IN THE COMPANY OF DESIGNERS:

EXAMINING THE CULTURE OF DESIGN IN THE DESIGN STUDIO

by

DOUGLAS RAYMOND HOLSCHUH

(Under Direction the of Thomas C. Reeves)

ABSTRACT

In the fall of 2004, Sonic Design, a student team of instructional and multimedia designers in the Master's Studio of the Instructional Technology Department at the University of Georgia, participated in a study to get a better understanding of how design was being done in a student-centered design-studio learning environment. This study examined how the Studio fits into a community-of-practice framework, how the students' designing was affected by the design of the course, and how the students constructed their identities within the Studio culture.

The following questions guided this research: (a) How do theories of communities of practice explicate the way students engage in and negotiate design of an authentic design project within a team-based context? (b) How is the way in which students conduct design within a team-based context influenced by the design-studio model? (c) How do students come to identify themselves as members of the culture of designers in the design team, in the Studio, and in the larger cultures of instructional and multimedia designers? Where and how is value assigned within this culture?

To answer these questions, an ethnographic study was conducted with the researcher observing a three-person design team in the last course in the Studio sequence. This design team

was responsible for securing a client and designing and developing computer-based instructional modules in consultation with the client. The team that was studied, the Sonic Design team, created three modules to help grade-school students with moderate to profound intellectual disabilities learn about money, dressing for the weather, and finding services in their local community.

Based on a semester's worth of observations, interviews, and artifact collection, the study discussed several findings related to the research questions, including how designed and emergent forms of community creation influenced the Studio, how peer masters functioned as instructors for newer students, and how students identified as designers, developers, teachers, and IT professionals.

Finally, the study presented implications for future implementation of the Studio model, including increasing rigor through instructor-led design critiques and fostering the role of peer masters. Additional implications for future research included implementing some of the teaching changes in a design-research study and conducting more research on Studio students once they leave the program for occupations in the field.

INDEX WORDS: Instructional Design, Graphic Design, Multimedia Design, Design, Development, ADDIE, Design Studio, Architecture Studio, Communities of Practice, Legitimate Peripheral Participation, Identity, Instructional Technology, Constructionism, Constructivism

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DEDICATION

To my wife, Jodi, my biggest fan and without whose support and encouragement, I never would have finished. And to my children, Maia and Samuel, who were far more understanding about Daddy going to work on his dissertation than children should have to be.

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CHAPTER ONE

INTRODUCTION

In the fall of 2004, Sarah, Tamieka, and Jing, as members of the Sonic Design team, began and completed their journey as a multimedia instructional design firm in their last course in the Studio, the core learning environment for the M.Ed. in Instructional Design and Development in the College of Education at the University of Georgia (hereafter, "the Studio"). This is primarily their story, but it is also the story of the whole Studio – what it is and where it came from, how it was designed and how it is implemented, and in general, how it works from the perspective of the students. It is also a story of how instructional technology faculty members and graduate teaching assistants educate and train future instructional designers, and how these students become active members of the community of practitioners within the field of instructional technology. Finally, it is, in part, my story as a student, then researcher, then instructor in the Studio.

Rationale and Significance

The search for innovative learning environments is a primary focus of the field of instructional technology. Some of these environments are creations that come about thanks to a technological change that we wish to address. Others are creations that are inspired by learning as it occurs in other professions and educational fields. The lineage of the Studio can been seen as

a multidisciplinary extension of the architecture studio – the core of architecture education for the past century and a half, dating back to the Ècole des Beaux-Arts in Paris in mid 19th century.

Despite decades of use and modifications, however, little to no research has been done on this method of instruction, primarily because the traditional design fields that have used the studio method are not predominately concerned with pedagogical issues, at least not with the research focus on instructional design held in the field of instructional technology.

In 1998, several of the faculty members of the Instructional Technology Department at the University of Georgia looked at the architecture studio and saw it as something that would fit into their constructivist-based ideas on learning, and they revamped their Master of Education program, changing it from a traditional series of independent classes to an integrated sequence of classes within the single core of the design studio. The Studio was intended to redefine the education of instructional designers, moving it from a traditional classroom-based approach to one that is more authentic to the work world the students will enter upon graduation.

Surprisingly, despite a growing interest in the use of the design studio for the training of instructional designers and developers (Boling, 2003; Hoadley & Kim, 2003; Jonassen, 2003; Orey, Rieber, King, & Matzko, 2000; Rieber, n.d.), there have been few studies of team-based design in the design-studio learning environment. Outside the field of instructional technology, there are several studies discussing the implementation of design studios – computer science (Docherty, Sutton, Brereton, & Kaplan, 2001), human-computer interaction (Reimer & Douglas, 2003), management information systems (Carbone & Sheard, 2002) – but again, little research has been done examining what is happening within the environments. Studies can be found that

look at team-based design in industry settings – aerospace engineering (Baird, Moore, & Jagodzinski, 2000); electronics engineering (Jagodzinski, Reid, Culverhouse, Parsons, & Phillips, 2000) – but these are not examining student teams in a learning environment. If the design studio is to have a future in instructional technology, a much deeper understanding is needed about the cultures of learning and instruction that arise when such environments are implemented.

The examination of the design studio in instructional design could be approached from many angles. As a former student, a graduate, and a once-before researcher of the Studio (as well as an occasional instructor), my interests leaned toward a descriptive study of the culture of the design studio. As a student, I noticed that some students seemed to thrive in the Studio, whereas others did not. I started thinking about how a student successfully makes the transition from student to professional: How a student, over his or her time in the design studio, identifies as a designer. In my first foray into studying the Studio as a researcher, I sought to get students to talk about design. My interviews in the fall of 2003 made me aware of the tension between the different types of design that were required for and valued in the class. An authentic environment like the Studio uses an interdisciplinary approach, which pulls in skills from various disciplines, including many different types of design (instructional, print, web, message), without necessarily exploring the differences and similarities between these different types of design. This finding brought up other questions such as what do we mean when we say "design," and what type(s) of design should we be teaching to our students? There is a large body of literature, outside of our field, on design studies and by beginning this inquiry, we can move instructional

technology toward becoming more of a design field, one that actively seeks to benefit from the knowledge of other such fields. These interviews also made me realize that interviewing was not the right approach to understanding the Studio, and that a more immersive method would be needed.

Finally, I had the opportunity to teach in the Studio, as a teaching assistant for EDIT 6200, after my data were collected but before I finished my analysis and writing, and this experience gave me new insight into what I was looking for in the Studio. During the semester in which I taught, I realized how little I knew about what was going on with the students' work. I actually saw more of the week-by-week progress and activity of the students as a student than I did as an instructor, and it made me realize how all learning environments have a student culture that is hidden from the instructors. The Studio has this even more, because so much of the work is done independently of the instructors and outside a traditional classroom environment. I began to think about (and rethink) what I could describe about this world.

For this study, I employed an ethnographic approach to examine design teams in the Studio. This is an accepted manner of inquiry for design teams outside of education (Baird et al., 2000; Ball & Ormerod, 2000; Jagodzinski et al., 2000; "Viewpoint," 2000), and such an approach to the Studio provided a deeper understanding of the learning environment and the culture of learning that developed from one of our designed environments. As is typical of qualitative research, I focused on *how* questions, the answers to which not only enabled me to develop the desired level of insight into the Studio, but also provided an empirical foundation that can be

viewed as a precursor to more studies both in a design-studio environment and in team-based instructional design and development in business, industry, and elsewhere.

Ethnography often combines both an emic perspective, which inductively grows out of the data and represents the participants' view of their culture, and an etic perspective, which gives an "external, social, scientific perspective" (Fetterman, 1989, p. 32) to the data. Whereas the emic perspective for this study came primarily from my collected data, much of my etic perspective was formed by viewing the data through a framework of communities of practice (Lave & Wenger, 1991; Wenger, 1998), which looks at the interplay of people, social organization, and the work they undertake. This framework puts emphasis on the lived activity of individuals and groups through sociocultural perspectives on learning and thinking.

In the design studio, we want students to start thinking like designers, much like other educators want their students to think like mathematicians or scientists or historians. Coming at this from a community-of-practice framework, I reframed this idea of "thinking like" a designer as how students come to identify as designers within a community of designers. We need to know how students become successful designers, and how teams and the design studio facilitate and influence that identification and their practice of design, so we can do a better job at nurturing the development of creative, competent designers.

Purpose of the Study

The purpose of this study was to examine how students learn design as part of a team using a design studio–based approach to learning. This study examined the Studio through a naturalistic, descriptive approach influenced by sociocultural theories of communities of

practice. As such, it studied the design culture that exists in the Studio, and how that culture has been created and fostered by the learning environment. More specifically, it explored how design was done by a single design team in the Studio in the fall of 2004. This design team can be seen as representative (albeit an exemplary representation) of numerous other teams that have completed the Studio, but it obviously had its own unique characteristics as well.

Research Questions

The following questions guided my research:

1. How do theories of communities of practice explicate the way students engage in and negotiate design of an authentic design project within a team-based context?
2. How is the way in which students conduct design within a team-based context influenced by the design-studio model?
3. How do students come to identity themselves as members of the culture of designers in the design team, in the Studio, and in the larger cultures of instructional and multimedia designers? Where and how is value assigned within this culture?

Chapter Summary

For this study, I observed a single design team working on their final project in the Studio in an effort to better inform our efforts at the training of future members of our field, and to make us more aware of what we are doing in our own learning environments, which will make us better able to help both our field and other fields with their educational needs. This study has yielded a better understanding of the dynamics of a design-studio classroom and the culture of

design that develops in such an environment. This work and additional work in this area could lead to better implementation of such environments at the University of Georgia and other institutions, and a better understanding of design and the design process as it is taught to and learned by student designers in our field.

Chapter 1 provides a brief introduction to this study and this document, as well as the background of the study including a look at my own background and reasons for conducting this research. Chapter 2 reviews the literature that applies to this study. Chapter 3 provides the full methodology of this study, which is based on ethnographic and other qualitative research methods. Chapter 4 provides the primary narrative of the experiences of the Sonic Design team in the Studio. Chapter 5 provides the analysis and interpretation of the collected data. Chapter 6 concludes the study and includes implications for future research.

CHAPTER TWO

LITERATURE REVIEW

The purpose of this chapter is to review the literature related to the practice of design and the formation of identity in a design-studio environment. It is divided into four sections: (a) defining and doing design; (b) the design studio and its use in educational settings, (c) communities of practice as the theory applies to design studios and designing, and (d) identity in practice.

Scope of the Literature Review

For this literature review, the major research journals including *American Educational Research Journal, Communications Education, Design Studies, Educational Researcher, Educational Technology, Educational Technology Research and Development,* and *TechTrends* were examined. The primary resource I have consulted in my search is the University of Georgia Library, using the GIL and GALILEO databases. Additionally the Google Scholar search engine was used to locate texts that could not be found elsewhere. Using these tools, I have searched for the following key words: design studies, design studio, architecture studio, architecture education, communities of practice, ethnography (of design and design teams), design team, instructional design, training and education of instructional designers, ADDIE, legitimate peripheral participation, identity in communities of practice, constructionism. Wherever possible, the literature reviewed for this chapter includes refereed journal publications and

papers from refereed conferences. However, when needed (and this was often the case when searching in the architecture literature), non-refereed sources such as books, non-refereed journals and magazines, and web-based materials have been included.

Design

For the past several years, my family and I have been vacationing on the southern Gulf coast of Florida, and one of my favorite things to do there is to take an evening trip to Main Street Books in downtown Sarasota. The last time I was there, I walked in and saw a table of books labeled "Design." Rushing over to check out what I could find, I discovered that all the books on the table were about interior design: remodeling your bathroom, resurfacing your kitchen cabinets, choosing a paint color for your bathroom. There was nothing on art, nothing on architecture, nothing on graphic design – nothing, in other words, on the type of subjects that I associate with the word "design." It made me realize how difficult it is to define this single word. "Design" is a word with so many layered meanings in so many different contexts that it naturally lends itself to confusion.

Defining Design

Design is an "ambiguous" concept (Winograd, 1996, p. *v*), so akin to artistic creation and "god-given" talent (the mistaken belief that that great designers, like great writers, are born not made), and yet more technical, more systematic. To complicate matters, design is used in so many disparate domains that common ground in them is hard to find. A good definition, however, would cut across all these fields – a partial list including software design, graphic

design, interface design, web design, architectural design, engineering design, industrial design, and yes, even interior design – and look for commonalities.

Perkins (1986) split design into both noun and verb to differentiate the thing – "a structure adapted to a purpose" (p. 2) – from the doing, which involves "answering the design questions as one proceeds" (p. 94) through the creation of the structure, For Perkins (1986), the design questions are, in general: "(a) What is its purpose (or purposes)? (b) What is its structure? (c) What are the model cases of it? (d) What are arguments that explain and evaluate it?" (p. 5) Perkins used these questions as the basis for his investigation into design in a very broad sense, looking at the design involved in such activities as writing, argumentation, and other non-design areas.

Winograd (1996) dispensed with the "thing" altogether: "Although we label it with a noun, design is not a thing. The questions that we can ask fruitfully are about the activity of designing." (p. *xx*): "Design is also an ambiguous word. Among its many meanings, there runs a common thread, linking the intent and activities of a designer to the results that are produced when a designed object is experienced in practice" (p. *v*).

Winograd (1996), too, saw design as answering questions or making decisions:

> Whenever objects are created for people to use, design is pervasive. Design may be done methodically or offhandedly, consciously or accidentally. But when people create software – or any other product – decisions are made and objects are constructed that carry with them an intention of what those objects will do and how they will be perceived and used. (p. *xv*)

Winograd (1996) also outlined the characteristics of design: Design is conscious, is a search for creative solutions, is a balance between technology and humanism, is a conversation with materials, is iterative, is creative, is communication, is a social activity, and has social consequences.

