The Use of Digital Media in the Study of History and Theory

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Introduction

My research and activities focus on productive ways to integrate digital media into undergraduate architectural education. This paper discusses ways in which I have used digital media for classes focusing on history and theory of architecture. Along with a brief description of student assignments, I discuss the process of using the media, and its associated strengths and weaknesses. I conclude with observations for others who might pursue a similar path.

As a basis for research, I created a History/Analysis class which made exclusive use of digital media. The subject of study was Old South Church, an important Boston building noteworthy for its exemplary architecture and its rich history and tradition. The church managers agreed to give students in the class full building access, as well as access to historical records, drawings, and so forth. Additionally, people associated with the church agreed to be interviewed and to provide special insights into aspects and areas of the church normally unavailable to the public. I was also able to secure assistance from the architect charged with church upkeep, renovations, and so forth. Once again, the architect provided complete access to all current and historic documents.

Students in the class were broken into a number of small groups and assigned finite research tasks. In addition to traditional methods of research, students were encouraged to develop ways of using digital media as a means of exploration. For example, the movement of the sun is often important in architecture. The traditional method for studying and presenting solar movement is to prepare drawings which show the sun's path/effects. Using digital media it would be possible to use time lapse photography to show the sun's movement.

All final work was presented by means of digital media. This allowed the class as a whole to consider a wide range of different media, while encouraging individual students to develop relative expertise on a limited range of media. For example, a small group of students was assigned to interview the head sexton of the church. To prepare for the interview students researched issues related to the sexton's work and developed a set of questions which would be appropriate to the overall research project. At the same time students learned how to use digital video cameras and recorders along with lighting kits, microphones, and so forth. Interviewing skills were also critical. After conducting the interview, the same students were required to analyze the data, make appropriate selections which enhanced their overall research and presentation, and to edit the video and bring it into the larger project.

The final product of the class is a MacOS-based CD ROM which, using Macromedia Director as an authoring tool, presents student research by means of non-linear video, QTVR, sound, still images, drawings and text. In the final product, some research elements had to be eliminated due to storage limitations.[1]

For example, given its large file size, some interview material was eliminated from the final product.

Students were asked to submit a weekly journal of their activities and observations, particularly as related to issues of digital media. These journals serve as the basis for assessment of learning. They also helped me to adjust my teaching methods as the course unfolded.

Thus, in this class students were challenged to explore ways in which the use of digital media would help them to do thorough and thoughtful inquiry into a topic, and to present a complete report on their findings

While my full report to the National Science Foundation contains many more points which are discussed in much more detail than can be presented here, what follows are a few highlights from the process.

Students Enthusiasm Led to Ongoing Commitment

Even before the class was officially added to the semester's elective offerings, it was oversubscribed. A preliminary meeting was held one month prior to registration to discuss goals for the class, the proposed working method, the topic of study, and so forth. At that time students were given the basic course calendar, specific topics, and issues for research. Student journals from the first two weeks reveal their attitudes. Consider the following excerpts:

> I look forward to learning a tremendous amount this semester and to use it for the rest of my life. I'll be ready to rock on Monday and start production!

> Though I've only made a practice QTVR of our work space, I can't wait for this technology to reinforce what I'm learning or to amaze me even more. The electronic capabilities we have here blow me away.

Clearly students were excited about the project and were ready to work. Their eagerness showed through a commitment to the project which was generally unwavering throughout the term. A comment which I frequently heard was that our inquiry was exponentially more interesting than doing a traditional research paper. In similar classes which I have taught, but which have

used traditional methods of research and presentation, there is typically a lull in student activity at some point during the semester. Students in this class had no such lull. In fact, they were so self-motivated that two instructors who had several of the students in their design studios the same term asked me if I would speak to the students about spending less time on this class, and more time on the studio project.

Success with Teamwork

It is important for students to experience teamwork, and Wentworth works to incorporate team projects into its curricula. In my experience teamwork often has mixed success. Using digital media, however, made teamwork almost unavoidable, in part because the complexity of the equipment being using forced the issue of teams – students simply could not produce the work alone. Consider the following comments;

> The team aspect of this class has progressed far better than I would have anticipated, in large part due to the separation of the whole project into small parts with small teams on each. My feeling is that in order to be able to complete my tasks I will have to sit in with other groups to become familiar with the processes they are going through.

