



Virtual Studio Pilot Project

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Athabasca University

RAIC Centre for Architecture





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Figure 1: RAIC 200, Primal Habitat (Student: Anja Djogovic)

I. INTRODUCTION AND OVERVIEW

The design studio is the cornerstone of an architect's education. Typically these studios are taught in a face to face environment but developments in telecommunications are enabling new possibilities for learning about design.

In February of 2015, the RAIC Centre for Architecture at Athabasca University, in collaboration with the Royal Architectural Institute of Canada (RAIC), embarked on a pilot project to test the idea of a virtual studio. The objectives of this pilot were to answer the following questions:

1. Is it practical and feasible to teach design virtually?
2. Is the work produced comparable in quality to that of a face to face studio?
3. Is the student experience as good as that of a face to face studio?
4. Can you build an online community of practice?

The Centre serves both general interest students completing a Bachelor of Science in Architecture and those in the Royal Architectural Institute of Canada's Syllabus program. The Syllabus combines face to face studios with work experience and online courses to allow working professionals to attain the prerequisites to become licensed architects. The pilot project included both general interest and Syllabus students. Most of the general interest and Syllabus students work during the day so it was important to hold these studios in the evening.

The pilot included 6 students: 2 from Edmonton; 3 from Calgary; and 1 from Mont-Tremblant, Quebec. Two of them were Syllabus students and four were in the general interest stream. 1 student was in RAIC 200, Foundations of Design I; 4 students were in RAIC 300, Foundations of Design II; and 1 student was in RAIC 400, Foundations of Architectural Design, Collective Habitat.

The studio was led by Coordinator Cynthia Dovell, Director of LGA West with assistance from Bobby Harris, Syllabus Student and BIM Manager with Dub Architects. It was also supported by Centre staff: Student Advisor, Emma Lowry, Program Administrator, Carole Mason, Associate Professor Dr. Ashraf Hendy and Chair, Dr. Douglas MacLeod.

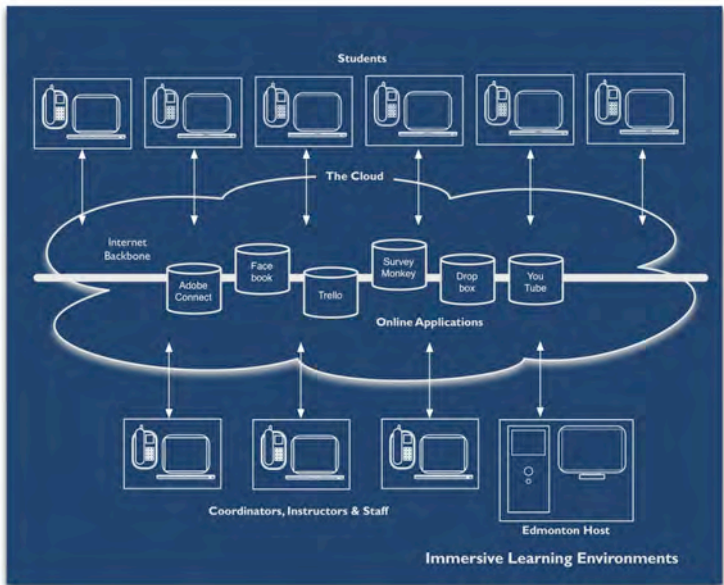


Figure 2: Schematic of Virtual Studio Pilot Project

2. INFRASTRUCTURE

The intent was to create a platform for virtual design that was economical but effective. In every instance an attempt was made to use off-the-shelf and freely available software.

To this end, the Centre created a platform with the following components:

- Adobe Connect for videoconferencing and the presentation of design work
- A teleconference line to ensure high quality audio
- Dropbox to submit assignments
- Trello – a project collaboration and management web-based application
- YouTube for sharing videos
- Survey Monkey to evaluate the student experience

Each participating student also required a computer with an Internet connection and a webcam and a phone line. At various times tablets were also used to connect to the system.

This infrastructure is summarized in Figure 2.