For Gargarian (1996), design is "concerned with problems [best described as] open-textured" (p. 128), a phrase he borrowed from Gardner (1987). As an example of "open-textured," he noted how "lawyers are not governed but *guided* by rules" (p. 128). Gargarian (1996) stated that "In designing there is no way to plan a path toward a solution if what constitutes a solution is, itself, under debate. The solution to designing is *emergent* rather than planned because the designer is learning what a 'problem' is about during the design process" (p. 130).

Gargarian (1996) also described design as reflexive in that "the way one interprets a problem (legal, musical, or otherwise) has implications for what facts are relevant or irrelevant, what previous experiences one uses to evaluate it, what new facts these previous experiences uncover, and so on" (p. 129). We change the design because we are involved with the design. Our past and current decisions affect future decisions. Gargarian (1996) described this effect as reflexivity, a "dynamic process in which future judgments are progressively adjusted to accommodate the effects of past judgments" (p. 130).

Doing Design

Gargarian (1996) stated that "Designing is in large part redesigning" (p. 128). Problems occur during design that were not foreseen, and a designer has to construct strategies to

overcome these problems. That is why "designers are always redesigning" (p. 130). Given a continually iterative process, Gargarian (1996) asked how a designer can tell whether progress is being made on the design. He decided that a designer did this by "controlling design complexity" (p. 127); that is, "the designer keeps the emerging artifact from requiring skills he does not have or cannot construct 'on the fly.'" (p. 127); and (b) by "promoting user utility" (p. 127), that is by keeping the "emerging artifact from becoming unusable" (p. 127).

Gargarian (1996) included the construction of strategies to solve design problems as an integral part of the design process, and he distinguished between two types of design skills: (a) *environment design,* where the designer is "constructing skills and organizing those he thinks he will need"; and (b) *artifact design,* where the designer is "using the skills he has already constructed" to build the structure (p. 128). According to Gargarian, the best designers are those who can "take charge of the skill construction and management processes." (p. 128)

A meta-skill necessary for good designers, according to Gargarian (1996), is the ability to find freedom in restriction:

> Designing requires restricting design…. Without restrictions,… he would be paralyzed. What I call *freedom in restriction* is the counter-intuitive notion that restrictions provide the designer freedom rather than enslavement. Within a restricted collection of choices, a designer can explore possible choices using trial and error or algorithmic methods. (p. 132)

A second meta-skill is confidence building:

> Reflexivity explains why designing – in search of truth, value, or beauty – is a process in which provisional solutions serve as a means of further discovery. Still, designing imposes restrictions that become intractable. For this reason, designers are continually evaluating the restrictions they impose on their process. *Confidence building* is about how restrictions earn their credentials through use. (Gargarian, 1996, p. 132)

As an example of this meta-skill, Gargarian cited Sloboda (1985) who looked at music composers and observed how they tightened or loosened constraints on their compositions based on how difficult the progress of the composition became (Sloboda, 1985, pp. 123–138). Composers then ranked these constraints based on how productive they made them. "Alexanders' idea of *design fitness* is a similar idea (1964). Design fitness is the harmony created between an ensemble and any of its parts…. If the suit and tie do not match, it is the tie, not the suit, that must be replaced. This is because the design investment is greater in the suit; it is ranked higher …" (Gargarian, 1996, p. 133). As lesser design elements get replaced, and solutions to the design problems get solved, the designed structure becomes "increasingly permanent" (p. 133) and eventually finished.

The Design Studio

Docherty et al. (2001) described their field, computer science, as a design field because computer science is best described as a "wicked" problem (Rittel & Webber, 1973). A wicked problem is one in which the problem and the solution are inseparable; each attempted solution throws new light on the problem, exposing more problems that were never previously

considered; you never know that you have come up with the optimal solution; and you stop working when you develop a solution that is "good enough." This idea aligns with Gargarian's (1996) reflexivity. "Wicked" may perhaps be the best descriptor I have identified of education in general and instructional technology specifically. Architectural and industrial design have long struggled with their wicked problems through the use of a design-studio model of pedagogy, and Docherty et al. (2001) puts forth the design studio as a good approach for computer science. They want to treat computer science as neither science nor engineering, but as a design discipline.

Origins in Architecture Education

To understand the design studio it is necessary to look at its development from a historical perspective. The design studio has been used for more than 100 years as the primary teaching method for the field of architectural design in the United States (Reimer & Douglas, 2003). A design-studio approach to teaching "has long been the norm in disciplines where the nature of practice is the development of abstract artifacts that are used by others. Design studios, and the attendant teaching mode of mentor and coach, can be found wherever art, interior design, architecture, graphic design, etc., are taught" (Docherty et al., 2001, p. 3).

The design-studio model began to replace an older apprenticeship system in architecture education in the mid-19th century. The founding of the Ècole des Beaux-Arts in Paris in 1850 was the beginning of the use of the design-studio model in Europe, and American graduates of the school soon brought the teaching model to the United States, with the first schools being founded at the Massachusetts Institute of Technology and Columbia University (Koch,

Schwennsen, Dutton, & Smith, 2002). By the beginning of the 20th century, the Beaux-Arts–style design studio was the standard means of architecture education in this country.

Fisher (2000) noted:

> Architecture's studio-based pedagogy originates, in part, from eighteenth- and nineteenth-century French rationalism, which held that through the analysis of precedent and the application of reason we could arrive at a consensus about the truth in a given situation. This rationalism underlay the teaching methods of the Ècole des Beaux-Arts, brought to the first schools of architecture in the United States by architects such as William Ware and Richard Morris Hunt…. Many of the features of today's design-studio … were begotten by that 150-year-old system. (pp. 69–70)

These features include (a) beginning with a problem that the students need to solve, (b) approximating the real world of practice in the design studio, (c) using a step-by-step process of design, (d) using the showcasing of draft and final projects as a medium of communication, and (e) evaluating final designs by a jury of masters (Cuff, 1991).

In the 20th century, The Bauhaus school of design and the corresponding movement in art and architecture transformed the nature of design-studio education, first in Germany, where the Bauhaus school operated from 1919 to 1933, and then in the United States, once the school was closed by the Nazis and many of its founders fled to the United States. Beginning in 1937, when Walter Gropius came to Harvard University and Mies van der Rohe came to the Illinois

Institute of Technology, the Bauhaus curriculum began to supplant the Beaux-Arts curriculum that had dominated in the United States until that time (Cuff, 2000; Koch et al., 2002).

Fisher (2000) explained the dynamics of this change:

> Overlaying [the] rational French tradition in the architectural culture is an idealistic German one…. The attention paid to star designers, the focus on current styles, the striving for freedom from constraints, the historicist nature of architectural theory, and the tendency to polarize education and practice all echo the Hegelian beliefs that history moves through the work of a few great individuals, that every period has its characteristic styles, that history is moving toward maximizing the freedom of every person, and that cultures progress by a process of synthesizing polarities. (p. 70)

These characteristics can all be seen in the modern architecture design studio in the United States. Reimer and Douglas's (2003) term-long study of a university architecture studio recorded the following additional characteristics: Design studio courses were in addition to "regular lecture" courses, and they met three times a week for 4 hours at a time. Design studio classes were divided based on skill level, and each class was composed of 10 to 12 students. Students were given real-world problems that had to be solved using an iterative design process, and each week the instructor emphasized a specific aspect of design. Students worked alone or in teams, depending on the class. Each student was assigned a desk and work area that was theirs for the whole semester, during both in-class and out-of-class times. In each class, the students spent

most of their time working on their projects, except when they had to meet with the instructor for weekly design critiques.

The design critique, or crit, is such an integral part of the architecture studio that it deserves separate mention. The crit is the "central means of conveying design knowledge" (Reimer & Douglas, 2003, p. 194). The process they observed involved two to four students gathering in a central area to show their work to the instructor. Designs were often "low-fidelity" (i.e., drafts rather than polished) work, so changes could be easily made or mistakes could be easily thrown out. Crits were primarily instructor led, with the instructor giving the feedback and asking questions, and the other students watching passively. During a 20- to 30-minute crit for an individual student, the student pinned up and presented her work and rationale for the design. The instructor generally began the review positively and then used Socratic questions to highlight weaknesses in the design. Then the instructor gave suggestions for revisions to the design and answered any questions from the student. Finally, the instructor gave feedback on the actual presentation of the work. During this time, the other students seated for this crit simply "listen[ed] and learn[ed]" (Reimer & Douglas, 2003, p. 194).

Mid-term and final pin-up sessions took the place of traditional exams, and they occurred in front of the whole class. For the mid-term, two faculty members and one peer reviewed a single student's work for 30 minutes. For the final pin-up session, an invited professional architect gave a review of each student's work. Grades in the design studio were pass/fail to encourage collaboration between students.

Reimer and Douglas (2003) noted that the architecture studio (a) involved experiential, immersive pedagogy; (b) integrated prior knowledge acquired from the students' standard lecture courses; (c) had students produce real-world artifacts using real-world design processes taken from professional practice; (d) was a student-centered environment where students were active learners with teachers as resources or coaches; (e) emphasized collaboration as a key process between teacher and student, and student and peers; (f) based assessment on students' presentations of design artifacts; (g) was an intense and highly interactive learning environment between students and teachers, students and students, and students and professionals; (h) taught primarily through the design crit; (i) emphasized communication of design and reflection on both the product and process as critical to learning; and (j) involved specialized studio rooms and scheduling. Reimer and Douglas (2003) cited this architecture design studio as an example of "social constructivism applied to education" (p. 195), which educational researchers could further clarify as a constructionist pedagogical approach (Papert, 1980) combined with the creation of a community of practice (Lave & Wenger, 1991) focused around the identity of becoming a designer.

Current educators in architecture see both positive and negative characteristics growing out of the design-studio model of architecture education. Fisher (2000) has noted that the design-studio model fosters, "the unquestioned authority of the critic, the long hours, the focus on schematic solutions, the rare discussion of users or clients" (p. 70). Architecture, even with its long history of design-studio use, finds itself refining its definition of studio. Cuff (2000) saw the need for a revision to the studio for several reasons. She noted how the gap between architecture

faculty and practicing architects (and the difficulty of being both) makes it difficult for true master architects to lead most studios. Moreover, when true masters are brought in, it is for shorter and shorter periods of time. She also noted that faculty are not as proficient as their students are in the latest technology: "The paperless studio is here; it awaits the paperless faculty" (Cuff, 2000, ¶ 11). Finally, Cuff noted how architectural practice has changed and is changing so quickly that the studio is not keeping up. She pointed to team teaching and reformulations of the studio, sometimes in online spaces, as evidence that the studio will continue to be the center of architecture education, albeit in a changed form. Other experiments in the architecture studio involve a move away from the theoretical and further into the world of practice, such as a push for architecture students to not only design but also build projects while in school (Erdman & Weddle, 2002).

A major impetus for studio reform is a report from The American Institute of Architecture Students, *The Redesign of Studio Culture* (Koch et al., 2002). In this document, students noted that they want to keep the best that studio has to offer, while getting rid of those elements that push students toward extremes in their work and their lives, such as the belief that you have to live in the studio to succeed. (As an example of the extreme culture, they noted a common T-shirt worn by architecture students reading, "Architecture students do it all night long" – a sentiment that could apply to the Studio in instructional technology, at least toward the end of the semester.)

The Design Studio in Other Disciplines

The design studio has found its way into fields other than architecture. These experiments with the design-studio model have been very limited, however.

Computer-Science Studio

In 1999, the University of Queensland (Australia) began to use a design-studio approach to teaching computer science (Docherty et al., 2001). The 3-year bachelor's degree (4 years with the optional honors component) consisted of a tightly scheduled sequence of courses in four main areas, or "streams" (as they labeled them): computer science, design, information environments, and an integrated studio component during every semester. The first stream, computer-science, was a standard computer-science curriculum.

The second stream, design, was designed to foster skill in four areas "not typically found in a technical degree program" (Docherty et al., 2001, p. 234): generative thinking skills, observation skills, production skills, and integration skills. For generative skills, Queensland used a visual-thinking class to help students who were strong in "verbal reasoning, symbolic manipulation, logic, and reductionist problem solving" (Docherty et al., 2001, p. 234) develop an attitudinal shift toward the creation and generation of ideas, an "expansive thinking mode" in which "non-designers are often uncomfortable" (p. 234). To foster observation skills, the program used ethnographic techniques, drawing, and improvisational drama to increase students' sensitivity to the human factor of problems and solutions. The hands-on skills needed for prototyping design solutions for different problems were the center of the production skill area. Finally, the integration of design skills and ideas with real problems and projects was

developed more fully in the design-studio component. It should be noted that, except for integration skills, these skill sets were not being taught in the actual studio, but in parallel courses.

The third stream was an information-environments stream, which tied in with the observation skills of the design stream, but also included historical and social issues in the design of computer software and solutions.

The fourth stream was the design studio itself. The Queensland computer-science studio was modeled on the architecture studio. Two projects per semester were completed, each lasting 4 or 8 weeks. Projects in the studio were tied into larger "teaching/learning" (Docherty et al., 2001, p. 235) blocks that included seminars and lectures in other classes in the same semester, as well as one or two workshop weeks at the beginning of the semester where students could learn the new tools they needed to complete their projects. A final public presentation of the projects (with individual feedback) was preceded by several interim presentations to small groups in the studio. As with a traditional architecture studio, the Queensland program put an important emphasis on space, and specific studio spaces were allocated to allow collaboration and the fluid movement of students in and out of teams as needed.