> Friday afternoon the interview groups focused on getting prepared for the first interview, scheduled for 3:00 p.m. We anticipated getting there by 3:15 to set up, which we did. The interview went quite smoothly for the first one, everyone worked together and listened to each other. I was the interviewer and the coordinator or director, in a way, but we all worked together to bring it up to par and select the positioning of lights, camera, and the interviewee. It was a definite group effort.

It was amazing to see students working together as closely as they did throughout the project. There were typically volunteers who were eager to assist other teams as they carried equipment to the site, analyzed and edited data, worked to learn software, and so forth. Intra-team communication was also very good. Various teams were quick to let other teams know the types of data they needed, and in most cases helped one another collect the data. For example, for the first series of on-site interviews, the leader of the assigned team notified all other teams of the scheduled date, and asked for questions to be submitted which could be included in the interview. Thus, when the interviews were conducted, the team doing the interview was able to ask questions not only for its own use, but also for others.

Simulations Have Increased Realism

Without exception students believed that, when compared to traditional media, digital media provides a more realistic simulation[2] of the actual environment. Representative quotes include;

> A book can describe the bell ringing, and an image can show you a view of Copley Square, but the observer is kept at a distance by the limitations of that particular media. Digital technology on the other hand, has the ability to let people hear the bell, look around the square, see the sun moving around the building, and have control over the way the information is considered. It is more interactive and representational of what actually happens in, and around the church.

> By providing several types of media, one is brought a little closer to the real thing – giving several feelings for the space instead of just one. Granted, what we are producing will not give someone the actual feelings of being there, but it certainly is a step closer than traditional media.

Similarly, students felt that digital media allowed the possibility of more nearly replicating the way a person might move through, and discover things about, the church. For example, two students were independently assigned the task of studying the iconology and iconography[3] of the church, and then presenting the results of their research. Rather than present a still photograph of each icon along with a brief text analysis, they sought a more realistic simulation. Consider the following comment;

> I am excited to be working on this phase (icons) of the project because I feel that using digital media will bring this to the next level. Looking at pictures and reading text provides the necessary information for one to remember the general idea, but what I want to do will give you the feeling of being there. I want to have the image on the screen and the user of the program will be moving through the building like he/she is really there. When he/she comes to an important icon, it will "glow" so that the person knows it is important. It will then be possible to click on the icon for a larger, more detailed image of it. This will help the person to understand it more than a book. Also, I can have a voice over instead of written text. This will grab the viewer's attention and possibly create more interest in the subject. (May I suggest Sean Connery as the voice of the "icons".)

The "real" experience of a person walking through or by the church and discovering an icon was critical to the success of the simulation. With traditional media there might have been an overall picture of a wall and a variety of annotated, larger scale images focusing on the areas containing the icons. This style of presentation, however, does not tell a reader what it is like to discover the icons. The two students assigned to this task sought a type of simulation whereby a user might "walk" by a wall, glance up, and see an icon. At this point the user's interest could or could not be stirred to explore further. Digital media, using current virtual reality image software, allows a user to "walk" in an area and look around by moving the mouse. If the user sees something of interest, in this case an icon, he or she can

zoom in on it by holding the mouse button and the control key. From this point an attached analysis is quite easy.

It is important to note that while these students were thinking of how to convey the information, they were themselves confronted with studying and understanding the information they wanted to present. Thus, the use of digital media led them to do an intensive study which focused on the individual parts, and on the greater gestalt which contained the parts, arriving at a detailed, yet holistic understanding of the building.

A More Robust Presentation Leads to More Robust Understandings

Students argued that the best way to study the building was by means of a wide variety of presentation styles. This belief arose, in part, from concern about the nature of the "gaps"[4] that were inherent to different types of simulations. Consider the following quote;

> I believe that digital simulation can certainly help viewers get a rich understanding of architecture or a particular architectural space, as long as it incorporates many different angles and views allowing the viewer to go through the information and give weight to what influences them. This will offer the viewers their own unique experience and one that allows for personal input. When viewers must use their own minds, there is interest, and this is important if we want to keep the information from getting stale and allow the viewer the opportunity to gain a rich, almost intangible understanding.

