

INTEGRATING ELECTRONIC MEDIA INTO THE ARCHITECTURE STUDIO.

A Teaching Development Grant at the Chinese University of Hong Kong.

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Abstract. Increasingly, architecture students and instructors are exposed to a widening array of softwares, hardwares, and strategies for the production and representation of architectural work. In an effort to promote the effective use of these tools within design education, instructors need to develop strategies for implementing them into the design studios. A teaching development grant which has been received by the Department of Architecture at CUHK is entitled *Integrated Media Design Studio*. This investigation involves multiple instructors, and levels of design studios. It provides an environment of a wide range of available equipment for producing, evaluating, documenting, and communicating architectural work in the studio. In addition to increasing the effective use of technology resources, and also raising the quality of studio instruction, this teaching development grant aims to create opportunities to further integrate other courses within the studio environment.

1. Introduction

The *Integrated Media Design Studio* is a teaching development grant which has been received by the Department of Architecture at CUHK. It aims to provide an environment of a wide range of equipment for producing, evaluating, documenting, and communicating architectural work in the studio. It is intended to involve multiple instructors, and all levels of design studios.

Thus, the project is not about graduate students using special techniques for special projects, rather it is about introducing alternative techniques for ordinary purposes. In an effort to promote the effective use of these tools within design education, the instructors need to develop strategies for implementing the available technology, while also aiming to improve the educational process.

In addition to increasing the effective use of technology resources, and also raising the quality of studio instruction, this teaching development grant aims to create opportunities to further integrate other courses within the studio environment. This would certainly include media related courses



such as Computer Aided Design or Graphic and Visual Design.

2. Premise

The premise for this project is essentially an attitude about multimedia. One attitude might suggest that all architectural operations could be compressed into the environment of the computer, and that a virtual studio could be created in which the design process might work through different techniques, yet never leave the realm of the computer itself. However, the attitude for this project is that computers can be part of a larger palette; one member of a group of tools which are accessible to architects. In this way, the project could be understood as trying to modify or upgrade all of the existing traditional studios, rather than trying to completely computerize a single studio.

3. Project Set-up

Given an attitude that electronic media can be one of several tools to be used in a design studio, the project needed to begin with a strategy for allocating the resources. It seemed important from the beginning to provide arrangements which were flexible to a certain degree, and capable of serving a diverse set of needs which might not be clearly defined in advance.

3.1. MODELS WITHIN THE DEPARTMENT.

Although the Department of Architecture at CUHK is relatively young, there were still a few relative examples for linking departmental resources with the studios.

The first obvious example was the material workshop. Similar to most schools, the material workshop has a variety of tools and equipment available in a segregated work space. However, the department has also constructed two mobile workstations which are usually parked in spaces directly adjacent to the design studios. These workstations typically contain a drill press, a stationary jigsaw, a disc sander, and a vice, all mounted on a heavy wooden work surface. Naturally, the workstation also serves as a place for using a variety of handtools which can be checked out from the workshop.

Secondly, there is a photography lab in the department, which is closely overseen by a specific staff member. Due to the sensitive nature of most of the equipment, it is used in a fairly conservative manner. However, photography lamps are provided within each studio on a permanent basis. This encourages the students to use their own equipment, or to borrow from the lab as needed. Furthermore, the students have taken it upon themselves to have photocopy machines placed in every design studio. They manage these outside contracts independently of the department.

And lastly, there are the computer facilities. These consist of a large computer lab, which is also used as a teaching classroom for computer related courses, and a smaller adjacent lab space. Similar to the other

models, some of these resources have also been installed in the studios. Three low-end PC's have been placed in each studio, and networked to departmental servers.

Thus, the models could be summarized as being *mobile stations*, *partial equipment installations* which require student supplied equipment or borrowed equipment, and *complete installations*.

3.2. PROPOSED SET-UP.

Based on the observations within the department, and on the stated goals of the project, a proposed set-up was put forth as follows. Once again, the agenda was to allocate the resources across all of the studios, and to provide additional arrangements which would be flexible in nature. While the type of equipment is rather consistent in all three instances, the type of use is notably different.

3.2.1. *Studio Installations*

The existing computers in the studios are being upgraded with software and external hardware for video capture. At least one miniature color video camera is also being connected in each studio, accompanied by lighting and appropriate work surfaces.

The studio installations essentially provide for convenient use by individual students within the studio environment. It allows for students to quickly and selectively grab digital still images of their models, using the video capability for instant feedback on the monitor. Additionally, the miniature size of the camera allows for views of small models which would otherwise not be possible.

This simple modification suddenly integrates the existing computers into the design studio. Although they had been placed there previously, they had not been applied to studio projects.

3.2.2. *Mobile Stations*

The two mobile stations are flexible, but essentially consist of a computer, monitor, miniature video camera, and M/O drive. Additionally, they can include a combination TV/VCR, a small projector, or even a laptop PC.

These units are for faculty use in teaching. They are ideal for use in conjunction with video projectors, which have been installed in many of the university lecture halls and classrooms, and they are also ideal for project reviews, informal discussions, or for providing additional support in a studio. The key factor is that they are mobile, and capable of handling impromptu scenarios.

3.2.3. *Media / Computer Classroom*

Lastly, a computer classroom is being fitted with a video projector, miniature video camera, printers, scanners, etc. There is also an existing video editing station which is intended to be more fully integrated with the new equipment.

This room is different than the studio installation or the mobile station. Since it accommodates an instructor or leader, and it also provides a workstation for each participant in the group, it simultaneously allows for the presentation of material to a group of students, and for the individual work which can be done by the participants.

