ABSTRACT

In the initial two years of offering a new undergraduate degree program in Electronic Media, Arts and Communication (EMAC), Rensselaer Polytechnic Institute’s iEAR Studios has faced the problem of delivering studio-based courses in computer music and other electronic media to a fast growing population of undergraduate majors. In order to accommodate the greater number of students taking hands-on production courses we have had to adapt and revise many of our basic assumptions about our teaching paradigms and about the physical organization of our studios and classrooms.

iEAR & EMAC

1.1 iEAR’s MFA Program & Studio Facilities

Rensselaer Polytechnic Institute’s iEAR Studios has, since 1991, been the nexus of creative studio work for students and faculty in the Arts Department’s MFA program in Electronic Arts. Supporting a population of between 20 and 30 graduate students and associated faculty, staff and visiting artists, iEAR has developed facilities in which music and video have been housed in studios designed for individual use, while graphics and animation facilities have been based on a multi-user computer-lab model.

In September 1996, in collaboration with Rensselaer’s Department of Language, Literature & Communication, the Arts Department began offering an undergraduate major in Electronic Media, Arts and Communication (EMAC). EMAC was initially planned as a means of bringing in five majors a year, for a four-year steady-state of 20 majors. This, we reasoned, would provoke moderate growth in our studio facilities without overtaxing our resources. When we began the first semester of EMAC, however, we found ourselves with 42 students enrolled, and strong pressure from the administration to re-adjust our sights to a goal of enrolling 50 new students annually. In terms of planning, this meant that we were now looking at a steady state enrollment of 200 majors, rather than 20.

1.2 EMAC: Collaboration & New Demands

EMAC’s success in attracting new enrollment presented us with an exiting opportunity to grow. The success of the program had a major impact on the internal and external image of the Rensselaer, which has always been known primarily as a first rate engineering school. No one had ever seriously considered the idea that a program in the Humanities or the Arts could be a major attraction for new students, yet this was clearly now the case.

The dramatic increase in our student body also caused us to reconsider how we teach and how we manage the facilities at iEAR. Besides the simple fact of having to teach more majors, each of whom demand a significant amount of access to technology, we have had to deal with a number of issues which are related specifically to the collaborative nature of the EMAC program, to our continued commitment to emphasize creative work as the core of our curriculum, and to the increased impact of EMAC on Rensselaer as a whole.

As a collaborative degree program, EMAC includes theoretical study of communications theory and practice, as well as creative work in the electronic arts. In their first year, students take introductory courses in computer music, video production, computer graphics and web authoring, followed by advanced studio courses in at least two of these areas. As the focus of the creative work towards the degree, iEAR is responsible for providing facilities support for these classes, in addition to our previous support of graduate students and non-majors. Central to the
basic concept of the EMAC program is the idea that once students have been introduced to the various electronic media, they will continue to use all of these media in many of their future courses. The fundamental idea is that communication and artistic expression have, through the electronic media, broken the bounds of isolated disciplines. We believe that we will all be using a wide variety of media to express ourselves and communicate in the future, and that we need to encourage this in our students. This means that EMAC majors need access to iEAR’s facilities not just for their Arts courses, but also for their Communications courses. In fact, we hope that they will use this expanded sense of media for everything they do, and that it will in turn influence communication and expression across the campus.

While this all seemed very visionary and exciting when we began to put these ideas together, having the opportunity to actually put it into practice on such a large scale has meant that we’ve had to deal with some very concrete and fundamental problems influencing how we teach, how we equip, operate and maintain the studios, and how we relate to the rest of the institution. We have had to find ways of making more use of the Institute’s general computer labs and support services for our studio activities. We have also had to devise ways to control access to studios and to sign-out privileges for production equipment which allow majors to continue using equipment throughout their time here, once they have completed their introductory courses.

However, the most far reaching challenge, which I will detail in the remainder of this paper, has been to find ways in which we could re-think our teaching methods and our use of classrooms and studios to deliver the best possible creative instruction to our large numbers of majors.

