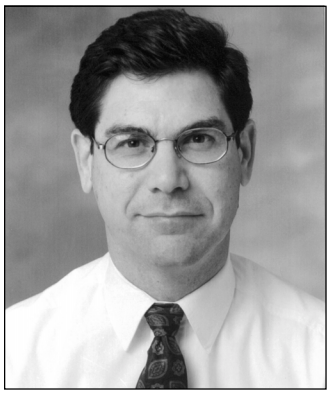
The Graphic Communication Curriculum for the Next Millennium



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In a paper on the condition of technology education in Russia, Bannatyne (1996) wrote:

> The principle goal of the Russian government seems to be to lift its economy and technical prowess to a level parallel to that which exists in the Western developed nations. However, while the developed nations of the West have a history of progressive educational and technological development, the schools of the former Soviet republics have failed to meet the requirement of training a technologically literate society that can meet the demands of the next century in many areas. (p. 12)

After moving to Russia to work shortly after the 1991 *coup d'etat* in Moscow, I had the opportunity to be engaged with Russian technology and education. My remaining five years there profoundly affected my understanding while diminishing my interaction with current technologies, ones we are accustomed to in the United States today. It also sent a clear message to me about how life must have been in Russia for the last 50 years. At least superficially, life in the larger cities changed as Western influences of digital technology began to invade Moscow and Saint Petersburg. However, as Bannatyne (1996) stated, the advancement of Russian technology and technology education for the masses had come to an almost complete standstill over the past 20 years. Except for a small core of researchers and university departments, progress has barely been noticeable.

By contrast, when I returned to the United States in 1997, I found a country more driven by technology than ever before. I was now in a position that required me to readapt to a more advanced techno-culture. As a graphic technologist specializing in graphic communication (GC) and visualization, I had to rethink and revise my skills and understanding of digital technology to match current graphic standards (Faiola, 1989; Faiola & DeBloois, 1988). I began to consider the impact of change in the GC industry. In retrospect, American society has become more sharply molded by technology than ever before. As the mark of technology has been impressed on every kind of human institution, it has become no longer a mere feature of convenience, but rather an incorporated necessity, interwoven into every dimension of life. For better or for worse, it has become, consciously or unconsciously, an icon of our American legacy.

From this perspective, technology trends and innovations have caused the GC industry to contend with an array of new problems. Technology has produced progress, controlled order, efficiency, and measured success, but it has also estranged many in the GC industry who are struggling to adapt to its advances. As we proceed into the next millennium, it is critical that GC educators address a broad range of important issues brought about by technology.

The Current Status of Graphic Communicators' Literacy

The GC industry is going through a radical reorganization in the workplace due to digital technology. Lewis and Konare (1993) suggested that because all facets of the GC industry have gradually shifted to digital operations, there have been increased demands on worker literacy. This has been especially difficult and stressful for workers who began their GC careers in the 1980s or earlier. Expertise in digital prepress, color management, digital printing, and networking/digital asset management technologies has heightened the standard for competency of domain-based knowledge in an industry that was once considered the most common of vocational trades. As printing firms begin to exchange old technology for new digital-based equipment, the type of employees has also changed. One firm I recently visited stated that its employees range from those who (a) required retraining and (b) those who came into the company with an adequate knowledge base for the daily workflow. For many in the GC workplace, however, technology is still difficult to assimilate because of the abrupt shift in graphic technology over the past 10 years. It has become a matter of survival for those included in this paradigm shift of production management and technical relearning.

Lewis' (1996) study substantiates this impact of technological transition on workers in the GC industry. He interviewed 48 individuals who included graphic arts instructors, printing managers, and workers in the industry. Lewis' study reflects the common daily account of workers' resistance to new technology. In his interviews, workers expressed their feelings about an industry that once provided them a sense of pride. Now, much of their labor-intensive skills have been handed over to a more advanced electronic process, which can do the job quicker, easier, and more

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accurately. As workers reminisced about the past technology, they mentioned that their vocation was becoming extinct at the expense of advancing technology. They viewed their trade as becoming a little more dehumanized for the sake of progress, and they lamented that there was little room for creativity, at least in the traditional sense.

Though there has been a good degree of success in retraining, workers from previous generations vary in their ability to assimilate new technologies. When I interviewed personnel at various GC firms, one remarked that older workers were more reluctant and slower in their response to be retrained, whereas the younger employees quickly assessed the situation and immediately volunteered for retraining. Of course, physical age, and intimidation of the unknown, played a major factor in all who responded. Today, however, with the assistance of the Graphic Arts Technical Foundation and Printer Industry of America, and numerous GC manufacturer training and college programs, traditional workers have the opportunity to upgrade their knowledge and experience of digital products and processes.

Rethinking Curricula, Reshaping Images, and Reeducating Educators

In the past 10 years, many GC programs throughout the United States have experienced low enrollment due to lack of student interest in traditional printing. By falling behind the industrial standard of current print and publishing digital technology, many GC departments have been forced to rethink their curriculum content. This reconsideration includes program image, recruiting techniques, and long-term planning strategies that can compete with college programs in multimedia and other areas of computer graphics (Goldrich, 1997; Vinocur, 1998).

