Teaching Computer Graphics in Brazil: Social Commitment, Creativity and Passion—Against All Odds!

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A shoestring arts laboratory in Brazil uses a pioneering educational approach and brings social commitment to computer arts. This paper discusses its background and achievements.

The Electronic Arts Unit (Núcleo de Arte Eletrónica, NAE) at Pontifício Universidade Católica do Rio de Janeiro is an arts laboratory where educators, graduates, and undergraduates from science and arts disciplines come together to create and produce art and design projects. At all stages in the projects, a methodology of dynamic, democratic teamwork prompts participants to play new roles: musicians choose colors, animators discuss codes, and programmers create images. Clients range from God to the Devil. We design rock band sites and interactive Bibles! Research projects cover social issues like new media literacy (which is ushering in a new society of netizens, net-fringers, and outsiders), Web design and its cultural implications, and designing ATM interfaces for users with different levels of schooling. Educational results prove we are on the right track: student participants improve in terms of knowledge and skills; develop high levels of creativity, maturity and social commitment; and are now ready to help shape our unequally connected society into something much better for all of us.

NAE: A Locus for Creative Use of Computer-Based Technologies

Until 1992, we were just a bunch of enthusiastic computer graphics educators with different backgrounds (in art, design, computer science, video, and photography) willing to work as a group on innovative multimedia educational projects. We discussed teaching methods, strategies, and course content, but mostly we shared complaints about the enormous workload involved in keeping up with recent hardware and software developments.

In spite of our complaints, we still found time to dream. And we dreamed of having a lab for creative research and development; a place where we could experiment freely on new ideas and techniques — an educational space where we would prepare our students to perceive the real challenges of our digital society and fight to improve it with their spirit of curiosity, their knowledge, and, above all, their social commitment.

The Electronic Arts Unit was set up in mid-1992. All we had was a graphics workstation donated by Sun Microsystems and some old furniture, but that seemed to be more than enough. After all, in those early days, what other educator in Brazil had research and development facilities, an Internet connection, an art domain, plus the valuable help of four student grantees and a group of incredible people to work with?

Our idealistic, pioneering spirit, plus our disparate backgrounds, led us to adopt a methodology of dynamic, democratic teamwork. Although each of us had a basic pre-defined role, according to our core expertise, we encouraged all project participants to play other roles at different stages of the project. At our meetings, musicians would have a say in the choice of colors, animators would end up discussing codes, and programmers had to help create images, whenever possible, necessary, or desirable.

We used to call ourselves The Brancaleone Army (after the 1960s Italian comedy film about a group of medieval bunglers on their way to the Crusades). Individually frail, we were made strong by acting courageously as a group. Like even the smallest pieces of a jigsaw puzzle, each of us was equally important and indispensable in bringing the project to completion. There was a feeling of optimism, and a sense that, regardless of all our differences, we were in this together, and we would open up new and enthralling horizons for our students.

Innovative - Outrageous? - Ideas

Working on this philosophy and methodology, we then started to look around for projects that might lend themselves to innovative experimentation. And we soon found them.

The Brazilian Research and Development Council (CNPq) gave us a grant to investigate the use of computing as a teaching aid for various subjects in arts and design curricula, and as a tool for facilitating relations among the disciplines offered in these areas. Experiments have involved educators and groups of students in subjects like free-hand drawing, ceramics, mechanical systems, and visual language. By setting up a hybrid laboratory, where various techniques, equipment, and materials could be handled in parallel, we provided these educators with a combination of concrete, intuitive techniques and abstract, logical methods at various stages of the process of artistic creation. For instance, computer graphics and ceramics classes were taught (on an experimental basis) at the same hybrid lab. With the help and orientation of our research team, students and teachers were encouraged to exchange, and share, their tools, theories, and techniques to accomplish common tasks. As a result of working on both clay and computers at the same time and in the same place, outrageously original, creative ideas surfaced. In one of the experiments, students molded a shape in clay, then stuck the wet clay shape onto the monitor screen and used it as a template for plotting and modeling the virtual object (see Figure 2). We called this project “Dirty hands on the keyboard!”[1]

Word soon got around about our working philosophy and results, and interesting projects came knocking on our door. When the top Brazilian Rock band Barão Vermelho came into the office wanting an interactive track for their new album (for release three months later!), we did not have a clue how much to charge, much less how to do it, but we accepted the challenge. They gave us complete freedom to create whatever we wanted (and later confessed that they had no idea what you could do with an interactive track either!). All they had was a copy of the Rolling Stones’“Stripped” album, and they just asked us to do a better job, as if our rag-tag army could outdo the Stones’big-time productions!

