information to a network of "friends": *Multiply* (www.multiply.com). We were somehow surprised that the students replaced *Lotus Quick Place* with *Multiply* for posting messages, images and comments. Even for reviews, that tool was the core of information about each project. *Multiply* is an open system where people can find other members they know and build a network of friends sharing information and files to your friends and their friends. Although the page for the course was limited to the course participants, the

students' page were not—unless they wanted it to be. Thus, some groups received comments in their pages from architects or students who did not take part in the exercise.

Figure 1. A *Multiply* page of one of the students (Andressa Martinez, 2004).

Another similar system of online community, the *Orkut*, was also used by the students. It offers fewer resources than *Multiply*, but since it was more popular among the students, it was useful for knowing more about their group partners.

In addition to Quick Place and *Multiply*, some groups developed their own webpages for the group's project. Some of them were highly elaborated pages. The course webpage had the directions for each group's repository and although the projects were placed in different formats and places, it was not difficult to find them. The variety of the groups was also exhibited in the formats they chose to communicate their projects and ideas.

5. Conclusion

The first experience developed with six universities and 64 students was surely richer. However, similarly to other experiences with such number of participants, it was often confusing and the organization was quite difficult to manage (Bradford

et al., 1994). We noticed that most students and even faculty members could not access information from every group. The reviews had to be split in small groups of students and faculty. The frequent discussions about the project's theme were always very crowded with some parallel discussions. However, the theme of social housing in the centre of the cities was very interesting to raise different local traditions and approaches. During those discussions, the participants were exchanging image files from their cities or from other projects or links to webpages.

We have noticed that these discussions were one of the worthwhile activities for most participants. Brazilian universities, particularly those that are not in the main towns, cannot afford to have visiting critics or lecturers coming from other locations. Thus, those collaborative exercises were particularly profitable to smaller schools far from the main centres. The course acted as a big open studio and some students continued searching for the faculty members from the other universities even after the course was over. The meaningful faculty exchange, which richer or recognized institutions can afford, could be shared with institutions with less resource. There was no specific budget allocated for that experience in any of the participant institutions. We have concluded that the technology limitations demanded more effort by the participants. However, it was highly compensated by the exchange established in an unbalanced context where restricted resources prevail.

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