The computer-science degree at Queensland attempted to create a student-centered learning environment where students are actively engaged with their learning. Although reporting some resistance from the first year of students, especially in the course designed to facilitate generative thinking, because of traditional expectations of a computer-science program, the authors noted that the second year of students were choosing the program because of its

unique design. The program also brought about more collaboration among the faculty as they adapted to the new, more flexible environment. All in all, the authors considered their program a successful translation of the architecture studio into the computer-science curriculum.

Human-Computer-Interaction Studio

Reimer and Douglas's (2003) implementation of a test design-studio model in their human-computer interactions curriculum was a limited version of the original architecture studio that they had observed. Not able to change class times, the class only met twice a week, for 50 minutes and for 110 minutes. Because the students were not in a curriculum where the studio was integrated with lecture classes, mini-lectures (covering new content) were given within the studio class time. Additionally, class time was used for design crits, but no class time was allotted for working on projects, and all work was done outside of class. Additionally, there was a lack of permanent, individual space for each student in the studio classroom. Grades were computed, based not only on projects, but also on participation and pop quizzes. Despite all this, the researchers and students were happy with the results, although the researchers did note that students did not keep up with the assigned reading, because of the time required for the projects. A similar human-computer-interaction design studio, initially set up by Terry Winograd at Stanford University, followed the architecture studio in most ways but deviated with the addition of a reflexive "idea log" (or student journal) worth 35% of the grade (Verplank & Curtis, 2003).

Management Information Systems

The Bachelor of Information Management and Systems at Monash University (Melbourne, Australia) began the transition to a "Bauhaus School of Design" studio approach in

2000 (Carbone & Sheard, 2002). They had success with student engagement and enjoyment, as well as an increase in students' metacognitive skills, although the evidence of this was anecdotal only.

Instructional Technology

In addition to the Studio at UGA, some implementation of the design-studio model has been used in the field of instructional technology. Hoadley and Kim (2003) described the Learning Design & Technology (LDT) program at Stanford University, which "is a 12-month master's program in the School of Education where students come together as a community of practice around becoming 'learning designers'" (p. 511). They noted that the studio model "dovetails with other modern instructional techniques" (p. 514), notably, problem-based learning and case-based learning.

The Studio at the University of Georgia

The Studio was created in 1998 by current faculty members Lloyd Rieber and Mike Orey and retired faculty member Jim King (Rieber, Orey, & King, 2004). The impetus for its creation was the change at the university from a quarter-based schedule to a semester-based schedule and the freedom this gave departments to revise their course offerings. Before the master's degree in instructional technology was based around the Studio, separate courses were offered in areas such as advanced graphic design and message design, but the thought was that these classes taught the skills in isolation from each other, and although students did well in them, they were not able to integrate the knowledge and skills gained with other courses and with the real-world work they would be pursuing after graduation. "Part or our goal for The Studio was to create a

learning culture that went beyond the boundaries of a typical 3-hour class and classroom" (Orey et al., 2000). Additionally, the traditional build up of knowledge throughout a course left little time at the end for students to create an actual project based on this knowledge.

From Orey et al. (2000):

> We refer to the new curriculum as The Studio experience because it is borrows, at least metaphorically, from studio models historically found in schools of art and architecture. All studio models share certain key features (D.W. Schaffer, personal communication, 1998). First, students work on open-ended projects in depth, over time, and with significant control over the timing, location, and direction of the project. Guidance from instructors or peers with more experience or skills is embedded in the act of designing. Second, projects are shared, discussed, and critiqued among members of the studio, such as through design reviews and pin-ups. Third, all studio work is periodically presented in public forums. (¶ 2)

The Studio was founded on two theoretical principles (Rieber, 2000): (a) a constructivist (or more specifically a Papertian constructionist; Papert, 1980) perspective of learning, and (b) a belief in the potential of situated learning in authentic environments (Brown, Collins, & Duguid, 1989). One of the primary theories behind the Studio was that people learn well while building things. Papert (1980) emphasized objects that can be "shown, discussed, examined, probed, and discussed" (p. 142). Instead of teacher-centered classes, the Studio would be a student-centered environment, where students would work both independently and in groups on real projects, with the professors there as guides and advisors. The belief was that active construction of

projects and products in an authentic environment would help students better integrate their knowledge into the larger context of becoming an instructional designer or developer, and it would better prepare them for what they would experience out in the work world. This high level of integration and hands-on experience would make up for the lack of more traditional, direct instruction by the faculty.

Rieber (n.d.) noted:

> Creating effective educational multimedia requires many people with many skills, talents, and experiences. The abilities needed to complete a successful project are necessarily distributed across the development team. Examples include knowledge of the subject matter, project management, instructional design, evaluation, graphic design, and a wide array of computer tools (authoring/programming, graphics, animation, etc.). No one person can possibly know it all. The increase in web-based forms of instructional materials further complicates this design process, requiring not only another layer of technical sophistication, but often complete rethinking of how instructional materials ought to be designed. At the core of all of this is a creative and collaborative problem-solving process in which members of the team must somehow learn how to work with and rely upon each other.
>
> Unfortunately, graduate programs that prepare people to join these development teams rarely teach this way. Even the most innovative of instructors have difficulty providing their students with authentic and collaborative design

experiences under the constraints of the one-course/one-instructor model."

(¶ 1 & 2)

The Studio was seen as a solution to these problems such as lack of transfer of skills to practice and the artificial isolation of different skill sets. The Studio would pool the resources of the faculty and students in an authentic learning environment, where the boundaries between the many skill sets and knowledge bases in the field could begin to be broken down.

Constructionism in the Design of the Studio

The creation of the Studio at the University of Georgia was heavily influenced by Papert's (1980) theory of constructionism (Orey et al., 2000; Rieber, 2000). Constructionism is a learning theory based on a constructivist epistemology. If the epistemology of constructivism says that we construct our own knowledge, than the learning theory of constructionism uses that theory to say that we best construct our own knowledge by physically constructing an artifact of some sort around which we ground our learning. Constructionism, of course, is not the only learning theory based on a constructivist epistemology. Indeed, most current theories that could be labeled constructivist, for example, goal-based scenarios (Schank, Fano, Bell, & Jona, 1993) and anchored instruction (Cognition and Technology Group at Vanderbilt, 1990), overlap with constructionism in many ways. At its most basic, however, constructionism posits a connection between doing and knowing. This is an idea that can be traced to philosophical ideas on pragmatism developed by Charles Pierce, William James, and James Dewey at the end of the 19th century. Dewey, for example, saw no division between doing and thinking. A common maxim of

pragmatism came from Alexander Bain, who stated that a belief (i.e., something we know) is "that upon which a man is prepared to act" (Menand, 2001, p. 225).

In the late 1960s, Seymour Papert, an MIT mathematician who had become interested in human cognition through work he had done with the epistemologist Jean Piaget, was running one of the earliest classroom experiments using the programming language Logo at the Muzzey Junior High School in Lexington, Massachusetts, when he began to take notice of the art class that he passed every day on his way to the class where he was conducting his research (Papert & Harel, 1991). The students in the art class were carving soap sculptures, and Papert marveled at the differences between this class and the math class he was studying. In the art class, students were given weeks to work on their project, allowing them time to reflect on their work, get inspired by the work of their classmates, and modify their project accordingly. Papert saw how similar this was to the way mathematicians work, and yet how opposite it was to the way math was taught, where the students worked from theorems and solved problem after problem without the benefit of context, reflection, or collaboration. The image of this class stuck with Papert, and for a long time he played around with the idea of "soap-sculpture math." Eventually, he began to apply these ideas to his use of Logo, which lead ultimately to his theory of constructionism. Although much research has been conducted over the years under the umbrella of constructionism and the theory has been applied to multiple subject areas, "soap-sculpture learning" is still a term that resonates with the vision of the constructionist classroom.

Papert's vision of constructionism is, in many ways, an off-shoot from work on constructivism by Jean Piaget, whom Papert worked with early in his career. Although Piaget

may be best known for his stage theory of childhood cognitive development, it is also his "stage-independent" (Rieber, 1996) theory that ties into Papert's thinking on constructionism. Piaget's stages of development in children state that "children not only have their own views of the world (which differ from those of adults), but [that] these views are extremely coherent and robust" (Ackermann, 2001, p. 3). Children are not little adults but view the world in their own way, which changes as they develop and get closer to adulthood. Because of this, whatever an adult (be it teacher, parent) tells to a child gets reinterpreted, according to the child's current stage of development, to fit the child's view of the world. This led Piaget to develop his ideas on constructivism: Knowledge is not something outside of ourselves that simply needs to be transmitted to us in order for us to understand it. Rather, any knowledge we gain must be reinterpreted or constructed by us internally to fit our view of the world and how we make sense of the world.

Piaget's constructivism lent itself to a "stage independent" version of the theory, which connects to the stage-dependent theory but can be viewed by itself. We possess cognitive structures, or schemas, that have been formed through earlier development and that represent what we know. When we encounter new information or objects in the external world, we are put into disequilibrium, a state where we have to deal somehow with the new information and reconcile it with what we already know – our existing schema. There are two ways we do this: (a) through assimilation, in which we reconcile this new information by incorporating it into an already existing schema, or (b) through accommodation, in which we are unable to reconcile it with existing schema, but we are able to create new schema to hold this new information. If

neither of these cognitive tasks occur, the new information is discarded and nothing new is learned (Rieber, 1996).

Papert's ideas on constructionism stem directly from Piaget's, and Papert (1993) himself wrote that "constructionism … [is] my personal reconstruction of constructivism" (pp. 142–143). But because of personal experiences such as soap sculpture math, Papert (1993), perceiving the need for "less of a pure mentalist doctrine" (p. 143), maintained that "One of my central … tenets is that the construction that takes place "in the head" [i.e., Piaget's constructivism] often happens especially felicitously when it is supported by construction of a more public sort 'in the world'" (p. 142).

Papert offered, what he called, a "correction" to Piaget through "a conceptualization of the concrete that is made earthier than Piaget's, by giving objects a central role" (Papert, 1990, p. 7). This thinking leads to two characteristic features of a constructionist learning environment: (a) the "object-to-think-with" (Papert, 1990, p. 7), originally the turtle, the graphical component of the Logo programming language, but since expanded to other microworlds (Rieber, 2004) and construction kits (Perkins, 1991), and (b) the use of this tool to build a shareable artifact that demonstrates the student's learning. These ideas may be Papert's most far-reaching innovations – the idea that working on a computer is "hands on" work, akin to building with blocks or clay; that the virtual world inside the computer is something that can be physically manipulated.

Papert (1993) contrasts his theory of constructionism (and situates it as a learning theory by the comparison) with what he calls instructionism, that is, traditional teaching methods where the teacher teaches and the students sit and listen. Instructionism can also be called the

transmission method of instruction, the sponge method (Schank & Jona, 1991), and the banking method (Freire & Macedo, 1987).

Schank and Jona (1991) outlined three problems with what they call the sponge method: (a) because each student is an individual with a different knowledge base, what they absorb from the teacher and how they relate it to their own knowledge differs, so in effect, every student is learning something different; (b) it makes students think that the information presented is beyond question, because it comes from an authority figure; and (c) it assigns the role of absorber (and later, regurgitator) to the student. Papert has always seen constructionism as a way to correct the instructionist tendencies of schooling.

Although Papert contrasts two learning theories, constructionism with instructionism, it is really the epistemologies behind such practices that are opposed. That is, real comparison should be between the epistemologies of constructivism and objectivism (Jonassen, 1991): The question about whether students are banks to be filled with information or whether they construct their own information decides all the following questions, such as how a class should be taught or how learning should be assessed. Although constructionism is opposed to instructionism, so are all other constructivist-based learning theories. For example, Schank and Jona (1991) list six possible methods of teaching (sponge method, apprenticeship method, artist method, research method, exploration method, and argument method), all of which, except for the sponge method, are constructivist based and could be placed in opposition to instructionism, or the sponge method.

Examples of constructionist environments are abundant in the field of instructional technology: the design of instructional games (Kafai, 1996), learners designing their own instructional software (Harel, 1991), the use of scientific instrumentation (Resnick, 1998), learner's use of expert systems (Jonassen, 1996), the understanding of complex systems (Resnick, 1996), and the use of three-dimensional animal habitat simulations (Hay & Barab, 2001). In today's higher education environment, constructionism may well lend itself to many instructional contexts, including, according to its developers, to the design studio in the instructional design and development program at the University of Georgia.

Communities of Practice

The design studio, in many ways, mirrors the findings of Lave and Wenger's (1991) survey of apprenticeship models, which they used to develop their theories on legitimate peripheral participation and communities of practice. Lave and Wenger (1991) noted that in these situations "learning is an integral and indispensable aspect of social practice" (p. 31) and that "there is very little observable teaching; the more basic phenomenon is learning" (p. 92). For Lave and Wenger (1991), "learning is not merely situated in practice – as if it were some independently reifiable process that just happened to be located somewhere; learning is an integral part of a generative social practice in the lived-in world" (p. 35). The design-studio learning environment attempts to create such a "lived-in" world of working designers. The goal of such a learning environment, according to legitimate peripheral participation, is to move learners from being first-timers to being old-timers, veterans, or experts. The community-of-practice framework evolves the apprenticeship model of learning to large-scale, classroom-based

learning. An apprenticeship model tries "to enculturate students into authentic practices through activity and social interaction in a way similar to that evident – and evidently successful – in craft apprenticeships [e.g., tailors, carpenters, cobblers]" (Brown et al., 1989, p. 37). The design-studio model of learning is a real-world example of the principles put forward by Brown et al. (1989) that apprenticeship models must move out of their historical connotations of being used primarily for skilled labor and of being tightly bound by a sometimes oppressive master-apprentice hierarchy. It was the design studio that moved architecture education from its own apprenticeship period to its current educational model (Koch et al., 2002).