Over sleepless nights spent worrying about how the whole thing would turn out, the basic concept of the project began to emerge. What do people do when they get home after buying a new album? They kick off their shoes, flop onto the sofa, and go with the pleasurable flow of the senses. So what we had to do to make the project a success was to create auditory, visual, and cognitive sensory pleasure. The navigation flow of the interactive track had to be as intuitive, as pleasant, and as free-form as the audio flow was. No imperative commands (“go to the next page!”), no standard icons and buttons, but suggestions, surprises, tricks, and fun.

Its non-directive interface, its random situations, and the many surprises in store for users on the way helped give the project its intuitive atmosphere, its nonlinear, non-repetitive navigation structure. It is quite impossible to go through it the same way twice! The biggest surprise is when Frejat, the band leader, talks to the user. With his familiar hoarse voice and casual style, he will sometimes give tips and clues, point to hidden tricks or just tease users into clicking on danger spots, all for the purpose of destroying their preconceived notions of standard navigation. We asked Frejat how he would say something like: "Go to the next screen." He laughed, and said: "Only crabs go backwards." We recorded a lot of these unusual, good humored commands and used them throughout the project.

We created a screen for each of the audio tracks, designing them always as a complement to the music. The screen either adds a new dimension to the song or creates a dynamic conflict. For the track "Só as maes são felizes" (Only mothers are happy), we used the image of a dirty toilet bowl, as depressing and lowlife as the lyrics (in spite of the song's title). You have to flush it to watch the video (see Figure 1). Unfortunately, the CD only allowed us about 100Mb for this track. It was like having a short blanket: whenever we tried to cover our noses, our feet would be showing. Three months later, it was ready. The first rock CD with an interactive track developed and produced in Brazil, and it sold more than 150,000 copies in the first couple of weeks! We never expected that sort of success, and, of course, had not charged accordingly. But we do have the gold and platinum record trophies (for more than 400,000 copies sold) hanging on our wall!

This was at the onset of the multimedia "boom," and, in terms of the Internet, we were still just crawling. The magic of the Web was just starting to enchant and entice us. With a little bit of imagination (perhaps a lot), HTML code could be seen as a new graphic toolset for artists and designers. The Web's "chameleon-like" potential for constant change and updating, and its worldwide reach, were definitely new challenges for us. In those early days, we were free to create entirely new things. There were no patterns to follow or models to copy in the pre-dawn of Web design. On the other hand, technical constraints were far more limiting to artists. We had to be really imaginative to perceive the artistic potential of the crude tools and techniques then available and make creative, intelligent use of them. At NAE, we have been working on pioneering, innovative Web design projects since 1994, and by publicizing our work and circulating our ideas, we have contributed to training a major contingent of professionals in this field in Brazil.

Being a shoestring, academic arts lab, and having university support to cover our basic running costs, we were always able to afford the luxury of choosing which projects we wanted to pursue. As a result, we work with a wide range of partners and clients. We have devised Web-based and multimedia projects for both commercial institutions and non-profit organizations, in Brazil and other countries (Figures 1, 2). Our motto is "never do what you already know how to." Each project must raise a new challenge, something to be researched, learned, taught to students and professors, and spread out into the community.

Over the years, our work has gained increasing visibility. We are often invited to present our ideas and projects on TV programs dealing with art and technology issues. Our opinions and achievements very often get space in the major national press, and we are often asked to participate in debates, juries and meetings relating to the arts and design.

Many of the educators who were part of the team in the early years still work with us. Many students who have already left, and are now professionals working at other institutions, still take part in many of our project meetings, either as guests or as active collaborators. We still share our original feeling of optimism. Looking back, we realize we really did open up new horizons for our students, but we still have a lot more to do.

Social Commitment and Responsibility: Electronic Art for the Real World

Two months ago, I came home to find my 10-year old daughter anxious to tell me what she learned at school that day. As she combed my hair with her small, delicate hands, she gave me a dramatic report on child labor in our country, where almost four million children from the ages of five to 14 are exposed to physical, psychological, and social hazards, and to intolerable forms of exploitation, often working long hours in unsafe, unhealthy conditions for very little pay. Her teacher had told them about the many children who have to carry 50-pound sacks of oranges on their backs to earn less than 50 cents a day. And about the thousands of children who work harvesting sugar cane, who often suffer serious cuts from the enormous knives they have to use to cut the cane with their small, delicate hands. She then looked deep into my eyes, her own eyes filled with tears, and asked me how she could possibly help change that situation. I told her: "You care. That's already the first and maybe the most important step."