Before the studio began, a Facebook page was also created but the students felt it was not a good means of organizing information and so a “Virtual Studio” project page was created in Trello. Trello is structured around a descending hierarchy of Boards, Lists and Cards. Boards were created for “General Resources and Information” and “Weekly Work.” On the “General Resources and Information” board there were lists for “Weekly Agendas,” “Course Information” and “References and Links.” See Figure 3.

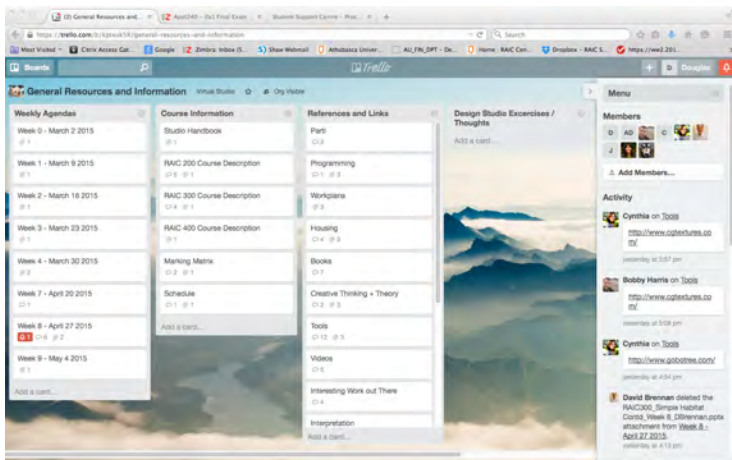


Figure 3: Trello as configured for the Virtual Studio

Since Athabasca University already had the Adobe Connect system and the toll free telephone lines in place, the only cost in terms of software was to secure an upgraded copy of Survey Monkey. It should be noted that there was no cost to the students to use any of the software packages listed above. Moreover, all of these components are easily accessible to students all over the globe.

The studio met on Monday nights from 5 pm to 8 pm Mountain Time for 13 sessions beginning on February 23rd, 2015. Each session included:

- A short presentation by each student on their current work
- An assigned reading for the next week
- A discussion/presentation on a relevant topic (such as the assigned reading)
- An introduction to the problem for the following week

The virtual studio met on the same day at around the same time as the face to face studio of the Edmonton chapter of the Syllabus program and followed exactly the same curriculum as

that provided by the RAIC. Students from both the virtual and face to face studios presented together (some in person and some online) at both the Midterm and Final Reviews held on April 13th and May 25th respectively. During each review, all students were asked to present for 10 minutes and then they received 10 minutes of feedback from the critics who were both in the presentation room and online.

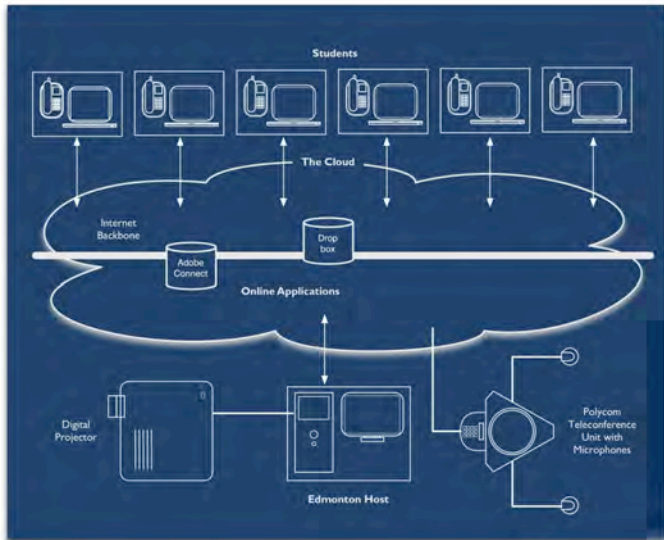


Figure 4: Schematic of Virtual Studio Presentation Mode

Having the face to face studio as a control group was an important component in evaluating the experience of the virtual studio. In addition, the students in the virtual studio were asked to complete 3 surveys during the studio.

An initial survey was completed within the first week in order to gain an understanding of their previous technical and educational experiences. A second survey was sent out after students received their marks from the Midterm presentations in order to gain an understanding of whether or not issues or problems had occurred. The Final Survey was sent out after the Final Reviews to determine the success or failure of the

technology, teaching methods and student/coordinator interactions.