Legitimate peripheral participation describes "learning as social participation" (Wenger, 1998, p. 4), which mirrors the master-apprentice relationship seen in traditional apprenticeship learning. However, legitimate peripheral participation posits that it is not this master-apprentice relationship that is most important, that "a specific master-apprentice relation is not … ubiquitously characteristic of apprenticeship learning" (Lave & Wenger, 1991, p. 91). What is most important is the legitimacy of belonging in the community of participants that is conferred on the participants, "decentering common notions of mastery and pedagogy" (p. 94); that this conferring of legitimacy is "more important than the issue of providing teaching" (p. 92).

This expands the relationship of apprentices to other apprentices and other masters, in other words, to the whole community:

> In apprenticeship, opportunities for learning are, more often than not, given structure by work practices instead of by strongly asymmetrical master-apprentice relations. Under these circumstances, learners may have a space of 'benign

> community neglect' in which to configure their own learning relations with other apprentices. There may be a looser coupling between relations among learners on the one hand and the often hierarchical relations between learners and old-timers on the other hand, than where directive pedagogy is the central motive of institutional organization. It seems typical of apprenticeship that apprentices learn mostly in relation with other apprentices. There is anecdotal (Butler personal communication; Hass n.d.) that where the circulation of knowledge among peers and near-peers is possible, it spreads exceedingly rapidly and effectively. (Lave & Wenger, 1991, p. 93)

It is important to remember that a community of practice is not simply any group or organization, it is not merely a network of interpersonal relationships, and it is not formed just through geographical proximity of persons to one another (Wenger, 1998, p. 74). Wenger (1998) outlined the characteristics of a community of practice as an interplay between (a) mutual engagement, (b) joint enterprise, and (c) shared repertoire.

According to Wenger (1998), "The first characteristic of practice as the source of coherence of a community is the mutual engagement of participants" (p. 73). Mutual engagement means that "Practice does not exist in the abstract. It exists because people are engaged in actions whose meanings they negotiate with one another" (p. 73). The negotiation that a community practices through mutual engagement must come together in a joint enterprise; that is, the community must be focused on a common goal or goals to be considered a community of practice. Finally, through the endeavor of the joint enterprise, a community of

practice "creates resources for negotiating meaning" (Wenger, 1998, p. 82). This repertoire "includes routines, words, tools, ways of doing things, stories, gestures, symbols, genres, actions, or concepts that the community has produced or adopted in the course of its existence" (Wenger, 1998, p. 83).

Identity in Practice

If the conferring of legitimacy on learners is the most important aspect of a community of practice, then it follows that becoming a full member of the community and identifying as a member of the community must also be important. As an outgrowth from his theories on community and practice, Wenger (1998) formulated a framework of identity within his larger framework of communities of practice. He saw identity as "a way of talking about how learning changes who we are and creates histories of becoming in the context of our communities" (p. 5), and he broke down identity into several characteristics: (a) identity as negotiated experience, (b) identity as community membership, (c) identity as learning trajectory, (d) identity as nexus of membership, and (e) identity as relation between the local and the global (p. 149).

Wenger's (1998) take on identity differed from other sociocultural theories of identity in that it is "not equivalent to a self-image" (p. 151). In other words, self-identification is not the primary means of identity creation. "These words are important," he added, "but they are not the full, lived experience of engagement in practice" (p. 151). For Wenger, it is what we do, the practice in which we engage, rather than who we say we are that is important. It is these practices, these actions, which come to form the self-image we have of ourselves, the words we use to

describe ourselves: "What narratives, categories, roles, and positions come to mean as an experience of participation is something that must be worked out in practice" (p. 151).

Wenger (1998) saw identity as a process that combined this participation in the community with a reflexive process of reification "by which our experiences and its social interpretation" (p. 151) informs participation. "It is this … interplay of participation and reification that our experience of life becomes one of identity" (p. 151).

An example of this identity formation within a community can be seen in Haneda (2005). In this study, two students learning Japanese in Canada both had success learning the language by identifying themselves as part of the larger community of practice of Japanese speakers. However, they both came at this from different perspectives. One student identified himself with the community of academics learning Japanese. The other identified himself with business people who were speaking Japanese. Both students were successful, even though the community they fit themselves into differed.

Evard (1996), who framed her work with fifth graders designing educational video games as a community of designers, finding that a community of peers developed even at this age once the proper environment was set up (in this case, using a local network news server, NewsMaker, for communication among the students). These fifth graders began to ask, and more importantly, answer difficult questions of each others while they were designing their games.

Recker, Olson, Rogers, and duPlessis (2000) examined the IT graduate program at Utah State through a "thinking practices" framework. This lens combined community of practice (Lave & Wenger, 1991) with Collins' (1998) division between a conserving community and a

learning community and Perkins' (1992) classification of tools and artifacts in a community of practice. They used brainstorming sessions and interviews to examine "how participants … perceive their past, present, and future roles within the field of instructional technology as they participated in various communities of practice" (Recker et al., 2000, p. 15). The results from this study were problematic because the results from a brainstorming session did not match the results of interviews conducted with two students. The brainstorming-session data revealed, to the researchers, that "inbound participants" (i.e., students who identified themselves as new to the community) would be unsure of their place and skills and view the department as a "conserving" community of practice, whereas students who were "insider participants" would feel more comfortable in their position and skills and view the department as a "learning" community of practice. The interview data suggested, to the researchers, just the opposite, however; that the insiders perceived the community as a "conserving" one. It should be noted that the limited interview data as well as problematic inferences made by the researchers about the brainstorming-session data make this study of limited use. However, the researchers' connection between learner trajectory and the view of the community presents one possible way of looking at a design-studio environment.

Chapter Summary

This chapter reviewed the extant literature in design, the design studio model, and communities of practice that led to the conducting of this research. Design is an ambiguous term that is difficult to define because it is used in so many disciplines. However, the core idea of design – the systematic process of creating purposeful artifacts – falls well within the parameters

the field of instructional technologies outlines for instructional design. How designers design, however, is an area that has received little attention in the field. The existing research has, however, led to the implementation of a design-studio model for the teaching of instructional design and development, as seen in the University of Georgia's master's program. The use of such a model for the education of designers has a long history in architecture and a more recent history in some fields that have not traditionally used the design-studio model. However, in all these fields, and even within architecture education, where the design studio has been the primary means of education for over 100 years, little to no research has been done to determine how the students are conducting design. This study attempted to do just that through the use of a community-of-practice framework; and the last part of this literature review covered communities of practice and their limited use in the field of instructional-technology education. By examining design, the design studio, communities of practice, and identity within a community of practice, this chapter lays the groundwork for this study, which is expanded on in the analysis and interpretation chapter. The next chapter discusses the methodology followed in this study.

CHAPTER THREE

METHODOLOGY

The purpose of this study was to examine the culture of student designers that exists in the Studio. More specifically, it examined the culture that existed in the Studio during the fall semester of 2004 as seen through the lens of the Sonic Design[1] team as they worked on their final group project for their master's degree.

This study was framed by a belief that students' knowledge of design and the design process as well as their formation of identity as designers is socially constructed within both the context of their design team and the context of the larger Studio culture. Specifically, the study was designed to answer the following research questions:

1. How do theories of communities of practice explicate the way students engage in and negotiate design of an authentic design project within a team-based context?
2. How is the way in which students conduct design within a team-based context influenced by the design-studio model?
3. How do students come to identity themselves as members of the culture of designers in the design team, in the Studio, and in the larger cultures of instructional and multimedia designers? Where and how is value assigned within this culture?

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[1] The "Sonic Design" team name, and all the participants' names in this study are pseudonyms.

Table 1 shows a data-collection planning matrix that aligns research questions to data-collection methods.

This study was ethnographic in nature. However, what is and what is not ethnography is an issue that is often addressed in the literature, especially when conducting newer forms of the ethnographic method such as those used in our own cultures and in educational settings. Although Wolcott (1980), in particular, differentiated between "real" ethnographies and other, simply descriptive studies passing themselves off as ethnographies, other leading researchers have a different view. LeCompte and Preissle (1993) listed the characteristics of classic ethnography as (a) investigation of a small, homogenous site; (b) long-term observation of the site; (c) the use of participant observation; (d) the creation of field notes as the primary data source; and (e) interpretative description and explanation of the culture of the site. One can find exceptions to most of these rules, however (see, for example, Fetterman, 1989, and Marcus, 1998, and even other sections of LeCompte and Preissle, 1993), and the single agreed upon point seems to be that an ethnography must have a focus on culture. In the field of education, LeCompte and Preissle (1993) looked at different types of school-based ethnographies, and their description of "microethnographies of small work and leisure groups within classrooms or schools" (p. 14) seems to be the best description of this study. If qualitative research is best at answering "how" questions, and ethnography as a subset of qualitative research is best at answering questions related to (a) uncovering the characteristics of a population, (b) describing how individuals in a group define and interpret their world, (c) documenting a process, (d) presenting what people do

Table 1
Data Collection Planning Matrix

Research Question	*Primary Data Collection Method*	*Source*
How do theories of communities of practice explicate the way students engage in and negotiate design of an authentic design project within a team-based context?	Participant-observation Semi-structured interviews Focus-group interviews Archival material	Design team meetings Individual team members EDIT 6200 and 6210 students Design team artifacts
How is the way in which students conduct design within a team-based context influenced by the design-studio model?	Participant-observation Semi-structured interviews	Design team meetings Individual team member
How do students come to identity themselves as members of the culture of designers in the design team, in the Studio, and in the larger cultures of instructional and multimedia designers? Where and how is value assigned within this culture?	Participant observation Semi-structured interviews Focus-group interviews Archival material	Design team meetings Individual team members EDIT 6200 and 6210 students Individual team members

and say, and (e) finding out what is going on (LeCompte & Schensul, 1999), then this study falls solidly within the ethnographic arena.

Description of the Research Setting

From the very beginning, the purpose of this research was to focus on how design was being done in the design studio courses in the Instructional Technology program at the University of Georgia. For that reason, the selection of the site was easy. Selection of the specific participants within the Studio was more difficult, however, and that is discussed in the section "Research Participants and Gaining Access." This section provides a general review of the class in which the study took place. In this chapter, I discuss the actual classroom environment of the Studio. For background and research on the Studio, see the literature review in Chapter 2.

The Studio is as unique a site for ethnographic study as it is a site for learning, in that there is less a notion of both physical and temporal space than in a traditional classroom. You will not find "Studio" in any course schedule; rather it is an umbrella term covering three distinct courses, EDIT 6190, EDIT 6200, and EDIT 6210 (Appendix B contains the entire Studio Handbook from the semester of my data collection). According to the official class schedule, the three classes that make up the Studio all meet in the same location (the computer lab in 616 Aderhold Hall) at the same time (Thursday nights from 5:00PM to 7:45PM). However, as will be seen, the location and the time vary, and, to some extent, the course divisions are porous.

Thursday nights on the 6th floor of Aderhold Hall are a bustle of activity. Students in EDIT 6190, 6200, and 6210 all meet during this night, but only occasionally do students meet in course-specific groupings. To an outsider, it might appear as if the students were all in one big

class; although it is just as likely that the visitor would think there were six classes going on, or perhaps no class at all – just a bunch of students working in a computer lab. Students often meet in small groups in any of a number of classrooms on the floor (Figure 1 shows a floor plan of the rooms commonly used by the Studio). The computer lab in 616 often has the bulk of the students, independently working on projects or consulting with other students or instructors about their projects. At other times, however, the 616 lab would be almost empty, with most of the students taking part in a voluntary breakout special-interest group (SIG) on a topic of interest to the students or to one of the instructors (an example of such a SIG is the one on graphic design that I have conducted over the past few years). In the 613 classroom, the 626 classroom, or the 603 conference room, students in the final Studio class (EDIT 6210) could be meeting in their design teams discussing their group projects. It is sometimes possible that, other than for the design-team meetings, students in the class may not even be physically present in Aderhold Hall; rather, they may be connecting online from their homes or elsewhere to a software tutorial or other instructor-led session in a virtual classroom.

The class meeting time, as well, has a flexibility not seen in traditional college classes. The class begins at 5:00PM, but students are often in the 616 lab or working on their wireless-enabled laptops in any number of locations by 3:00PM or 4:00PM. Although the official ending time is 7:45PM and no one is required to stay beyond it, students may still be attending design-team meetings at 9:00PM or latter, or students may leave early to work at home or elsewhere on campus.