Some years ago, I questioned the role of an electronic artist in a developing country. What is the point of producing art using expensive, sophisticated technologies in a context of extreme poverty and social inequality?[2]

In parallel with the projects for commercial or institutional use that we pursue at NAE, we also run a series of research projects on social issues raised by the emerging Internet society. Sponsored by research and development agencies and other public sector organizations, these projects are concerned with the relationship between Web design and economic, social, and cultural diversity, and with new media illiteracy in developing countries. Our project proposal (Internet, Illiteracy and Social Exclusion), which has recently been awarded the very special government grant Cientistas do Nosso Estado (Scientists of our State), focuses on the emerging actors inside, at the fringes of, or outside the Net society. As part of the project, we are currently designing a site to show how people living in different socio-economic circumstances in Rio de Janeiro perceive and understand the Internet, how it affects their lives, and its implications for their future.

No doubt one of the main challenges our digital world faces today is actually to incorporate the communities and groups sidelined by the connected society. "Only a fraction of people in the world have a presence in cyberspace; the rest are outsiders," says Hertz.[1] The

expanding use of computers in developing countries, alongside dramatic levels of poverty, deprivation, social exclusion, and violence, calls for careful analysis of the social and cultural specifics in each context, and discussion of the computer's impacts on less economically and technologically favored societies.[5]

Today, I consider it crucial to teach computer graphics in Brazil, not just for the sake of technological development and progress (there is no such neutral thing) but to improve the quality of life in our country. Although most of those who have access to high-end resources, including my students, belong to the upper layers of the economic pyramid, computer graphics is perhaps the main channel through which Brazilian artists and designers are discussing human needs and fighting for human rights.

Against all Odds

Seen from where we stand today, things looked a lot easier for us (computer graphics educators) before the astounding, overwhelming Internet boom. There were not as many plug-ins to download, techniques and innovations to learn, and digital newsletters and manuals to read as today. The information at our disposal was not so massive, relentless, and alluring. But, above all, there were fewer discussion lists and messages to reply to, every single day, and less guilt about when you just can't! Our days are much longer, if you include all those extra working hours we need to stay logged on at home to keep abreast of all the enticing information. And increasingly, our students know a lot more techniques than we do, for sure!

But the essence, the very nature of our educational practice has changed very little, or perhaps not at all. Overloaded and burned out as we always are with students'questions, assignments, meetings, and the constant need to stay current,[2] it can be quite easy to forget that basic, most fundamental reason for teaching: to prepare people to develop new ways to help bring greater quality of life to the world. That is what we, as educators, really need to focus on.

The Electronic Arts Unit is still located at that same small office (and we will remain there as long as our computers fit in the room!). We still see ourselves as a Brancaleone Army. But the unit is well known today as a special place where you will find interesting people, where you can experiment on new techniques and get information on contests, exhibitions, and conferences. It's a place where your opinions are welcome, and, most importantly, where you can let your ideas flow (because there's always someone there who believes in them).

Against all odds, it is a place where people learn how to cultivate their spirit of curiosity, improve their knowledge, and develop strong social commitment. Just the way we dreamt...

Notes

1. The results were presented at several conferences in Brazil, at SIGGRAPH 95, at ISEA'95 (Canada), and at SIGRADI'99 (Uruguay).

References

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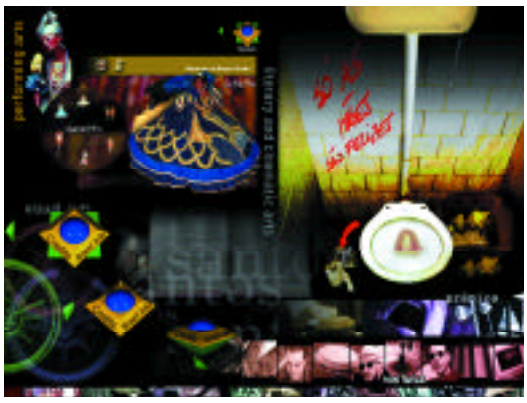

Figure 1. Examples of NAE projects (for Warner Records, Bar o Vermelho, University of Florida, Brazilian Foreign Ministry, Edi es Loyola, and INFNET).

Figure 2. Examples of NAE projects on social and academic issues.