As an example of the robustness and freedom being described by the students above, consider the variety and type of options which were available to users of the final CD ROM who wanted to study the church's stained glass. These users could elect to study the glass in at least six different ways. They could look at the overall interior or exterior images which include the stained glass along with other features of the church, and thereby see the glass in its context. They could look at the virtual reality shots of the interior and exterior which allow them to not only move about the church interior, but to zoom in and out on the parts of the stained glass which interest them. They could review various video files, some of which focus on stained glass in particular and show the glass under a variety of different, changing lighting conditions. They could go to drawings of building plans and elevations to see how the stained glass fits into the wall and overall design of the building. They could go to a section of the project devoted exclusively to stained glass where images of the glass are described and analyzed. Finally, was the ability to watch a time lapse video of the interior and the changing light throughout the day. This variety, made possible by digital media, provided a thorough analysis of the glass, but in a non-linear fashion. Moreover, again using this example, students learned a tremendous amount about the stained glass, not just as an object, but as a broader piece of the church's overall gestalt.

Phenomena of Church More Easily Presented

Working with digital media, students noticed things which they might have otherwise overlooked. For example, one element of study was to consider ways in which the organ phenomenally[5] impacted the church architecture. The organist agreed to be interviewed and then taped while he played a Bach piece. Additionally, students were allowed to take cameras into all of the areas housing mechanics for the organ and to take pictures of the mechanisms in action, thereby obtaining first-hand experience of the process. All students came away with an increased appreciation for the organ and its place in the architecture. Referring to the interview one student said;

> While watching the interview today with the organist, I began to see how much knowledge and enthusiasm he had for the organ. If he wrote all that information and presented it in text form, I probably wouldn't have been as interested. Because I was able to see his enthusiasm for music and the organ, I became much more interested in the subject.

Similarly, referring to the performance another student said;

> Ahhhwww today was a wonderful day for the organ. Many (students) experienced the organ from the sanctuary, while I was able to experience it from the behind the scenes. I was able to look at the pipes tiny and huge, and the enormous sound they all created from about 2 feet away. The experience was unbelievable. The organ is really very nice, and I hope to use the audio from the tape to put into the video.

As discussed below, while students felt that digital media had limitations in its ability to reveal the full range of phenomena in the church, they felt it came closer to conveying the nature of being in the church than did traditional media.

The Life of the Architecture is Shown

Many in the class shared the concern that by failing to include people in their simulations of the church, they might also fail to convey much of the church's character and life. Digital media, they felt, provided the opportunity to convey the spirit and enthusiasm integral to an architecture created by, built for, and inhabited by, people. The students doing the interviews came to see how an interview could contribute to the overall project not only in terms of the explicit subject matter, but also in terms of more subtle things like composition, tone, and so forth. One student said;

> It is interesting to think of how to film each personality and how to get a wide range of spaces within the church, so one feels that even with the interviews they are moving about and learning about the church through simulation. I felt it impor-

tant to show the ministers in different situations and settings but always within the church. An interesting development is that many of the interviews were actually conducted in the ministers' favorite spaces.

Similarly, in reviewing an interview with the senior minister of the church, one student said;

> I think now I realize the importance of having this project on a CD ROM instead of written text. It allows the viewer to hear and see the compassion that these people have for this place. Listening to their voice, instead of reading the words, gives a totally different character to the place. This is a project about exploring a specific place and its meaning (its essence). Having this visual aid that supplies senses like sound and movement, really lets a person feel what its like to be in that space.