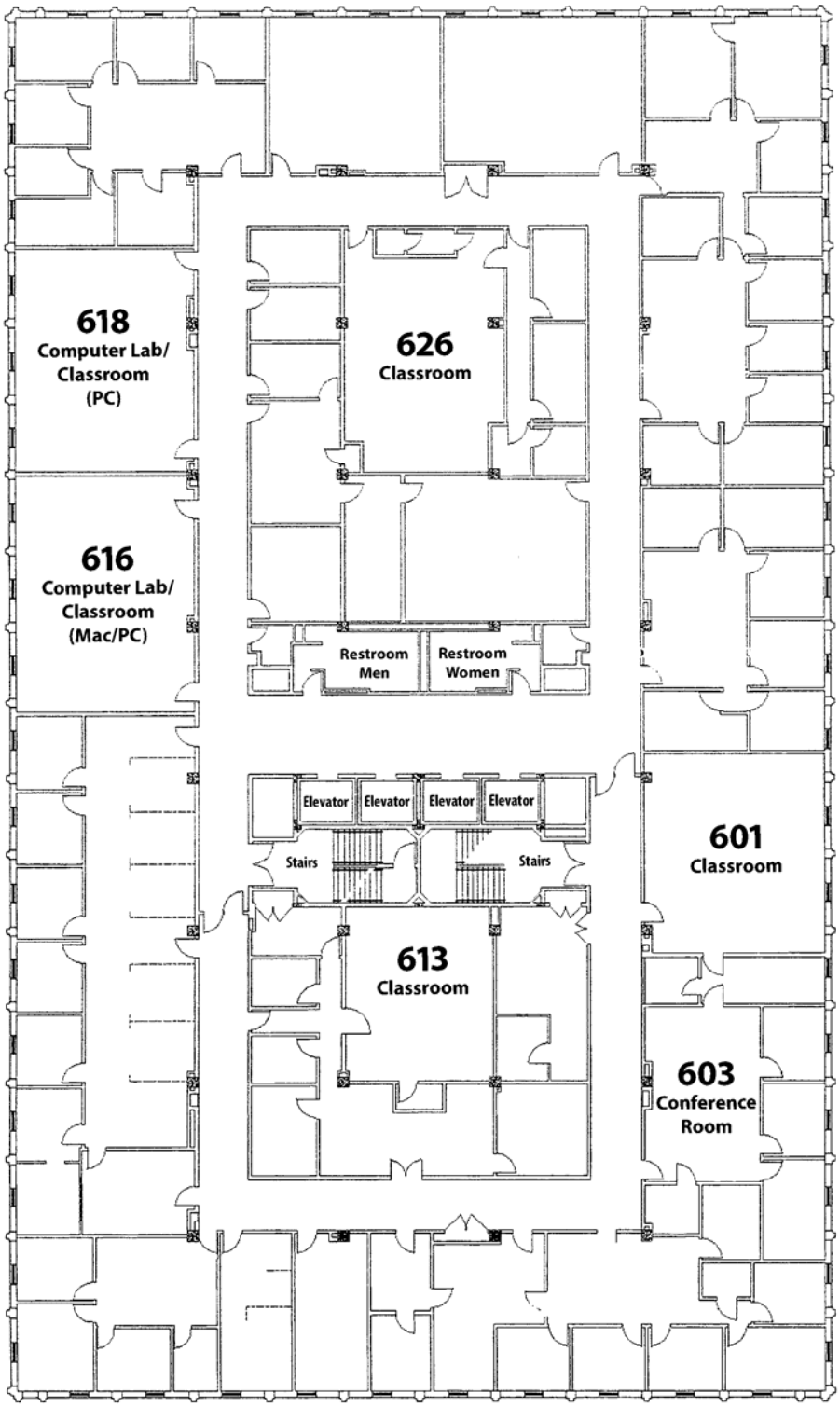

Figure 1. Aderhold Sixth-Floor Plan Showing Studio Classrooms

Despite the open nature of the typical Studio session, the class is well organized, as evident by the 48-page course syllabus, which is actually referred to as a "handbook" (Rieber et al., 2004). Students do not move through the Studio or the master's program as a defined cohort, but loose cohorts of students do develop as students move through the program, and students are given labels based on their progress. "First timer" students begin the Studio in EDIT 6190. This initial course in the Studio sequence is labeled the "constructionist" course, because the instructors view it as a hands-on introduction to Papertian constructionist learning, but is often called the "tools" class by the students, because it is in this class that students learn a set of software tools that they will take with them into later courses in the Studio. "First timers" complete a self-selected project using these tools. Although the choice of software tools is left to the student, most of them select from a set of common tools including Macromedia Dreamweaver, Fireworks, and Flash; Adobe Photoshop; and Macromedia Authorware and Director.

Students may elect to take EDIT 6190 for a second time (and are often called "6190 second timers" to differentiate them) to expand their toolset and complete another self-selected project. For this second set of software tools, students sometimes expand their multimedia toolset, but often they learn more advanced topics, such as Active Server Pages (ASP) or PHP/MySQL dynamic database development, which almost approach computer programming. Originally, and still in effect when I was a student in the Studio, the second 6190 was required, but over time the faculty have loosened this requirement so students could enroll in other

courses that enable students to develop knowledge and skills relevant to the Studio, such as video production or project management.

The next class students take in the Studio is EDIT 6200, which is their first chance to create an interactive, multimedia learning module. Because this is the first course in the Studio that requires students to complete a project specifically for learning, the instructional-design course, EDIT 6170 (which is not considered a part of the Studio sequence), is a prerequisite for EDIT 6200. For EDIT 6200, each student secures an external client and contracts with the client to create an instructional product. This work is done individually by each student using the tools learned in EDIT 6190 and other skills learned in more traditional courses taken in the master's program such as instructional design.

For the last required Studio course, EDIT 6210, students form three- to five-person design teams and contract with an external client to produce a much more extensive interactive multimedia educational product than they did as individual students in EDIT 6200. The students create an instructional unit as opposed to a single lesson. Students must also pass an oral comprehensive examination in EDIT 6210 as part of the overall master's degree requirements. A final portfolio defense of all work completed both in the Studio and in other non-Studio courses is a final requirement of the master's degree, but it is completed outside of any specific course.

This final course, EDIT 6210, the one from which participants for this study were chosen, is the studio class where students are given the most freedom to work independently of the faculty. The teams are student created (with nominal approval of the instructors), and the students locate and secure their own client. The team is required to create a complete project that

involves both the designing of instruction, the specification of the media, and the development of all media and resources. The majority of the students' time is spent working on this project, but other requirements for the course include providing desk crits, a version of the design critique, of other students' work, taking part in special-interest groups (SIGs), providing 10 hours of service to the Studio or local community, and preparing for the final oral comprehensive examinations at the end of the semester.

All of the Studio courses are non-traditional classes in that the instructors have created a learning environment that adheres to constructivist and constructionist theories of learning (Papert, 1980). There is little direct instruction in the Studio, and the majority of class time is spent by students working on projects with the instructors playing the "guide on the side" role that is common in a constructivist classroom. EDIT 6210 is the most non-traditional of the courses, and the students are responsible not only for the work they must do, but are largely responsible for how they go about doing it. The amount of instructor intervention with an EDIT 6210 team usually depends on how well the team is working on their own. Highly competent teams, such as the one in this study, are given a high level of autonomy, and the instructor for this sort of team often just makes sure the team meets all their deadlines. In other cases, where the team needs more help, the instructor for EDIT 6210 will be more involved with the week-to-week work of the team. Lave and Wenger (1991) label this giving of autonomy to apprentices or students as "benign community neglect" (p. 93) to indicate that this "neglect" by the instructors, this granting of autonomy, is a planned step in letting the students create their own path to becoming full members of the community of practitioners.

Every semester of the Studio culminates in the Studio Showcase, which occurs during the last class of the semester and is the final showing of all the work the students have done over the semester. All students, regardless of course level, take part in the Studio Showcase, and their work is presented on computers in the Aderhold 616 and 618 computer labs. Students in EDIT 6190 and EDIT 6200, who have completed individual projects, present their work at once on all the computers in the labs in sort of an electronic poster session. Studio students and outside visitors wander around, stopping at projects that they find interesting. Visitors both observe projects and actively test them out by sitting down and using them. The EDIT 6210 teams also display their project during this "poster" session, but they also give a short 5- to 10-minute presentation of the project at the very beginning of the Studio Showcase class session. The Showcase is a big event for both the students and the instructors, and to prepare for it, they hold an additional, student-only "dress rehearsal" of the Studio Showcase at least 2 weeks before the actual event (although because of scheduling during the semester I collected data, the dress rehearsal was held 3 weeks before the final class).

Pilot Study

In the fall of 2003, I conducted a study within the context of the Studio, interviewing three students who were in the program at the time, including Sarah, who became the project manager of the design team in the study reported in this dissertation. The purpose of this exploratory study was to look at student perceptions of their experiences learning and doing design in the Studio, including how their background, the curriculum of the Studio, and the community of learners in the Studio had influenced and shaped their thoughts on design. This

study indicated that, despite the varied backgrounds of the participants, the studio model fit all of them as students. It also showed that the community of the Studio was not as strong as I has experienced (or remembered) from my days in the Studio, and that there was a bit of a disconnect between the students' and instructors' perceived notions of what should be done in the class, the students generally feeling that there were too many non-project requirements, which got in the way of working on their projects.

The most important finding in this exploratory study, however, was the limitation in my research methods. I was attempting to understand the way the participants thought about design by interviewing them and asking them questions about design. However, this was an unsuccessful strategy, and it made me realize that any follow up study (i.e., this dissertation) would have to use a different method of uncovering the answers to my research questions. In the conclusion to this earlier study, I came to the realization that many people simply lack the language to discuss such "meta" questions as those I was asking about design, and that the only way to pursue this research path was to observe people doing and living design.

Research Participants and Gaining Access

Because of the decentralized nature of the Studio, and the myriad of possibilities when it came to conducting research in such a complex environment, it was necessary to limit the specific data-collection site and participants. Based on my research questions and the theoretical framework inherent in them, I utilized informal judgmental sampling (Fetterman, 1989) – in that I used my own judgment to select what I saw as the best site and participants to answer my research questions – to select a design team in the last course of the Studio sequence, EDIT 6210.

This supplied me with a central "site" and central participants within the Studio on which I based my observations: the design-team meetings and the members of an EDIT 6210 design team.

There were two EDIT 6210 teams in the fall of 2004, and because participation by one of these teams was essential to the completion of this research, it was necessary for me to choose one and secure their participation before any additional work was completed on this research study. Gaining entry to one of these design teams was possible because I taught a special-interest group (SIG) on graphic design in the spring of 2004, the semester before my study took place, and so I got to know some of the current students, including, as it turned out, most of the members of one of the upcoming fall EDIT 6210 design teams. Of the two teams, one was going to be led by Sarah, whom I had interviewed for my pilot study in the fall of 2003 and who was also one of my fellow EDIT 2000 teaching assistants from the 2003–2004 academic year. So it was Sarah's team that I chose to study.

Because of my earlier interview with Sarah, I was, at least, partially aware of some of her thoughts on the subject of design and the Studio itself, and I was confident that her team would be a good group with which to conduct this study. I believed that the team had enough design ability to make their thoughts on design evident in their group discussions. This was an important consideration, because if I had observed a group that did not have it "together" enough to carry on informed conversations, I would not have collected much in the way of data, and the study would become something other than what I intended.

Although I based this study on a single design team, I was also able to get a view of the larger Studio population. This was because students in the earlier classes are required to take part

to varying degrees in the design team's work throughout the semester. Students in EDIT 6190 are required to attend two design meetings, and students in EDIT 6200 are required to act as outside consultants or subcontractors for one of the design teams. The EDIT 6190 students do not take an active role in the design team; rather, they observe what is happening in the meetings to get an idea of what is coming up in future courses, and they therefore played a small part in my study. The EDIT 6200 members, however, come to more meetings, and they take on a low-level of responsibility for a specific part of the project (be it a bit of graphic design, some programming, search for resources, etc.). Therefore, the EDIT 6200 consultants served as a window for me to look outside the design team at the larger Studio.

All in all, this research "site" worked well, because I was able both to focus on a central design team (a small slice of the total Studio picture) and, because of the other students who had to become involved with the design team, get a picture of the broader course.

Description of Participants

For EDIT 6210, students are expected to organize themselves into design teams (with some limited intervention from the instructors) and create a pseudo company under which they will work. The participants in this study, Sarah, Tamieka, and Jing, organized themselves into the Sonic Design team.

Sarah

I originally approached Sarah, a woman in her mid-20s, in the spring of 2004 about her possible participation in my upcoming dissertation study. Sarah was a graduate teaching assistant, teaching EDIT 2000 in the Instructional Technology Department, as was I that

semester. Our offices were next door to each other, and we had a friendly working relationship, often talking about our coursework in our respective programs. I was well aware of the work Sarah had been doing in the Studio during the time we worked together.

Sarah had started the master's program in the fall of 2002, and she was one of the relatively rare (for this department) full-time master's students. She also came in with extensive experience as a computer-software trainer, and so was given a position as a teaching assistant in EDIT 2000, an undergraduate course that the department offered primarily for students enrolled in various teacher preparation programs in the College of Education. EDIT 2000 teaching positions were usually reserved for doctoral students, and Sarah was the only master's student to be given the position during my time in the department. Sarah and I both started teaching EDIT 2000 in the fall of 2002. Sarah was new to the department, and I had recently moved to a teaching assistantship from a graduate research assistant position to gain needed teaching experience.

Sarah had come from to the university after 2 years of working at New Horizons Computer Learning Center in Reno, Nevada. New Horizons Computer Learning Center is a chain of technical and computer training centers with 280 locations nationwide, according to Sarah. While there, she taught everything from Dreamweaver and Illustrator to Quickbooks and Excel in a very structured, preset teaching environment. As she put it, "I've taught QuickBooks, but I'm not an accountant. And I've taught Illustrator at all levels to graphic artists, and I've

taught Photoshop [but she was not a graphic artist]" (Interview, 01-Dec-03[2]). It was this teaching experience that led her to the M.Ed. program at UGA:

> "I felt like when I teaching in Reno that I knew how to … teach … to the level of the … you know, if there was somebody in my class and they didn't understand something, I could bring it down a level and actually communicate and, like, teach them about it without making them … overloading them, per se. So, anyway, I liked the teaching aspect, and I wanted to find a degree where I could do the technical computer science stuff but not all technical, and I wanted to be able to do sort of the design and the other stuff that I had taught in Reno" (Interview, 01-Dec-03).

