# Constructivist Approach to Teaching Motion Graphics

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# Abstract

Use of a constructivist approach in a new motion graphics course has resulted in unexpected outcomes. The participating college students were inexperienced with constructivist learning. Immersed in a paradigm shift, students had to adapt to the deliberate lack of direction. Learners improved their visual literacy in regard to video and animation. Participants created peer support systems to share knowledge and improve comfort levels. Students' shared knowledge bases not only improved learning on the class subject matter but also resulted in unanticipated transfer into other disciplines. These students were supportive of the self-directed approach in the creative disciplines. However, students did not produce at anticipated levels. Administration of the class was more time consuming than for traditional classes. In general, the class provided a singular learning experience with generally positive results.

#### **Planning the Constructivist Experience**

Institutes of higher education generally endorse expertise in the subject matter as adequate credentials to manage a classroom. Although experts in their field, most college faculty lack formal training in teaching. Most classes, as a result, are taught in a traditional manner. Professors lecture while students take copious notes and try to understand the information. Is this really the best way to learn?

The creative disciplines are distinct from the sciences and humanities. Art classes are often longer and rely on more individualized contact. They might, then, be more receptive to innovative pedagogies.

Last fall, although a formal class would not be offered until Spring 1999 a handful of students were hoping to explore motion graphics. A self-directed class seemed an excellent solution.

Constructivism is a way of "teaching" that acknowledges that knowledge is constructed by each learner through a complex interaction with the environment over an entire life span (Kearsley, 1998). This approach represents a major change of paradigm from the traditional perspective. According to constructivism, the classroom holds no special status: learning happens from interaction with any environment. The learner (not the instructor) is the central focus.

#### Introduction

All eight students officially participating in this program were seniors with a variety of graphic design experiences. The students had extensive fine arts backgrounds and were finishing a commercial art curriculum. Students at this level of the graphic design program have mastered vector and raster based applications and participated in internships. Most have undertaken freelance work.

In fact, all but one student had taken the required Electronic Prepress class and, therefore, had experience with the managing professor. Constructivism can be very different from the lecture-based educational experience. The lack of predictable, lecture sessions can leave students unsure of boundaries and expectations. The high amount of contact of traditional classes is a vehicle to build student/teacher trust. Limiting the class to seniors students was expected to increase student confidence with the unconventional structure. Further, all the students had worked with the professor in at least one conventional class. These factors helped to generate trust and understanding.

#### What Are Motion Graphics?

In the growing, converging graphic world, text and imagery are not enough. Increasingly text and images are being replaced with animations. This eye candy can exist in many forms. "Dancing baloney" refers to simple animations found on the net with no real message. These "flaming logos" of urban legend are generally drawn one frame at a time (the modern equivalent of cell animation) and assembled using free software. More complex animations are created as motion graphics or as 3D renders.

Motion graphics refers to animations created in a rasterbased (pixel) format. Clearly, motion graphics has its roots in traditional character generation, although the term "CG" now has a negative, unsophisticated connotation. In some circles, motion graphics works by assembling raster graphics, vector materials, and video footage into complex animations. Generally, these animations are output either to a live video compression scheme (like the Media100) or to low-bandwidth multimedia CODECs (compression/decompression systems like those built in QuickTime<sup>TM</sup>).

The public often confuses the worlds of motion graphics and 3D artwork. The term 3D is used to refer to models and materials which are created virtually using three dimensional systems, potentially animated and output in some 2D format.

The capabilities of computer-created 3D are somewhat more robust than motion graphics. However, 3D software is much more difficult to learn and 3D artwork is much more time consuming to create. Most animations and special effects can be created more economically and simply using motion graphics even when the appearance of simplistic 3D is needed. Basic 3D concepts such as perspective, depth perception, camera pulls, and spherize all are available within the realm of motion graphics.

Motion graphics offers a wealth of animation possibilities for the print or multimedia designer in a familiar environment with a gentler learning curve than 3D design. The results are impressive and very versatile in application.

#### Warning Labels

Because of the nature of this self-study each student was required to sign a contract agreeing to the expectations and obligations of the class. The constructivist experience is very different from the way most classes are managed. The contract was intended to underscore the unique structure of the class and to reinforce the responsibilities of the students.