The strategy of remarketing and reshaping a GC program image is necessary for every school that is serious about meeting the challenge of the newer and ever-advancing trends of graphic technology. In formal interviews and questionnaires given to experts in digital GC operations, they unanimously concurred that colleges must produce a new generation of qualified students who are equipped to meet the present and future standards of the industry. The difficulty lies in the fact that the traditional printing industry has a glamourless image. The out-of-touch high school or college guidance counselor may have an image of the printing industry as a windowless, dirty sweatshop. Though many institutions have redesigned their curriculum to match the trend of the current industry, GC educators must consider the advancement of print technology. Without addressing future industrial needs today, students will not be adequately prepared to adapt to a future GC workplace. Furthermore, there must be a campaign to reeducate high school counselors, college administrators, and guidance counselors so that they are aware of the new career potential of the digital future within the GC industry—what the digital GC industry needs in five to eight years. Based on this kind of reshaped GC curriculum, we then should advertise, promote, and sell our reconditioned program to area high schools, campus program counselors, and students who have undeclared majors at our existing institutes.

I recently developed a GC curriculum outline for Purdue University built upon market research that substantiated a need for providing an additional option within the Department of Computer Graphics. All indicators from industrial and academic experts clearly showed an overwhelming need for qualified graduates in all areas of the printing industry. At Purdue University, however, we have defined an option that goes beyond the past or present need in industry. Though it includes the traditional printing curriculum components as a foundation, it focuses on two aspects in GC that will become increasingly significant. The first consists of technology with regard to color, network, and workflow management, on-demand reproduction, and digital asset management. The second consists of visualization and communication problem-solving tasks.

I believe a more serious problem is whether graduates possess adequately applied problem-solving skills in digital management (Kahn, 1998) rather than mechanical knowledge of software. Too often learning is about bringing students in contact with the most recent technology rather than providing opportunities for them to engage their cognitive-expanding and creative-generating skills. It is the instructor's responsibility to balance the seductive aspects of new graphic technology by predicting that their present technical knowledge will become obsolete while their learned knowledge from creative problem solving will not. As prepress, press, and finishing processes become increasingly automated, critical thinking skills will become the industrial standard essential for job profiling.

Innovation, talent, and creativity should not be annulled by the pragmatism of technology. There is a growing distinction between basic vocational curriculum models that focus

primarily on the technical aspects of selected tools and the model suggested here. Of course, this is a point of contention within academia, where faculty differ on curriculum paradigms. Needless to say, the evolutionary sequence of events that is changing the course of technology education is upon us. When educators concentrate solely on domain knowledge and techno procedures to create artifacts, the effects on students' long-term learning skills will be limited and their job market value will be diminished. The challenge is how to solidify technical skills without impeding potential creative development.

The Need for Education and Industrial Collaboration

Providing students with educational-industrial collaboration in research and development (R&D) has the potential to offer another highly rewarding opportunity for students to increase their competency, exposure, interaction, and critical thinking skills with the sharpest cutting-edge GC technology available. Denning (1997) reviewed Wilhelm von Hulboldt's 1809 vision that universities are places of research, and those teachers must also be scholars and researchers. Denning pointed out that the ground under academic research is shifting because of the proliferation of scholarly publishing. The "publish or perish" syndrome, which pressures junior faculty to produce, has actually devalued the original purpose of university research.

Beyond new ideas there is the need for generating new practices, new products, and new businesses that come from collaboration between academia and the industry. More and more R&Ds will find their homes within university walls as industry recognizes the wealth of competency in faculty while at the same time finding that research is a factor to attract the best students. I propose an ongoing forum between academia and industry to discuss collaborative efforts in research and curriculum development for a major investment in the future of the GC industry (Ynostroza, 1996). This kind of revitalized relationship includes an R&D co-partnership and curriculum co-development that mutually benefits both sides while producing a more current program for GC students. From this kind of collaboration, faculty can accurately realign and redesign their curriculum content to match industrial need (Hurlburt, 1998; Goldrich, 1997; Meldrum, 1998; Mullins, 1995).

Conclusion

GC educators and professionals should jointly (a) consider the usefulness of the current curriculum model for a generation of workers in an ever-changing industry and (b) evaluate their existing relationships in research with the benefits of co-partnerships in product development. As we migrate from analog-to digital-based technology, all graphic information will be reduced to digital form. The demand for responsible information/image management in the GC industry will force educators to consider a new range of career behaviors. New paradigm shifts in industry based on market trends will dictate the need for GC programs to adequately educate students with course content that is techno-savvy and creatively challenging. Every dimension of education will evolve in methodology and pedagogical philosophy in a world that is dynamically networked via fiber optics and satellite workstations. The technology behind an integrated learning infrastructure will strongly influence the scope of how we receive, manage, and disseminate information assets in every facet of the print/publishing industry, for which GC educators must prepare their students today for the next millennium.

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