In order to convey the ministers' excitement and enthusiasm, students decided that they wanted to present the interviews in a conversational style. A person using the completed CD ROM would have the feeling that he or she was speaking with the minister. As such, the students decided to omit themselves from the digital video, and instead have the ministers speak directly to the user of the CD ROM. Removing the intermediary, they felt, created a better learning environment, and a more realistic simulation of what it was like to speak with the minister. One student said;

> The interviews helped me to start understanding how I might begin to relate the "feelings," of the church through the actual people, who know the space best. I am getting a feel for what I need to cover in order to really express the feelings this church has. This is a topic we should address, how to convey peoples' experience through the use of digital media. We are trying to create a simulation of experience and an understanding of others (first hand) experiences, all through digital media. The nature of simulation is the participant gaining a, kind of, virtual experience and the nature of understanding is the participant engaging others experiences and relating to them. These interviews, like the videos and other visuals, must, in essence, "talk" to the participants and make them feel integral or make them feel a part of it. We want people to virtually experience and understand.

This notion of "conversation" was very important in the class, and impacted many of the design decisions made by students.[6] This was particularly true with regard to the design of the user interface. A goal for the final product was for a user to be able to "speak" with the CD ROM. The user would speak by making a selection, or choosing to view some element of information. The CD ROM would speak by presenting that information in as "life-like" manner as possible. Ease of exchange was a critical factor for design.

The "conversation" approach to design was not limited to interviews with people in the church. It was also stressed that the building itself should speak to users. Typically this was expressed as the "life" or "spirit" of the building. Consider the following quotes;

> When I have been shooting the exterior, with video, I am trying not only to capture the building in it's surroundings, but also to capture the life of the building. How it sits so prominently on the corner, how it shows itself to people far away with its bell tower – these are just a few things I want to have people understand. This is tough, and there are many factors that also have an effect on this.

> As I was in the process of editing these clips I realized what influence digital media could have in viewing and studying different sites. Until now the way I was approaching this subject was; of course digital is better than written words, you always hear the expression, a picture is worth a thousand words. Making these clips made me realize you can turn those thousand words into a great experience, not just a picture.

While the two students above believed that digital video provided them with the opportunity to meaningfully share their experience of the building with others, they also wondered if providing additional information along with the video might improve the simulation by filling a few more gaps for the user. The notion of filling the gaps, which has already been discussed above, became a major issue for the students, and in this instance brought forward the idea of optional voice overs to provide further information for a user.

Students Come to Look More Closely at the Architecture

Throughout this project students studied the history and theory of a significant piece of architecture. As is already apparent, the media influenced the way in which they worked. In summary, one student said;

> Not only does digital media provide movement in a video, as opposed to a still picture, it allows one to be part of the space's sound and natural elements. It influences the way one reports on built form. It requires each person to look at the subject matter more closely and instead of just documenting it, portray its most important elements in an experiential way.

Again, the final student project reflected a very thorough and thoughtful understanding of the building. Early in the semester I suspected this might become the case when no students approached me to ask "how long" their work should be. Rather, students worked on their assignments until they felt they had adequately covered the material.

Critique

I also asked students to discuss limitations of digital media which they discovered in the course of doing the project. Again without exception, students felt that while digital media could provide the best possible simulation of an actual environment, it remained in the world of simulation: nothing could replace an actual visit. For example, students said;

> To experience the organ at Old South, you must go to Old South. There is no substitute for the effect of the different placement of the pipes all around you... it's something unrecordable. For me there is no way that anything can top the experience of climbing through the pipe tower and not only hearing the pipes played directly next to me, but also feeling the wind blowing through them. That's something digital media will never be able to accomplish.

> Documenting the phenomena is what I find the most difficult task of the interactive production. It is in this area where digital media always seems to come up short. Since phenomena has to do with an individual's perception of things, it is very hard to produce something. There really is no substitute for the real thing. In a CD ROM it is only possible to use two human senses, so in effect, we're operating with a few missing players.

These comments, which are grounded in issues of phenomenology, are unavoidably true. For example, no visual image alone can convey how it felt for the student to climb about the interior of the organ tower as the organ played. The sound, the wind, the vibration of the structure – all of these physical phenomena contribute to the quality of the architecture in that moment. However, had it occurred to us at the time, students could have conducted an on camera interview with the student as soon as he came out of the organ tower, and captured his sense of wonder and excitement. Combined with his video of organ bellows opening and closing, valves in movement, the different quality of sound in different parts of the tower, and so forth, the phenomena which he experienced might have been nicely conveyed. Still, the question of how to make up for "missing senses" became of increasing importance to the class, and could serve as specific topic of study in the coming academic year.