In this context, the results of the pilot can be assessed against the objectives, each of which is discussed in more detail below:

- Practicality and Feasibility
- Quality of the Work
- Quality of the Student Experience
- Building a Community of Practice

3. PRACTICALITY & FEASIBILITY

In general, all components of the platform worked well with only minor trouble shooting required.

Adobe Connect provided a robust videoconferencing system although it did freeze upon occasion. It was, however, able to accommodate 10 people at a time with their webcams. When presenting, students shared their screens with the others or uploaded files (including short animations) into the system. Adobe Connect also had rudimentary tools for drawing on the screen. One student noted that feedback was better in a face to face situation where a mentor or instructor could draw overtop of their design with a piece of tracing paper (see below for a more detailed discussion of this issue).

Good audio is essential to virtual communications and most videoconferencing systems are plagued by poor quality audio. For this reason a teleconference line was used for all sessions and the participants muted the microphones on their laptops.

Presentations, however, were more difficult since virtual students would present to a room of people in Edmonton. At the Midterm presentations it was difficult for those online to hear some of the critics at the back of the room but this was solved for the Final Reviews by providing additional microphones for the Edmonton room.

Students had no problems using Dropbox to submit assignments or Trello for reviewing or posting course information. No special training was provided in the use of these applications.

Two things should, however, be noted: First, the platform worked well because each component and each configuration was tested and tested again. Adequate time was provided, for example, to upload and test each presentation before the reviews. Second, any studio, face to face or virtual, is only as good as the people in it. This pilot was very fortunate to have dedicated staff and students whose enthusiasm and energy were

During the course of the studio, on one occasion a student dialed in from Iceland and on another a student dialed in using Skype from Loreto, Mexico. There was no noticeable deterioration in the quality of the audio or video connection from Iceland. The connection from Mexico was not as good quality in terms of the audio and the student was logged out every 15 minutes if their keyboard or mouse was not active. These are, however, characteristics of Skype. These unexpected connections provide a further demonstration of the feasibility of the platform.

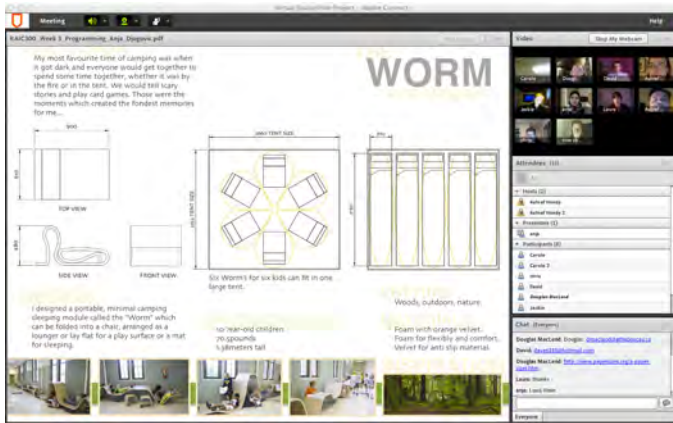


Figure 6: Screen Shot of Student Presentation from Iceland (Student: Anja Djogovic)



Figure 7: Geographic Reach of the Virtual Studio Pilot Project

4. QUALITY OF THE WORK

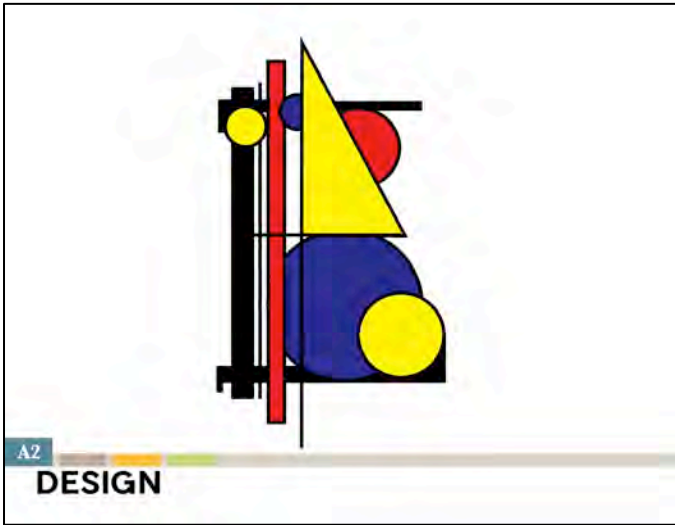


Figure 8: RAIC 200, Logo (Student: Laura Barakeris)