INSTRUCTIONAL MODELS

2.1 Classrooms vrs. Studios

Before the advent of the EMAC majors, we had three basic models for teaching. First, there were lectures or seminars, in which there was little use of technology beyond audio or video presentation by the teacher. Second was the model based on traditional computer music or video studios, in which a small class meets in the studio and the class time includes both demonstration of studio components and listening/viewing and discussion of historical and student generated work. The third model was based on traditional computer graphics instruction, in which each student sits at a computer, and the class involves students actually stepping through software projects with the instructor.

The growth in our student body brought with it some serious pressures which caused us to reconsider these models. First, we needed to simply enroll more students, which makes the lecture/seminar model much more attractive. Secondly, we needed to teach more students a wider variety of hardware platforms and software applications, which makes the computer graphics model more appealing. Thirdly, if we are to really function as the creative center of EMAC, we need to make sure that students have ample opportunity to have individual critique of their work and demonstration of studio practices, which makes the computer music/video model more attractive.

There are significant problems with each of these models as well. The lecture/seminar model, obviously, doesn’t allow students any chance to interact with the studio, although this can often be the best forum for discussion. The computer music/video model seems to work well in small classes or ten or less. When classes go beyond that number, hands on demonstrations tend to get crowded out. Also, individual studios generally can’t contain more than this number, and often ten people are even too many to fit into a studio designed for one or two users. The computer graphics model seems to have two problems: first, it is very expensive in terms of equipment usage, if everyone has their own computer in each class. Having a studio with 10 work stations seems significant. What if you need to teach 30 or 50 at a time? The second problem with this model is the actual amount of use the facilities get during class. Anyone who has taught in this environment has had the experience of finding students immersed in reading their email or playing a computer game in the midst of a discussion or demonstration. If this is the way students are using the facilities, how can we justify this level of investment in teaching facilities?

Added to these questions about teaching models is the fact that, in general, the same facilities which are used for teaching must also be kept available for students to use on an individual basis for class assignments and larger creative projects, which may or may not be undertaken as part of an individual class. In this case, real estate becomes an important commodity. If you must serve many students, you want to group as many work stations as possible into any given space. However, then you are forced into the computer graphics model of teaching, and
many workstations are taken out of circulation for every class period. Or, if you isolate workstations into individual-sized workspaces, you are forced into the computer music/video model of instruction, and you can not deal with large class sizes.

2.2 Mixing Media

These various pros and cons of instructional models, and the interplay of the different models with the demands of individual student studio usage, is complicated by iEAR’s commitment to the use of multiple media by all students. The centerpiece of the studios designed for our graduate program in 1991 was the Integrated Studio. This facility included a professional on-line video post-production studio integrated with a duplicate of our high end computer music studio, which included midi, ProTools digital audio, and SMPTE synchronization. Similarly, when we designed our original EMAC studio in 1996 we included eight Macintosh workstations for graphics and music, and two SVHS video editing stations.

In both the Integrated Studio and the original EMAC Studio, classes were taught in the studios. In the Integrated Studio the teaching model was the computer music/video model described above. The EMAC Studio, in which all the workstations were positioned around the perimeter of the room, a combination of the seminar/lecture teaching model and the computer graphics teaching model was used with classes as large as twenty-five students, with up to three students sharing a workstation at one time.

2.3 Demands of Larger Student Body

When our first entering class of EMAC majors turned out to be 42 rather than five, we knew we would be under-equipped for the demands of this larger student body. However, not until we started receiving complaints and figuring out how to address them did we realize that just getting more gear was not the answer. As anyone who has run a studio will know, there is never enough gear. It turned out that our biggest problems were ones of access, compatibility, and reliability. It also turned out that, in order to keep the program financially viable, we needed to boost our class sizes from an average of about 15 to an average of between 25 and 30 students for all undergraduate studio classes. Although we initially reacted to this pressure by insisting that studio classes on this scale were unworkable, we have since begun to develop strategies for both studio design and course planning to accommodate these needs.

STUDIO DESIGN

3.1 Studio Design Ideas

The problem of large classes impacts most specifically on introductory undergraduate courses. In graduate courses and in courses for upper level undergraduate majors, the classes necessarily resolve to a size in which the computer music/video model of teaching works fairly well. However, our freshman gateway course and our second level studio courses are turning away significant numbers of students even when we limit the class size to 30 per section. So, it is in the context of these courses that we have had to think most radically about how we teach, and how we design the studios.