The program at UGA looked like a good choice, because she did not "have an educational background [as an undergraduate], so I didn't want to go […] into programs [that emphasized "education" technology rather than "instructional" technology]." She also did not "really want to do, necessarily, business and industry either, but it was a good mix." (Interview, 01-Dec-03).

As Sarah stated, her background was not in education, not an uncommon occurrence in the field (e.g., my undergraduate degree is in English Composition and two members of the IT faculty have undergraduate degrees in music; such diverse backgrounds also seem to be common in other IT departments). Her undergraduate degree was in computer science, having received

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[2] With Sarah's permission, I used the interview I conducted with her from my pilot study, so I didn't have to ask her the same questions again for this study.

her degree from Embry Riddle Aeronautical University in Florida, where her father was on the faculty and where she was able to go for free. Sarah graduated with her Masters the semester after this data were collected. She is currently teaching a community college in Montana.

Tamieka

Tamieka's reputation as an artist and graphic designer was well-known by both me and the Studio at large before the semester began. Although her educational background was in psychology, her interest in cartooning, photography, and graphic design has long been a part of her life.

Tamieka was an African-American woman in her mid-20s from Atlanta, Georgia. Her family was very important to her, and she spent many weekends as well as weekday nights in Atlanta visiting with family members. This commitment to family manifested itself in the project when she recruited her niece and nephew to voice two of the characters for their project.

She was an extremely friendly and happy individual who laughed easily, and whose personality and humor kept the atmosphere of the team light even when things got stressful. Over the course of this study, and even afterwards when she was my co-worker on campus in the Office of Instructional Support and Development (OISD), I honestly cannot think of a time when she was in a bad mood or a time where she had a bad word to say about anyone.

During the time she was in this class, she worked as a graduate assistant in the OISD as a graphic designer and project manager. Her agreement at the time was that she would start a full-time position with the OISD once she graduated, which she did after the semester the data were collected. She is currently working as an instructional designer for Home Depot in Atlanta.

Jing

Jing was an international student from mainland China. She had been in this country and at the University of Georgia for 2 years, and was one semester away from graduating when she volunteered to take part in this study. Jing was the oldest member of the team in her mid-30s and she was married with an 8-year-old son, who often accompanied her to team meetings and classes, where he would sit at a computer in the back of the room and surf the Internet while his mother took part in the design team. Jing lived in family housing at the university, where many of the international students attending the university lived. Her English language skills were on par for someone who had learned it in school and had been in this country only 2 years. There were some moments where it was difficult for me to understand her, but these moments became less frequent as the semester progressed, and I became more accustomed to her pronunciation. Her English was surely much better than her constant apologies would have indicated, as Jing was very self-conscious of her spoken English.

Jing had graduated with her associate's degree in computer science from the University of Science and Technology in Beijing in 1990, and then after a 2-year break, she continued for her bachelor's degree in computer science, graduating in 1995. After graduation, she worked in various positions at one of China's largest Internet service providers. She provided customer and technical support for the web-design and customer-training department for part of her time at the company, and also programmed in the FoxPro database for 2 of those years. It was during her years with the Internet provider that she was exposed to web design and development using HTML and Macromedia Flash. After coming to UGA to join her husband in 2001, who was

already at the university pursuing his doctorate in animal science, she entered the M.Ed. in Instructional Design and Development in 2003. Jing currently works for the OISD at the university.

Consultants

A requirement of the EDIT 6210 course is for the 6210 team to "hire" students from the class that immediately proceeds 6210, EDIT 6200, to act as consultants or subcontractors for the team. The 6200 students who were chosen were Amber, Dan, Ted, and Peter. Amber, Dan, and Ted were master's students in instructional technology, but they all brought different skills to the team. Amber was a good friend of Sarah, and she focused more on instructional design tasks than technology. Dan was one of the better Flash developers in the class, and his graphic design skills were quite good. Ted was a former teacher, who was now working for United Parcel Service, but who was looking to get back into schools as a technology coordinator. Peter was an adult education doctoral student who was electing to take course in instructional technology. He had been in enough EDIT classes that, at first, I thought he was a full-time student in instructional technology. The consultants took part in most of the in-class team meetings, but they only attended a few out-of-class meetings. Their roles in the project were as legitimate peripheral participants in the design team. They were given small tasks of limited size to help the team on their project. They also took part in brain-storming sessions, where ideas for the project were generated. Peter didn't take any Studio courses after EDIT 6200, but the other three continued on and ran their own EDIT 6210 teams in the year following this data collection. They have all since graduated from the program.

Data Collection

Data-Collection Time Frame

Ethnographic studies are traditionally a long-term endeavor, usually seen as a period stretching from 6 months to a year or even more. However, the time period for this study was considerably shorter because of the temporary nature of the design team that was studied. The EDIT 6210 design team began and ended their work in a single semester, the fall of 2004, and so all the data for this study had to be collected in the 16 weeks of the standard university semester. A shorter time frame for an ethnographic study is not unheard of, however, and Fetterman (1989) has noted that "Although Malinowski's position that long-term continuous work in the field is essential applies to foreign cultures, it may be an overstatement for work conducted in one's own culture" (p. 19). This statement would surely apply to my study of the Studio, a program from which I have graduated, and one in which I have kept in contact (through occasional teaching) since graduating from the master's program. It could be argued that I have been "studying" the Studio for over my entire time as a graduate student in the department.

During the fall of 2004, I conducted observations during most of the 3-hour Thursday night Studio classes and also during the majority of the out-of-class meetings held by the design team. Although an EDIT 6210 team is only required to meet for an hour during each class period, most teams meet for almost the entire evening of each class period and during other times outside of class. This team was no exception, and although they kept their class meetings shorter than I had witnessed in the past, they met extensively outside of class, during free time they had during weekdays, at night during the week, and on many weekends. (Appendix A shows

a list of all the in-class and out-of-class meeting times in which I collected data.) I had planned on observing the team any time they met as a team, and I was mostly successful in this, missing only a few meetings because of conflicts with my own schedule. Fetterman (1989) has stressed that the "most important element of fieldwork is being there" (p. 19), and I was surely there for the vast majority of the time that this small community of designers existed.

Participant Observation

Participant observation is traditionally the primary method of data collection for an ethnography, and much of my time was spent "in the field" as a participant observer in the design-team meetings. According to Fetterman (1989), "Participant observation combines participation in the lives of the people under study with maintenance of a professional distance that allows adequate observation and recording of data" (p. 45). Participant observation was necessary for me to understand the design-team culture as it was envisioned and acted upon by the Studio students I was observing.

As with any field research, a quick and accurate means of recording information was needed, and I took condensed field notes that I expanded after a data-collection session (sometimes immediately after a session; other times, after a longer period of time, depending on my schedule). Because I was observing in a meeting environment, where many of the participants were sitting at desks in front of a laptop or desktop computer, I initially planned to use my laptop computer to record my condensed field notes using the note-taking feature in Microsoft Word 2004 for Mac. I tried this initially, including trying to use a Wacom tablet to take quick sketches of whiteboards, but after a few sessions, I realized that this was too awkward. First, it limited my

movement in meetings where the participants moved around far more than I had imagined; and second, it put too much of a barrier between me as the researcher and the study participants. Therefore, I switched to a more traditional notebook, and wrote my field notes by hand. I chose a 6x9 spiral notebook as it was small enough to carry around, yet big enough to actually write on. Additionally, there were a few sessions, most notably the Showcase dress rehearsal and the Showcase itself, where I took notes in a pocket notebook, because I was walking around for those entire sessions, and I needed something unobtrusive and portable.

To compliment my field notes, I also recorded data entries in a research journal when I felt something needed to be noted, as recommended by Spradley (1980). This research journal included personal notes, reactions to the data collection, and thoughts related to the preliminary analysis that would not be appropriate to insert directly into the field notes. In some cases, I made these types of notations directly in my field notes, marking the passage so I would later know it was text outside the field notes proper.

Interviews

In the pilot study, I found interview to be an unsatisfactory method at uncovering participants' ideas on design, but I still believed that interviews combined with the field observations would prove useful, so interviews were conducted, both to get at participants' underlying meaning that was observed during participant observation and to fill in background information that would not be available through any other means. Three types of interviewing were used in this study: (a) informal interviews, (b) formal semi-structured interviews, and (c) focus-group interviews.

Informal Interviews

Informal interviews were conducted with the design-team members during participant-observation sessions as needed to clarify observations. I also interviewed peripheral members of the team (EDIT 6200 students) as the need arose or the opportunity presented itself. Additionally, I conducted short, informal interviews with course instructors if they were present during the team meetings and a specific question presented itself. Instructors were only interviewed if they somehow impacted the design team or the way the design was being done by the team. These interviews were especially important when it appeared that the instructor had somehow affected the design process.

The informal interviews were either ethnographic in intent, in that the questions tried to make sense of the participants' cultural understanding (Spradley, 1980), or they were conducted to clarify some other confusing matter that occurred during a participant-observation session. The responses to these questions were incorporated into the written field notes.

Semi-Structured Interviews

Semi-structured interviews were conducted with the team members at the beginning and at the middle of the semester. I had also planned on conducting an individual exit interview with the three members of the Sonic Design team, but after a semester of data collection, which included many informal individual discussions with the members of the team, and a final group interview with the three-member team, I no longer felt the individual interview was necessary. The two interviews had different foci. The first was a retrospective interview (Fetterman, 1989), focusing on the background of the participants, including life-history information before coming

to the IT program and while in the IT program but before taking this class. I asked them to go over previous design work they had completed for the Studio, and I received permission to look at and include these projects as data. The second interview, at the middle of the semester, focused on the substance of their work in the class to that point – their thoughts as they were in the middle of their design project (and in the middle of my research project). Table 2 contains the protocol for these interviews.

Focus-Group Interviews

A group interview was conducted with the Sonic Design team at the end of the semester. Additionally, a group interview was conducted with the 6200 consultants after the semester ended to get their impressions of the work that was done by the design team, as well as their thoughts on both design and their experiences in the Studio. I especially wanted to get their thoughts on what they felt was valued in the Studio culture and what they were looking for in others' designs. Table 2 contains the interview protocol for the group interviews.

Archival/Artifact Collection

Additional data were collected in the form of physical documents and other artifacts that were generated by the design team throughout the semester. These included:

- Emails between group members (I was included on all emails sent by the team, and received all emails that the team received).
- Web captures of the design team's web site as the semester progressed to chart the team's project through the public information they presented. I used a freeware

Table 2
Interview Protocols

Background Interviews
(These interview took place at the beginning of the semester to gather background knowledge and perceptions before the work began.)

What is your educational and professional background?
What brought you to the M.Ed. program in Instructional Design and Development?
Describe the Studio for me? What's it like to be in it?
Describe your projects that you completed for 6190 (both times it was taken) and 6200. (Projects will be collected if possible.)
How do you feel overall about the success or failure of these projects?
Describe how you came together with this group to form your 6210 team?
Describe to me how you would define design? What sort of design have you done or do you do?

Substance Interviews
(These interviews took place around the mid-point of the semester to get the participants' thoughts on the design process, the class, and the research while they were in the middle of it.)

How do you feel about the state of the project as of today?
Describe the work that you've been doing on this project.
Describe how you've been working with your team mates.
Walk me through how you've designed [the last thing you've worked on for this project]?
Describe any concerns or questions you have about the research that I am conducting in the class?

Follow-up Focus-Group Interview with EDIT 6210 Team
(This interview took place after the end of the semester to get the participants' final thoughts on the project, the class, and the research once they were finished with everything.)

How do you feel about the finished project?
Describe the work that you did on this project.
Describe your experiences working with your team mates.
Describe to me how you would define design?
Walk me through how your team designed this project from start to finish.
Describe any concerns or questions you have about the research that I conducted in the class?

Focus-Group Interview with EDIT 6200 Consultants
(This interview took place after the end of the semester, to get the consultants' final thoughts on the project and the class.)

How do you feel about your own projects for Studio this semester?
How do you feel about the finished project EDIT 6210 project?
Describe the work that you did on the EDIT 6210 project.
Describe your experiences working with the EDIT 6210 team.
Describe to me how you would define design?
Looking at the projects in the Studio, what makes a good design and a bad design for a project?
What are you looking for when you form your own team?

application called SiteSucker to archive the weekly snapshots on my laptop. This was done at six points during the semester.

- A collection of all drafts of the multimedia product. These were primarily in electronic form, and the few that were not, were scanned into my computer and converted to electronic form.
- A collection of all instructional design and development documents, including task and learner analyses, formative and summative evaluations, and any other documents pertaining to the instructional design and development of the project.
- A collection of all the documents created for the design team by the EDIT 6200 consultants/subcontractors.
- The work that I collected from each of the design-team members during my initial retrospective interview (usually in the form of a web address pointing me to their portfolio). The work showed what they have completed in the Studio up to this point (and any pre-Studio work, if applicable).

Data Management

Because of the large amount of data I collected, keeping everything on my computer in digital format was a high priority. The management and organization of this study was carried out entirely on my laptop, and all collected data were stored on my computer. Backups of these materials were kept on two external hard drives and on a remote FTP server. Material that originally existed as hard copy was scanned and saved as PDF images on my computer, and the hard copy was filed away in my office.