Figure 9: RAIC 300, Primal Habitat (Student: David Brennan)



Figure 10: RAIC 300, Precedent Study (Student: Jaclyn Dancause)

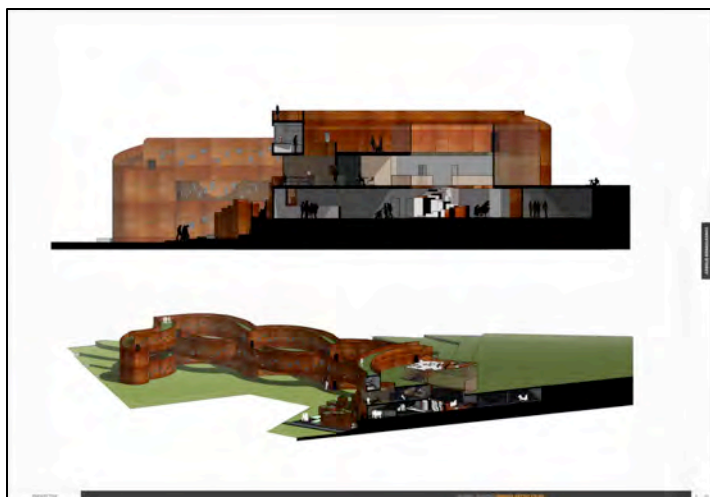


Figure 11: RAIC 400, Section and Perspective (Student: Christopher Storey)

Students in both the virtual and face to face studios used essentially the same tools to create their designs. Hand drawing,

sketching and physical models were emphasized in the earlier studios but all students used digital tools such as SketchUp, Photoshop and PowerPoint.

All students in the virtual studio received a passing grade but there was a range of abilities across both studios but – and this is crucial – the variation in ability was greater within the studios than between them. In other words, the work in both studios was comparable and it appeared that delivering the curriculum virtually did not compromise the quality of the work. In addition, the exposure of students to the work in more advanced studios as demonstrated by the shared reviews helped improve the quality of the work of both groups.

5. QUALITY OF THE STUDENT EXPERIENCE

The Midterm Survey indicated that all the students were “Comfortable” or “Very Comfortable” with the technologies used in the virtual studio. This level of comfort was critical to the quality of the experience. In the Final Survey, however, when asked, about the impact of the various technologies on the studio, many students felt it had a “Moderate” to “Substantial” effect. One student clarified, however, that “I said that they all had substantial effect because I think they were all valuable in order to complete the course effectively. There were a couple of small glitches, but I think that it worked really well.”

In general, the students seemed pleased with the quality of the studio. One noted, “Exceeded my expectations,” while another commented “Overall this was a really good experience.” Another wrote, “I’m most pleasantly surprised of how easy, simple, enjoyable the whole experience has been so far and really hope it continues.”

In the Final Survey, as shown in the figure below, 4 students rated the overall quality of the course as “Exceptional;” 1 rated it “Above Average;” and 1 rated it “Average.”

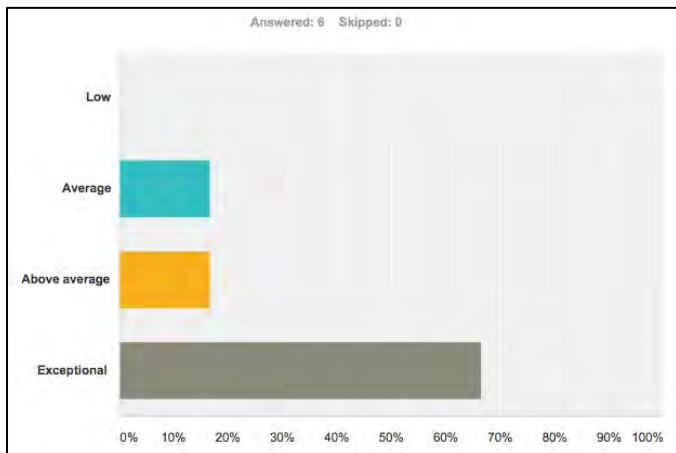


Figure 12: Student Responses to "How would you rate the overall quality of the virtual studio course?"