The first problem to address was whether or not it is really necessary to teach studio courses in the studio. And the answer, at least for the larger classes, is: sometimes. In examining how we teach, we find that much of the work in the computer music/video model classroom involves the class watching the teacher or a student perform some technical task with the studio equipment, or listening to work being presented for discussion and study. In the computer graphics model of teaching, there is a similar kind of demonstration activity by the instructor, but with periods of individual interaction with the instructor while students work on their projects and the instructor circulates. In this kind of interaction, this model is very similar to the kind of teaching that takes place in a traditional painting or drawing class. Both the computer music/video and computer graphics models resolve at some point to the seminar/lecture model, in which students and the instructor discuss ideas or respond to presentations of work.

With this perspective in mind, we have begun to think about separating discussion and studio activities within a single class. In order to do this effectively, though, we’ve had to make some very specific demands on our classroom space. We are now scheduling studio classes to spend part of their time in seminar-type classrooms, and
part of their time in the studio. We are equipping each seminar room with an array of computer, audio and video equipment and high quality data/video projection, which makes the room usable for most listening, viewing, discussion and demonstration activities. Classes then adjourn to the studio environment, in which students work singly or in small groups at the equipment, while the instructor circulates and offer individual help and criticism.

3.2 EMAC Studio

With this model in mind, we have re-designed the EMAC Studio. It still contains eight computer workstations and three videotape editing systems. However, rather than being arranged around the edges of the room, effectively jammed side-by-side in order to make room for a discussion area in the center of the room, the stations are now divided into several clusters. Although the machines are all equipped to support midi, digital audio, QuickTime video and graphics applications, individual workstations are optimized for either music and video or graphics. The music/video stations are each physically divided into semi-private cubicles to accommodate sound and additional outboard equipment. The graphics workstations, while still placed linearly along one wall, are more spread-out, and provide the user with more privacy and physical desk space. The fact that we are able to book a nearby seminar room, equipped as described above, has allowed us to make the EMAC Studio a better studio environment for non-classroom use, while the room continues to function well in the studio-work portions of the class.

3.3 Computer Music Studio

The Computer Music Studio is primarily a graduate facility, and classes using this studio have always been taught in the studio and in small groups. However, with our revised teaching model, we have been able to schedule a large portion of the class time in the computer-equipped seminar room, making for a much more comfortable listening and discussion environment. This has permitted us to re-design the studio to make it a better environment for individual work, by freeing up space which was used to support the classes, but was always too small and too cramped even with ten students per class.

3.4 Media 100s & Integrated Studio

Our Integrated Studio, designed in 1991, is now quite obsolete as a video and audio post-production studio, although it still works well as a powerful control room for our recording studio. We are now working with both audio and video almost exclusively in digital formats. Our post-production facilities have now moved to computer workstations with Media 100 video post production systems and to the Computer Music Studio, with Digidesign ProTools audio post production capabilities. We now have six Media 100 workstations, and have had the same experience with this studio as we have with the EMAC Studio. We initially tried to put four Media 100s and various other computer and tape-based video systems around the periphery of a large room, in order to leave space for classes to meet in the center of the room. The result was a studio in which there was not enough space to work comfortably at any of the workstations, nor a focused environment for discussion or demonstration. After separating out our studio needs from our instructional needs we have been able to re-design the studio to make more comfortable and private workspace for each of the Media 100s. Class discussion and viewing of work is done in the well equipped seminar room, and the class works in smaller groups in the studio to address machine-specific problems as the instructor circulates between the groups.

CONCLUSIONS

4.1 Looking Ahead to Growth

The unexpected success of our EMAC program has presented us with an opportunity to reevaluate how we think about teaching studio courses in the electronic arts. By separating discussion and demonstration session from hands-on sessions where the instructor interacts with students either individually or in small groups, we have been able to accommodate larger classes, while actually improving the quality of our studio environment.

We are only in our second year of organizing our studio teaching around this model. The fall 1998 semester is the first time we have moved literally all our studio courses to this type of organization. We expect that this change will enable us to continue to accommodate growth in our student population, while keeping consistently high standards for access to equipment and quality interaction with instructors.