3.3. INTEGRATION OF VARIOUS RESOURCES..

The purpose for the flexibility of the set-up is to encourage instructors to expand the dimensions of use. While the project certainly aims to bring appropriate computer applications into the studio, it also has an interest in bringing together other resources, such as the workshop, photography lab, and the library.

4. Project Implementation

Implementation certainly implies more than purchasing and installation. As stated previously, the existing computers in the studios were not really being used for design studio purposes. Thus, there needs to be an active plan for implementation, and it apparently needs to be applied at two levels. First, a culture needs to be introduced into the faculty whereby members continually exchange knowledge, procedures, and know-how, regarding the variety of operations which could be brought into the studio. Secondly, studio instructors need to be encouraged to integrate these operations into the studio assignments.

4.1. FIRST YEAR STUDIO IMPLEMENTATION.

In an effort to promote the effective use of these tools within the overall design education, it should be assured that they could be introduced as early as possible. Thus, the initial implementation of this project was intended to be carried out in the First-Year Studio.

4.1.1. *Group Discussions*

In an effort to introduce the video equipment into the studio culture, the instructors first began by using it in the weekly group meetings, in which the entire year of students meet with all four faculty members in order to discuss the design problem. In this case, the camera was used at the front of the classroom in conjunction with a video projector. It provided large views of the selected models, which could be discussed on screen by the entire group of instructors.

Furthermore, live images of the model were projected onto a chalkboard, and then traced. When the video image was removed, then the line drawing could be discussed for issues of perspective and composition, or it could be discussed in terms of the actual design of the building (volume, enclosure, structure, etc.)



Figure 1. Sketching on video projection.



Figure 2. Camera with model and drawings.

4.1.2. Design Work

After exposing the students to the equipment in a lecture setting, the camera set-up was installed in the studio, and plans were made for using it within the design process.

Essentially, a traditional design problem and its requirements was issued, accompanied by a prescribed series of formal tasks and manipulations. Various diagrammatic models are required, which are based on diagrammatic plans and sections. Each of these models needs to then be translated into a series of views which are once again 2-dimensional drawings. This series of operations emphasizes the connections between medias. It also provides possibilities for evaluating work, and allows for potential iterative processes within the sequence.

Fundamentally, the use of the electronic media attempted to enhance the design process, and increase the clarity of architectural abstractions, while also opening the studio experience to the inclusion of other technologies.

4.1.3. Representation

Naturally, in addition to the design process, the electronic media is useful for representation as well. Students have found the miniature video camera to be very helpful in producing images from final models, and quickly producing interior and exterior perspectives for their presentation.

They have also been using it simply to keep photographic records of the development of their projects over time. These electronic files are printed out as a series of images in a logbook at the end of each project.

4.2. CONSEQUENT USES IN OTHER STUDIOS.

The experience of this project has shown that if a few individuals integrate a flexible tool into their curriculum, that other individuals will find applications for the tool as well, if it is made readily available to them.

During this period of trial implementations in the First Year Studio, other instructors have continually been kept informed of the activities being undertaken, and the resources which were being applied. Much of this communication has been informal, but it has also been conducted within

formal meetings such as resource/facility committees, research seminars, and project reviews.

In one instance, a teaching assistant for the Master's program borrowed the mobile set-up with a VCR for recording a review. Although he had not been requested to record the event, and had not formally been introduced to the set-up, he had seen it being used in a classroom earlier, and thought that it might be a good idea. He found that the camera was non-obtrusive in the review, due to its small size, and that he could film discussions as easily as he could film close-ups of the models and drawings which were being discussed.

The mobile set-up has also been borrowed by the 2nd-Year Studio for group discussions about a large site model. The site model of a village in China is so large that it had to be constructed in a separate room, and thus it is removed from the studio and other facilities. Although the students can all gather around the model for discussions, the use of the miniature camera makes it possible for them to all see the same "worm's eye" views simultaneously.

The 3rd-Year Studio has used the equipment and research staff to show students how to generate final renderings by combining photos of the site, with appropriate views of their models.

Lastly, a thesis student has used the research staff to introduce a calculation software which is applicable for his design project. This software is available on a CD-ROM, and can be used in the studio. Such use will hopefully encourage other students to bring library resources into the studios as well.

4.3. FUTURE IMPLEMENTATIONS.

Clearly, there are many opportunities for further expansion. In addition to introducing new equipment to the studio, this teaching development grant aims to create opportunities to further integrate other courses within the studio environment. This certainly includes computer related courses such as Computer Aided Design, or courses in building and environmental control systems which might employ calculation softwares.

Such opportunities are currently being pursued through the faculty members which teach those courses, as well as through the researchers which are working on relevant projects.

While the computer applications are an obvious link, there is also a potential link with courses such as *Graphic and Visual Design*. It is quite possible that the visualization or representation techniques employed in the studios may now feed back into the courses which deal with these issues.

5. Conclusion

While this project has not been completed, it has clearly begun to have a significant impact on the department. This is partly due to the electronic media itself, and the opportunities that it presents for revising teaching and

working methods in the design studio. But this project is also having an impact due to the cross communication and interest that has been generated among the faculty members.

The implementation depends on the effective transfer of technology to the studio instructors who are responsible for planning the studio projects and curriculum. Researchers, or instructors with areas of special interest, are finding a forum within this project for continually introducing their softwares, technical instruments, and know-how to other instructors.

It has also been observed that the initial success in creating such a forum is based on the flexibility of the set-up, not necessarily the size of the budget. While this project actually has a reasonable budget, the initial ground work described here was all completed with existing equipment combined with new equipment which used less than 4% of the total budget.

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