It would not be unreasonable to conclude that the student experience of the virtual studio was not hampered by its technology and that it was as good as, and in some cases exceeded, the experience of a face to face studio.

6. BUILDING A COMMUNITY OF PRACTICE

One of the essential elements of a face to face studio is the sense of community that develops between students through the shared, sometimes intense, experience of a design studio. It would seem that creating a similar sense in an online world would be difficult or impossible, yet this is not what occurred.

Quantitatively, 4 of the students felt that had had moderate or substantial interaction with the coordinator and one felt they had had little interaction; and 3 of the students felt they had had moderate or substantial interaction with the other students and two felt they had had little interaction.

One student addressed the sense of community in detail:

The virtual design studio has been something I find myself looking forward to these past few weeks. I have enjoyed interacting with all the leadership/coordinators in the class and find that I am learning a great deal. I particularly enjoy when other students/coordinators offer links and resources, which opens my mind to new ideas and places to look for inspiration. I also find that the virtual delivery is not affecting me in a negative way. I have experienced design studio style classes through my arch tech diploma, as well as just art classes in general. I always found seeing other's work was interesting and helpful, and the instructors input is always helpful, but I don't feel it is lost in the virtual format.

This sharing of links and resources through social media, particularly between students, was one of the most important aspects of the virtual studio. Not only was this sharing facilitated by the means of delivery but it often happened spontaneously. Moreover, it was not restricted to the Monday night sessions. As one student noted, "I like that it is set up (first with Facebook, then with Trello) so that through the week I can interact with my classmates and instructors."

Moreover, the inclusion of students from different studio levels created valuable cross communications in which higher level students shared their experiences with those in lower levels.

Based on the interactions, the feedback and the work of the students, a sense of community was indeed created during the weeks of the virtual studio.

7. WEAKNESSES OF THE VIRTUAL STUDIO

A virtual studio is not without its drawbacks. One student commented in the Midterm Survey that,

The biggest [challenge] I can see is the ability to communicate interactively with visual spontaneity (sketching) to explain your ideas, and the coordinator, crits to explain theirs visually. Being as architectural thinking is based on visual/graphical thinking this is crucial. Not only is the students ability to develop ideas hindered, but also the guidance and direction received is handicapped by verbal delivery.

Similarly, in the Final Survey, a student suggested that,

I think better visual communication is an absolute necessity. There are high quality digital sketching tablets available, for example: Wacom Cintiq 13 Pen and Touch Tablet (DTH1300K) which I think should be a prerequisite for a digital studio. I'm planning on buying one and mastering how to use it for my design development sketching rather than trace paper or sketch pads which get lost and have to be scanned and uploaded before shared and never look that good in digital media. I think it's the logical way for a digital studio to tackle the future of sketching in design development process and fully integrating this technology might help push the studio into the unique place where it is truly special in more than just it's convenient mode of delivery.

It is hoped that as pressure sensitive tablet with sketching capabilities become more affordable that this problem can be addressed.

Time is another weakness. The student who was concerned about visual communications also noted:

The other challenge is the time. I don't think 15 minutes a week is enough time to discuss studio work. I am constantly seeing students being cut off and idea not being fully

explored or resolved because of short time constraints. In the same way I don't think 10 minutes is enough time to deliver a project proposal to crits in a way which fully explores your design process, iterations, and final design solutions.

This is also a serious concern. In a weekly meeting where each student makes a presentation there will never be enough time to discuss each project in detail. To make a virtue of necessity, however, it was felt that it was important to have students work within time constraints and express themselves succinctly in order to improve their communications and presentation skills. In addition, students could, and did, contact instructors via email or telephone during the week in order to receive individual guidance.

The short (10 minute) presentations at the Midterm and Final Reviews were dictated by the number of virtual and face to face students (11) who all needed to present in the course of one evening. It is hoped that in the future the presentation could be broken into a number of groups and conducted over a number of evening in order to make longer presentations possible.