Data Analysis

The analysis of the collected data for this study began with an acknowledgement of Wolcott's (1994) divisions between the different stages of working with qualitative data: description, analysis, and interpretation. Wolcott (1994) saw this process as a transformation of the lived experience of the participants and the researcher into the final writing of qualitative research. Each of these stages is expanded on in this section. It is important to remember that all three stages of the overall data analysis overlap and often happen simultaneously. Qualitative analysis of this sort happens from the beginning of data collection and does not wait until the end of data collection to begin. Because the collection and analysis are occurring in tandem, the earlier analysis inevitably affects later data collection and analysis. Fetterman (1989) stated that "Ethnographic analysis is iterative, building on ideas throughout the study" (p. 88). Spradley (1980) noted that analyzing your initial data leads to later, more focused observations.

In this way, the analysis of this study mirrors Gargarian's (1996) view of design as open-textured and reflexive, where the questions that are asked and answered early in the design process affect the types of questions that are possible to ask later in the process. In this way, it is possible to see this study as the *design* of a dissertation.

Description

Rich description is at the heart of any qualitative study (Wolcott, 1994), and much of my time was spent creating a rich, narrative description of the observed events from my expanded field notes. This was an important stage of the overall data analysis, because it immersed me even more into the details of my observations. It was here where the experiences of the participants

and the researcher's observations became the data that were used in the later stages of the analysis, and in the final written presentation.

Analysis

For Wolcott (1994), the analysis phase of data transformation is where the data are rigorously coded and systematically organized in an effort to make sense of it. The analysis of my data involved a thematic analysis that grew inductively out of the data collected. An open-coding method (Strauss & Corbin, 1998) of coding data was employed on field notes and interview data. To do this coding, I moved my field notes and interview transcripts from Microsoft Word 2004 into TAMS Analyzer (Weinstein, 2006), an open-source, Macintosh-based qualitative data analysis application. Because of the bulk of data in a qualitative study, the coding of data is necessarily selective (Miles & Huberman, 1994), and the coding was focused by both my conceptual framework of communities of practice (Lave & Wenger, 1991; Wenger, 1998) and my research questions. This method generated many more codes than I would be able to use at the end of the analysis, but through an iterative process, I clustered the codes (Miles & Huberman, 1994), that is, I merged and reclassified data until it began to represent a meaningful framework. While coding data, analytical memos were attached to both codes and important data passages to better expand on their meaning and their relevance for my research questions. Other data were then linked as well, such as notes from my research journal and from collected artifacts.

Interpretation

The benefit of viewing qualitative data analysis through Wolcott's (1994) lens is that the researcher is allowed in one step, analysis, to make sense of the data using rigorous, scientific

methods, and in another step, interpretation, to give a more open, subjective account of the data. It presents a method roughly analogous to the findings/discussion split often seen in quantitative research. In this final part of the data transformation, I pulled together threads and themes from the previous sections, and I open up the study for discussion.

Trustworthiness of the Data and Its Representation

In a qualitative research study, where the researcher is the primary instrument of analysis, it is important to make sure that the data and interpretation in the finished work is an accurate and trustworthy account of all that was observed. This was tackled in several ways. The first was by the triangulation of data from the different sources I collected – field notes, informal interviews, semi-structured interviews, focus-group interviews, my research journal, and archival data. Themes that occurred and reoccurred in these different data sources were considered to have a high level of trustworthiness for this study. The informal ethnographic interviews, especially, were used to clear up any confusion I initially may have had about the data. Additional member checks by the participants as this study was being conducted of my data and my interpretation of the data also ensured that I was getting it right.

Researcher's Role and Subjectivities

Participant observation required that I balance a peripheral role in the design team, while standing in the background enough to record accurately all that was occurring. This created a tension between my being both an insider (to the Studio as a whole and the department) and an outsider (to this particular design team and the current iteration of the Studio). The immersion that was required for this approach was gained by my participation in the design team as a "silent

partner," and the team looked at me as their documentarian-in-residence, recording their experiences for posterity. I was present at all design-team meetings, both inside and outside of class and both on and off campus. Because of my experience in the Studio and my background skills and education, it was important that I did not get too actively involved in the design project and that I kept my distance, allowing the team to work on their own. The role I played was perhaps best classified at the level of moderate participation, according to Spradley's (1980) hierarchy of participation levels. I stayed an observer as much as possible, but sitting in meeting with just a handful of people, there were a few times where I became more involved, usually because the team would ask my opinion on something they had designed, and I was too excited by the project to hold back my opinion.

It is a common belief in ethnographic research that ethnographers must position themselves outside the culture they are studying. In traditional ethnography, where the researcher is studying another culture in a foreign land, this is relatively easy. Everything the researcher sees will be unfamiliar and strange. However, when studying our own culture, such as the culture in our classrooms, researchers must make what is familiar to many of us strange to see what is really happening (Erickson, 1984; Gordon, Holland, & Lahelma, 2001).

Perhaps one of most difficult aspects of my study of the Studio for me as a researcher was my closeness to the culture in question. I am a graduate of the University of Georgia master's program in instructional design and development and a former student in the Studio. I am currently an instructional technology doctoral student in the same department, and I have regularly conducted invited seminars on graphic design for the Studio over the past few years.

Additionally, before I came to the university as a student, I ran a business from my home in which I did graphic and web design. I identify myself as a designer twice over, both an instructional designer because of my graduate education and a graphic designer because of my vocation for the 9 years before I returned to graduate school. Because of these experiences, I am both familiar with the culture in question and have definite opinions on design and the design process.

Additionally, having been "academically raised" in the University of Georgia program, I am strong believer in the department's constructivist/constructionist education agenda, so the primary theoretical foundations of the Studio are the foundations of my own thinking. Of course, it is this background that has led me to conduct research in this area, and I also agree with Fetterman (1989) that my familiarity with the research setting allowed me to complete an ethnographic account in the short window of time I had to complete this study.

When I began this study, it had been a few years since I was in the Studio, and some things had changed. Perhaps the largest change had been the addition of a new subprogram for students interested in becoming technology coordinators in their school districts. For these students, the Studio was no longer the center of the master's program; whereas when I was in the program, the Studio was the center of everyone's program. As well, many students, especially those in this new technology coordinator program, did not even come to Athens to take courses. Rather they took most of their classes online or at the Gwinnett University Center outside of Atlanta. Finally, new instructors had taught the Studio courses since I had left, and they had introduced new elements to the courses that were not in place when I was a student. So, the

program was not identical to the one in which I had been enrolled. However, the core of the Studio was generally the same, and I or one of my classmates who graduated 4 years earlier would have recognized the environment for what it was.

Because of this familiarity, I needed to control for my own subjectivities, so that I was aware of when they were affecting my view of the research setting and how the participants themselves viewed things. Ellis and Bochner (2000) spoke of a reflexive ethnography, in which the "primarily focus [is] on a culture or subculture," but in which "the researcher's personal experience becomes important primarily in how it illuminates the culture under study" (p. 740). This study surely had some reflexive characteristics, but even where I did bring in my own thinking on some subjects, I wanted to be aware of when this was happening and how it was affecting my analysis and interpretation of the data.

To this end, I conducted a bracketing interview of myself, where I had a peer researcher trained in qualitative methods interview me using the same questions I asked my participants. By having a record of my own thought on design, the design process, and the Studio, I became better aware of where my participants' views ended and mine began.

Chapter Summary

In this chapter, I described the methodological design for my dissertation study. The design was an ethnographic study of an EDIT 6210 design team in the Studio at the University of Georgia. My participants were the design-team members, as well as other students who come temporarily into the design-team meeting space. Participant observation of this meeting space was my primary data-collection method, and it was augmented by formal and informal

interviews, focus-group interviews, and archival document collection. I used a thematic analysis framed by Wolcott's system of description, analysis, and interpretation to gain an understanding of the data. The next chapter presents the descriptive part of the data transformation, the narrative of the design team in the Studio.

CHAPTER FOUR

DESCRIPTION

This chapter provides a narrative description of the semester I spent with the Sonic Design team in the Studio. It provides a chronological rich description of the events that occurred during the data collection – events that are broken down and categorized in a thematic fashion in the analysis and interpretation. First, however, a full description of the team's project is given.

The Project

The project that the Sonic Design team contracted to do was a series of computer-based educational lessons for grade-school students with moderate to profound intellectual disabilities in a rural Northeast Georgia school district. The team brainstormed various ideas with their client, the students' teacher, and decided on three modules that would be developed in the web-based authoring environment Macromedia Flash, which allowed them to create interactive, multimedia lessons.

The team created a television-based treatment, and labeled their three lessons as "channels" (Figure 2 shows the title screen). The breakdown of the channels follows:

- Money Channel: A lesson on learning the difference between different denominations of money, counting money, and using that money to purchase items (Figure 3).

Figure 2. Project Title Screen

Figure 3. Project Money Channel Introduction Screen

- Weather Channel: A lesson on viewing the weather and dressing appropriately for that weather (Figure 4).
- My Community Channel: A lesson on the stores, restaurants, and other locations in the students' community (Figure 5).

Each channel was divided into two parts: the lesson and the game. The lesson for each channel was a simple tutorial that explained the key points for each module: identifying and counting money for the Money Channel, identifying weather and the appropriate clothing for the Weather Channel, identifying the different stores and locations in a town, what you would buy there, and why you would go there for the My Community.

Each game presented the students with an ability-appropriate activity to apply what they learned in the lesson. For the Money Channel, students had to pay for an item by choosing the correct amount of money from three possibilities (Figure 6). For the Weather Channel, students had to choose the correct clothing from three options for a given weather scenario (Figure 7). For My Community, students were given an item they needed to purchase or acquire, and they had to select the location where they would get that item from a visual list of all the locations covered in the lesson (Figure 8).

Because of the extent of the students' disabilities, the controls for the lessons and games were kept at an appropriate level, and audio was used for all instructions, information, and feedback in the channels. The voices for this audio were recorded by children who were approximately the same age as the students who would be using the software.