All of the students discussed the inherent nature of the class with me several times and all stated that they were prepared and motivated for the self-study. And yet, almost all confessed discomfort in the first half of the class. Almost immediately, the participants could be observed having small informal meetings in the digital media studio. After two weeks of E-mail communication, a student with a rather average history asked for an informal "powwow" to discuss the class. We set up a Friday postlunch meeting time. All of the students attended, and we discussed their "agenda," which was comprised of almost identical topics to those covered when the class was being arranged. I asked the students if they felt better since we talked. All agreed that the meeting made them feel better. "Was anything new covered here?" met with a unique answer. The students stated that an initial class meeting was "required" in college and that without said meeting the class didn't "feel" as though it had begun.

#### **Contact During Course**

Informal meetings continued throughout the semester. Every few weeks, we would arrange a Friday brown-bag. These luncheons were relatively equally divided between question/answer sessions (in which students would seek advice, direction, and technical information), sounding board sessions (where students would ask others about ideas or directions), and purely social interactions. Students were very frank about the need to meet with me on a regular basis in order to get technical information and to stay motivated. Remarkably, I was communicating almost daily with most of the class via e-mail and saw them several times a week in the studio.

Even more fascinating, the students formed an inclusive peer network almost immediately. Students who were more technical provided a great deal of training and support for less experienced students. Students used each other as sounding boards for ideas and occasionally were observed role playing different tasks (art director, designer, professor, client).

#### Visual Literacy

One major goal was the acquisition of new forms of visual literacy. Students were asked to take a fresh look at the media around them. Fundamentally, design students become more astute and critical of the print media around them. Our graphic design students regularly remark that they will never see a billboard in the same way again. Clearly, extending these students' understanding of motion-based visual literacy was a primary goal. This appreciation took place almost immediately. When asked to reflect on professional and student-created animations, they became aware of subtle situations previously unappreciated. For instance, most video animations can be dissected into changing scale, rotation, opacity, and perspective of individual objects. With a new lexicon and way of thinking, students were able to envision how broadcast-quality animations are created. Remarkably, seeing animations on the computer screen instead of on film or on television made them much more aware and more critical. Students stated that it is easier to critique the materials in a "transplanted" format. Understanding the new component of time (the 4th dimension of design), made the creation of motion graphics possible.

#### Learning Contexts

To allow students to create their own animations and extend their learning, a motion graphics program was provided. Adobe After Effects was loaded on the computers in the digital media studio, and students were given a tutorial to learn basic operations.

#### **Student Dynamics**

Without exception, the students became closer on professional and personal levels. "Geek sessions" became a regular event. It was not uncommon for dinner out to follow these events. Occasionally, I'd be asked to come along as a consultant, although the agenda was usually managed by one of the students.

Although I made team projects an option, no team projects were undertaken. However, the group acted like a team in developing their individual projects and in interacting with "outsiders." Intellectual attacks by nonparticipants were often politely defended by others in the group.

The participant dynamic was also highly equitable. Distinct personalities were never observed to be a source of conflict, and leadership situations were divided fairly. The one natural leader in the group, for instance, never asserted himself. This may have been a result of "we hang together or we will surely hang separately" but also may have been the result of his rigorous academic schedule. This equitable situation may be unique to this group and not an inherent feature of the constructivist approach. The group did maintain the idea of having one permanent "spokesperson" to alert me to class needs and concerns.

#### Scaffolding

Considerable planning and effort was undertaken to create enough structure to allow students to learn new material (Fosnot, 1996). Scaffolding was designed to provide a knowledge base for students, to identify paths for further exploration, to make additional resources available, and to define assessment criteria. Although these efforts may seem excessive, students requested additional structure throughout the term.

It is difficult to underscore how much support was needed in the early stages of the semester. These eight students alone demanded as much time and effort as my entire two-course load and other faculty duties combined. The students communicated through E-mail (quite time consuming), one-on-one before and after other classes, and through semiofficial class sessions when requested. Although I had spent much time preparing handouts, lists of resources, provided free textbooks and elaborated considerably on tasks—students still needed a great deal of additional academic and emotional support.

Our program in graphic design is inherently selfdirected and allows students to determine the time required on-task. A few classes require "seat time," but most leave work style decisions to the learner. As such, students must find motivation and creativity within themselves in order to succeed. If students familiar with these two basic tenets find it difficult to acclimate to constructivism, consider how difficult it must be for learners in other disciplines.

Early in the class students experienced anomie. This lack of direction was resolved over time. In the second half of the semester, students "found [their] groove" and embraced constructivism. For example, students began the class seeking direction and requesting projects. In the second half of the class, students would inform me of their goals and projects. This change in perspective may seem slight, but it represents a fundamental shift in role, responsibility, and motivation. Late into the class, students expressed a real pride in their projects and the ability to direct themselves. Many students wished that many or all of their classes could be structured this way. One student stated that the freedom was dangerous and perhaps too different from her other educational experiences.