This does point to an inherent constraint for any design studio – they are very time intensive. The virtual studio worked well with 6 students but if there were 16 it would have been more difficult for each student to present each week. On the other hand, small studios could be conducted on different evenings during the week and the presentations could also be spread over more than one evening.

8. THE OPPORTUNITIES OF THE ONLINE STUDIO

Just as there are challenges to creating virtual, online studios there are also positive advantages. These include:

- Online studios are flexible in that they permit learning anywhere and anytime
- Because of this flexibility, online studios allow students to continue working and allow practicing designers to upgrade their skills
- Online studios can serve students all around the world
- Given the wealth of multimedia resources that online studios can access and support they can be more engaging
- Properly designed to current best practices, online studios can be more accessible to students with disabilities

The virtual studios also suggest ways that traditional face to face studios could be improved. This could include simple things such as arranging evening studios so that working professionals can participate would also make them more accessible.

On a more fundamental level, new technologies from social media to apps can, and should be, incorporated into all studios to allow greater student interaction and community building. It was noted that during the Final Reviews both virtual and face to face students used a variety of presentation techniques from animations to PowerPoint to YouTube videos and while drawings were pinned up in the traditional manner they were rarely referred to.

One senior level, face to face student even rendered his design online in Autodesk 360 and then displayed it in 3D on his cellphone using Google Cardboard – a simple virtual reality viewing system.

These new tools dramatically alter the nature of design, production and presentation and it may be necessary to rethink the nature of every kind of studios to reflect, and take advantage

of, these changes. How does studio pedagogy change, for example, when students can quickly explore a multitude of alternative designs using computer-based tools and then allow critics and fellow students to “walk through” and interact with those designs? There is no doubt that the primacy of paper drawings as the principal form of communications in any studio is being challenged by these digital tools.

9. CONCLUSIONS

One student provided a good summary of the virtual studio: “This pilot project was a complete success, and I think it is going to change the way Athabasca and other Universities look at how they deliver their studios from this point on.”

The pilot demonstrated that it is practical, feasible and relatively inexpensive to deliver a design studio online. Not only was the studio experience not compromised by the means of delivery, in some cases it was enhanced by it.

Face to face studios will continue to be critical to the education of an architect and virtual studios will never replace them. Instead online studios should complement face to face ones. By combining face to face studios with online, virtual studios it is possible to give students a more complete experience of studio learning and practice. Initial studios, for example, may be face to face to help build a sense of community but subsequent ones may be completely online.

Based on the pilot project, the RAIC Centre for Architecture at Athabasca University is now developing a full suite of online studios which will benefit from the lessons learned. These include:

- The need for a dedicated team to support the studio and provide rigorous testing of the technologies involved
- A dedicated telephone line to ensure high quality audio
- The use of simple, inexpensive tools for students to share materials
- The need for better tools for visual and graphic interactions
- Re-examining the curriculum to exploit the opportunities of virtual studios

The best tribute to the success of the pilot, however, came two weeks after the Final Reviews when one student posted to the Virtual Studio Facebook page “I miss our online studios!!! :(“

10. ACKNOWLEDGEMENTS

This pilot project was a cooperative venture that relied on the contributions of a wide range of groups and individuals. Some of the key members of the team were:

David Craddock, National Syllabus Director for the RAIC, who suggested and supported the idea and participated in the reviews.

Grant Moore and Avery Temofychuk, the Coordinators of the RAIC Studio in Edmonton, who graciously accommodated the virtual studio within their face to face studio.

Sam Oboe, President of the RAIC, Ian Chodikoff, the Executive Director of the RAIC, Barry Johns, Architect and Vivian Manasc, Architect for their support and participation in the reviews.

The Edmonton Construction Association who hosted both the virtual and face to face studios.

Dean Lisa Carter, Faculty of Science and Technology, Athabasca University, for her support and encouragement.

Emma Lowry, Student Advisor for the RAIC Centre for Architecture at Athabasca University, for her assistance throughout the project.

The project would not have been a success without the contributions of all of these individuals and organizations.

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