Summary of Findings

In the process of developing and teaching this course, I found there to be a high level of interest in the topic among students. Students enrolled in the class began the term with both a sense of excitement and a fear of the unknown. While the students had a general knowledge of computer aided drafting programs, most had little or no additional computer knowledge. During the first two weeks their fears diminished as they used the digital equipment and software. Most students became even more excited as they entered the first part of the learning curve. By the end of the term virtually every student reported a positive learning experience and was quite proud of the work produced.

Without exception, all the students came to believe that the digital media project they were producing provided a more realistic representation of the church than traditional print media could achieve. Students felt that the CD ROM gave a robust presentation of the building. It offered users many ways to study the same topic, its non-linear quality allowed users to move through it in a way they chose, and it had a great deal of variety in its content.

Students also felt that the spirit of the building and its people were conveyed much more realistically and robustly with digital media than with traditional media. Students felt that the live interviews, transferred to digital format and included on the CD ROM would help users to become excited about the topic themselves. Toward this end, the project was designed to work "conversationally," allowing CD ROM and user to engage in metaphoric conversations. Regardless of the task assigned, students worked to capture the "life" of the building. This effort ranged from efforts to digitize the historic drawings in such a way that their hand-drawn qualities would not be lost, to the way in which video would be shot, properly revealing the way the building sat on its site relative to the other surrounding buildings.

Students also found that the use of digital media had a positive impact on the way in which they worked. Among the ways their approach to research changed, students reported that they found themselves studying the subject matter more closely than they had in the past. I suspect this change is in part a result of the ease with which data could be collected. Because they spent less time gathering, they could spend more time studying. Also, I suspect the relative ease with which the data could be collected and presented encouraged students to determine when they had adequately covered the material (as opposed to meeting some arbitrary completion point such as "X" number of pages).

Finally, while it is too early to draw any sweeping conclusions, it is likely that the class helped some students to acquire skills which they would not otherwise have had, and which helped them to secure work in the architectural field, or places in graduate school. Also of note is the way in which students in the class served to pollinate the school in general, as they taught other students elements of what they were learning.

NOTES

1 A single CD ROM holds only 650 mg of data. Our final product approached 850 mg.

2 Architecture is unavoidably concerned with various types of simulations. For a complete discussion of simulation in architecture see; Sims, William Riley. *Iconic Simulations: An Evaluation of Their Effectiveness As Techniques for Simulating Environmental Experience Along Cognitive, Affective, and Behavioral Dimensions,* MIT Ph.D. Thesis, 1974.

3 Iconology and iconography are discussed in: Erwin Panofsky, *Meaning in the Visual Arts,* (Chicago: University of Chicago Press, 1955).

4 We discussed the ways in which each type of simulation of an actual site serves as a lens which allows a viewer to focus on certain aspects of the site, while simultaneously leaving large gaps in the full range of information available in the actual environment. Gombrich notes that the gaps in any simulation will be filled by a viewer in a way that is in accordance with his or her ways of engaging the world. Thus, the relative fidelity of each type of simulation will relate to the number and types of gaps which it leaves for the viewer to fill. For more see; E. H. Gombrich, *Art and Illusion,* (Princeton: Princeton University Press, 1960). Also see: Geoffrey Vickers, *The Art of Judgment,* (New York: Basic Books, 1965).

5 While I did not want the class to become a digital exploration of notions tied to phenomenology, I was very interested in the ways in which the experiential qualities of the church might be conveyed using the new tools. Students pursuing this path were particularly impacted by: Heidegger, Martin. *Poetry, Language, Thought,* (New York: Perennial Library, 1971). Bachelard, Gaston. *Poetics of Space,* (Boston: Beacon Press, 1964).

6 For a more complete discussion of the conversational process of designing see; Schön, Don, and Glenn Wiggins. "Kinds of Seeing and Their Functions in Designing," *Design Studies,* Vol. 13, No. 2, April, 1992.