### The Generate Effect

Many scholars believe that students learn best when

the discover answers for themselves and are heavily involved in learning (Dykstra, 1996). This greater learning resulting in increased depth of processing is known as the generate effect. In this experience, the environment did maximize the generate effect. Because students were working without constant support, discoveries were made independently. These prideful moments were often shared with the group and with me. For instance, one project required the creation of rolling credits. A number of students asked me to remove this project from the sample project list. These students stated that the project was trivial or that it was very similar to a component of a project already in development. My agreement was informally broadcast to all members within hours. Students even endorsed the idea of selfdirected learning: their word choices showed an empowerment of "I learned," "I figured," and "I discovered...." The fact that students shared experiences did not conflict with this goal. Other students offered assistance when needed but not without solicitation.

#### **Developmental Projects**

The projects were designed to increase in size and complexity over the course of the semester. The initial timeline was oversimplified. The initial learning curve made early components of the semester less productive than anticipated. While students were acquiring the declarative and basic procedural skills, very little creative work was produced. Later, however, very large projects were undertaken. Almost all students proposed final projects much larger than anticipated. Given the freedom to direct themselves, these students went beyond expectations. Students requested seminars on developing multimedia portfolios and other topics head and shoulders above the requirements. Freedom to self-select may result in greater effort and greater success than teacher-directed projects.

Another work load factor was even more surprising. Students used their developing skills for other classes. Half of the students were observed using After Effects to develop graphics, web objects, and storyboards for other classes. Rather than provide storyboards for an advertising promotion in business class, two students roughed out the commercial and created animated graphics to support the video and stills.

### **Quality Issues**

Almost all projects lacked the polish expected from senior design students. Although troubling to some other faculty in the department, this seemed to be a response to learning new, electronic skills. When computers are introduced to first-year students and sophomores in design, they temporarily lose touch with their creativity. This trend seems to last while they work through the initial



a screencapture from Adobe After Effects showing the project window (upper left), composition window (upper right) and animation timeline (bottom).

procedural issues relating to the technology. After their first semester they begin to reverse the trend. In essence, their early designs are based on what the computer can do; later designs are based on what the computer can do for them. This "laser-trash" effect seems to affect motion graphics users as well. Students spent this first semester mastering the environment to the detriment of their creative concepts. Work completed over subsequent months demonstrated a better balance of creative and technical.

# **Real-world Skills / Procedural Focus**

Students did develop substantial real-world skills. The learners completed medium-sized projects and demonstrated mastery of a complex toolkit. Many of the students proposed a laundry list of future projects that will involve motion graphics in some way. Two are working at least part time in motion graphics, and one has just finished a mammoth multimedia project in After Effects. The growth in interactive multimedia, availability of video on the desktop, and the never-ending demand for kitsch on the internet make motion graphics a growing field. A constructivist class makes it easy to create a transfer appropriate environment.

# **Pitfalls of Low-structure Courses**

It would be unfair to be utopian in these claims. For example, one of the most successful students recently confessed to having missed a fundamental feature of After Effects. The learn-as-needed paradigm often results in learning only what is critical for the moment and learning any one way to accomplish a task instead of the best way. I believe a series of debriefing sessions could help. The "just-in-time" aspects of the class create a good-enough mindset where students equate any solution with success and mastery. Having students share their techniques might give students a broader perspective. Similarly, more declarative activities—such as lectures and demonstrations—at the end of the term could improve the breadth and value of the class while still retaining the majority of the self-motivating components.

#### Conclusions

Constructivism appears to offer unique advantages over lecture-based teaching styles. As in this case, courses can be offered as trial runs and to small classes of students. The human dynamics can be engaging and positive. Students ended the course satisfied; many appreciated the freedom and learner-centric focus, although earlier in the semester this freedom felt to most students like falling without a net. It isn't easy to overcome 16 years of instructor-centric education.

Two other caveats are worthy of note. First, the creation and execution of this course proved to be extremely time intensive even with very few formal lectures. Second, students demanded a high degree of structure. I had developed a comprehensive infrastructure to provide scaffolding. Nonetheless, the students requested much more structure than expected. Constructivism offers tremendous potential to sculpt students in novel ways; yet it should not be undertaken lightly.

#### References

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