Figure 4. Project Weather Channel Intro Screen

Figure 5. Project My Community Intro Screen

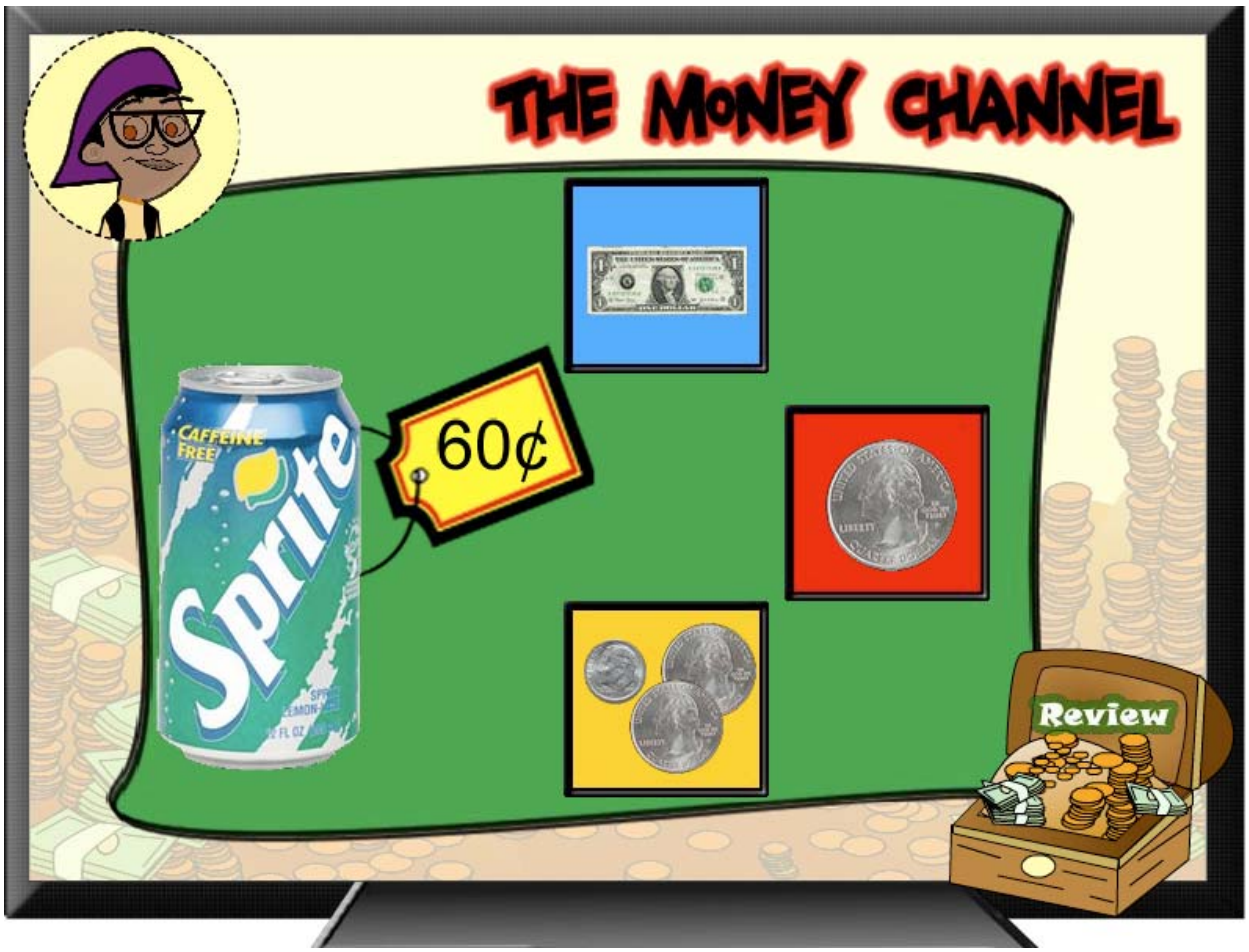

Figure 6. Project Money Channel Game Screen

Figure 7. Project Weather Channel Game Screen

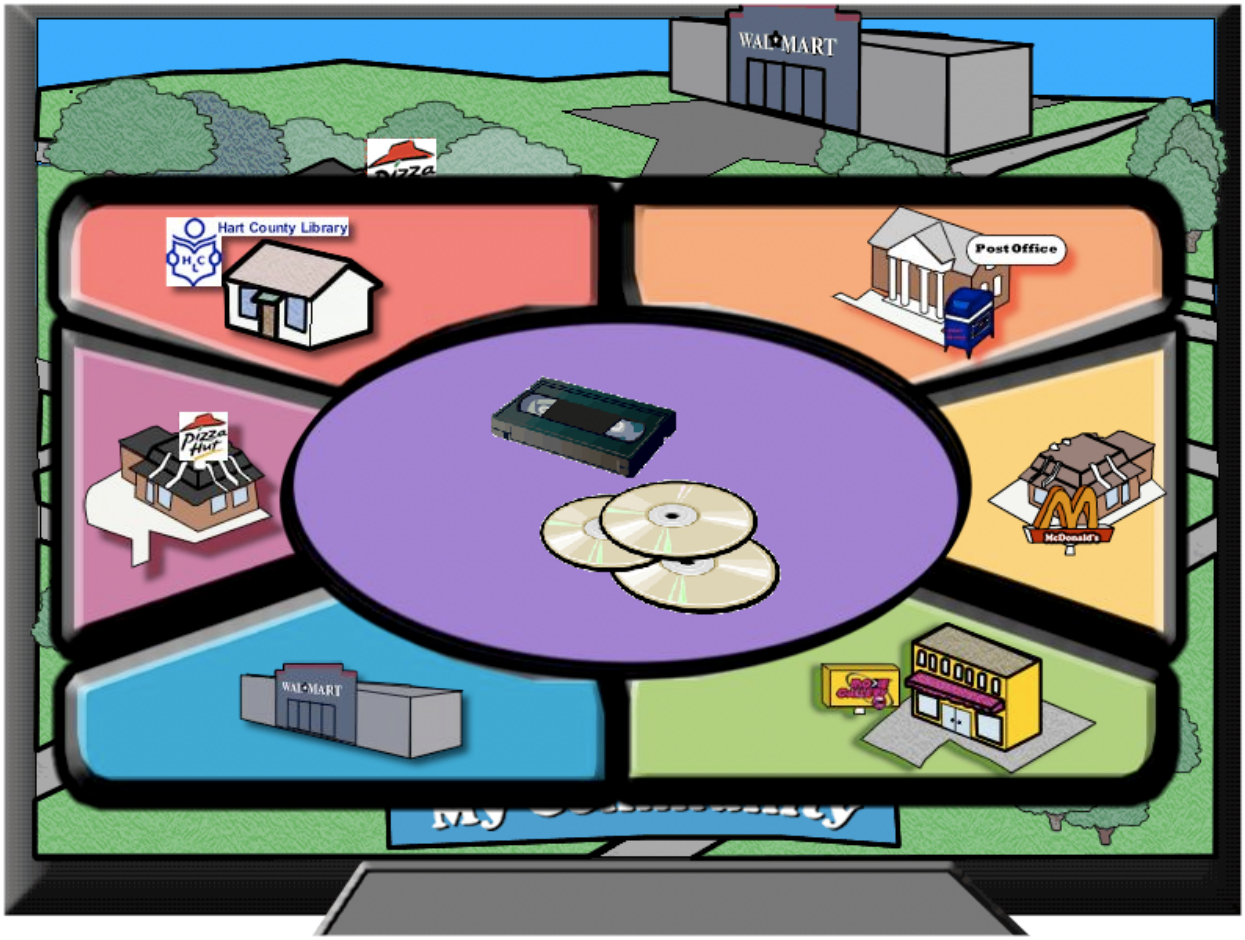

Figure 8. Project My Community Game Screen

The channels were combined in a unified television-like interface, and students were able to choose a channel using an on-screen remote control that appeared in the bottom-left corner of the screen. An audio welcome screen using a cartoon image of the students' teacher and audio of him speaking introduced the three channels (see Figure 2). As can be seen from the screen captures, the design of the channels was simple and colorful, and Tamieka, the lead graphic designer, tried to make it age-appropriate by using graphics inspired by popular television cartoons.

The Narrative

Endings

It is an hour before the final-class Showcase of the semester in the Studio and Sarah is exhausted. The project that she had completed for tonight's class with her team, Sonic Design, was completed easily on time for tonight's final class, but it is always something, and it was Sarah's other Studio project, her independent project for her second time through EDIT 6190, that ran into snags. Last night, Sarah backed up her project, an otherwise smart thing to do, except last night, tired as she was finishing up, she backed up in the wrong direction and overwrote her 2:00AM version, her latest and almost last version, with a version from 12:00AM, a version from two hours and many changes earlier. She was working in Flash, and even after the backup disaster, she still had the final output of the 2:00AM version, an uneditable but complete version which she could have used for her web site. But then that was overwritten when she accidentally compiled the 12:00AM version. So at a little after 2:00AM last night, Sarah found herself hours behind schedule with everything due today at 5:00PM for the final Showcase, the

culmination of the semester. She stayed up until 4:00AM last night, and then worked on it all day, squeezing it in between the three classes she taught today. On top of that, she has to leave for Florida tomorrow to cover final exams for her father, who is going into the hospital for surgery. Everything needs to be done for her today, and by 5:00PM, it is. But she is exhausted. This is in stark contrast to the way her Sonic Design team project had gone this semester. The team project had gone as smoothly as a team project could go, but this is Studio, and with everything that is encompassed under that umbrella term, something was bound to go a bit awry.

But tired or not, Sarah and her team are ready for the final Showcase, where they will be presenting the final version of the project they had been working on all semester. And other than Sarah's last minute individual problems, the team seems well prepared. Before class begins, Tamieka is setting up speakers for the presentation, while Jing is not doing anything project related at all, just getting in a last-minute email check. The instructors are putting out snacks for everyone as the students file in.

Around 5:30PM, the room is pretty full with approximately 50 people, both students and a few visitors, sitting and standing as Lloyd Rieber, the lead instructor, starts the Showcase. Lloyd is very excited to be here at the end of another semester of Studio, and his enthusiasm comes through as he welcomes everyone and talks about the exciting projects they have to show tonight.

After Lloyd's brief introduction, Sarah stands up and presents their project, three lesson modules to help children with moderate to profound intellectual disabilities learn the life skills they will need as they get older. Sarah is an experienced teacher, and it shows in her bearing and the clarity and volume of her voice as she talks to the overfilled room. With Tamieka sitting in

the “driver’s seat” running the computer presentation, Sarah does a quick run through of the project and of one of the modules in the lesson, My Community. The presentation runs smoothly and there is laughter at hearing the cute voice of Tamieka’s niece, who does the voice-over for this module. At the end of the presentation, which only runs 5 minutes, there is a lot of applause for a project well done. Sarah sits down. Over the next 2 hours, fellow students, visitors, and instructors will come by to demo the project on their own. And then, of course, there will be the actual grading of the project, which will happen over the next week, but that is all icing. The project is finished, and it was a hit.

It seems a bit anti-climatic to finish with such a short presentation, one that simply does not have the time to go into all the details and all the work that was done on this project. But everyone knows what it takes to bring a project to completion. Many, including myself, have gone through the process themselves. Others, newer students, have seen them work all semester, and know they will have to do the same next semester. It was a long and hard road that took the Sonic Design team to this point, and yet it was not that long ago. After all, the semester had only begun 16 weeks earlier.

Beginnings

The Studio in the fall of 2004 began in ways both similar and dissimilar to other classes. On the one hand, there were introductions by the instructors and the students, overviews of the syllabus, talk about class requirements and expectations. All the standard stuff you would see in just about any graduate-level class at the university. On the other hand, the actual beginning of

Studio in the fall of 2004 was both harder to pin down and more demanding than a "regular" class, much like the whole Studio itself.

Beginning #1

The first night of class was a mixture of chaos and order. First nights in the College of Education often start late because of students rushing to get here from work, and the limited parking situation around the education building. The combination of three different classes with three different instructors, and with some students taking two classes in the Studio simultaneously, adds to this chaos. The instructors, and especially Lloyd Rieber, the nominal head of the Studio as well as one of the founders of the program, understood this, and did their best to lay things out in an orderly manner. They did this by sticking as close as possible to the standard class opening as possible – going over the syllabus, outlining requirements – while trying to stay on the commonalities between all the classes. This first session of the Studio took place in 601 Aderhold, the largest of all the classrooms reserved for Studio use on Thursday nights. The classroom was wall to wall with students, some sitting in small groups around rectangular tables; others sitting in a long row of chairs that lined the back and side walls of the classroom. After the initial whole-class intro, each class (EDIT 6190, 6200, and 6210) split up for information pertaining to that class alone. That kept students from hearing unnecessary information that did not apply to the class they were taking. But at first, Lloyd and the other instructors were presenting class information that was common for all the students. Even so, the Studio veterans (those students who had taken a Studio class before) had heard most of the general intro, and their attention levels varied depending on the changes that had been made to

the course since the last semester (which could be many, as the course was being continually being refined).

The students I was following were in the EDIT 6210 class, the final class in the Studio sequence, and they had heard all this before. Because of this, there was a lot of low-talk as students who had not seen each other over the summer became reacquainted during the general intro, as well as a lot of checking of email and other distractors. After this hour-long general session, the EDIT 6190 students went with Lloyd for their course-specific introduction in the 616 computer lab. The EDIT 6200 students stayed in the 601 classroom for their course-specific meeting with their professor, Ike Choi. The EDIT 6210 students went to the 613 classroom after the general session for a more focused introduction by their instructor, David Noah. Here it was announced (although it was already known by everyone) that Sarah, Tamieka, and Jing had already formed a group, and since there needed to be two groups, the remaining four students would be that other group. For the Sonic Design team, tonight was far from the beginning of the class.

Beginning #0

The future members of Sonic Design had started their project a semester earlier. Sarah and Tamieka, but not yet Jing, had gotten together to design the "company" web site for their team at the end of the previous spring semester. It was around that time that I had approached Sarah about her (and her team's) participation in my research. At that time, another student, Donna, was also a member of the team, but somewhere along the way, she fell out of the team, and Jing became a member. Sarah's explanation for this was that they felt that due to the limited

number of students in EDIT 6210 this semester, they did not want to hog all the talent on one team, so Donna decided to work on the other team.

This early formation of a team was a step that had been recommended by the instructors for several years. My own 6210 team had been the first team to take advantage of this early formation, and at the time, we caught a lot of flak for it from the other students in 6210, because they believed we had moved ahead without consulting with them. Now, 3 years later, it was standard practice, and the Sonic Design team faced no resistance during the first night's 6210 breakout session when it was announced they would be working together.

The Sonic Design team was ready to go from Day 1. Not only had they come into the semester with their team intact, but they had been in face-to-face and email contact in the weeks before the semester actually started.

Securing a Client

The Sonic Design team may have been formed early, but securing a client was still something that needed to be done now that the semester had started. On the first night of class, neither team has a client, but the other team was just put together, so naturally they had done no work on it. The Studio kept a database of possible clients, and Sarah had used it to find someone in Admissions who needed work done, but she had been unable to contact him. Additionally, Tamieka and Jing worked in the OISD, which was a good place to spot new clients. Team Sonic had no Plan B as of yet, and there was no mention of the client they eventually chose during this first class.

The Sonic Team held a meeting on the Sunday following this first class to do more work on securing a client, and in the few days between class and the team meeting, each member of the team had located potential clients. During the meeting, Sarah and Tamieka rejected a project for a local nature center idea as "not instructional." (Interestingly, this was the client that the other 6210 team chose, and they had trouble with the nature center project for that very reason.) Tamieka had come in with information on working with an African-American organization she was involved with, but they also thought that this project was more marketing than instructional. They also rejected a specific on-campus client because they thought the client would be too difficult. (Tamieka had heard stories.)

The day before this meeting, Sarah had contacted Mark Jones, a former master's student in IT (from pre-Studio days) and a special education teacher in a rural county in northeast Georgia. She had found his information on the Studio database, and in his reply to Sarah he seemed very excited to have been contacted about his project. As Sarah had said in an email to the team in which she forwarded his email, Mark seemed "a bit wordy but [it] may be a good project" (Email, 21-Aug-04). Mark's email was a bit wordy; it was seven long paragraphs of excitement and ideas. Mark seemed an energetic and humorous teacher, which his students probably loved, who used words like "neat" and "cool" on a regular basis.

It was on Mark's idea that the Sonic Design team members quickly began to focus. Their big concern was that he had ideas of using PowerPoint for all the development, but that was not something the team wanted to work with. Sarah had already spoken with him about Macromedia Flash, and he seemed excited.

The team met with Mark Jones, who drove down to Athens for the meeting, on 25-Aug-04, the Wednesday before second class, and they decided to work on his project. According to Tamieka (Interview, 26-Aug-04), the meeting went well. The client had a lot of ideas and "a lot of content," but was "all over the place" and "wants to do so much." But he did seem "really agreeable" and "real accommodating," and "he's going to be really easy client to work with," Tamieka said. Their biggest problem with this client seemed as if it would be reigning him in, and getting him out of his PowerPoint mindset.

Documentation Days

The Idea Right From the Beginning

Right from the beginning of the semester, the Sonic Team had an idea for the treatment of this project. By their meeting on 29-Aug-04, in Week 2, they were already working on the idea of a TV channels theme to organize and differentiate the sections of the product. In that meeting, Sarah drew a flowchart on the board outlining the Weather Channel and how that would lead to the different parts of this lesson. There was no previous mention of this in any meeting or email, but it seemed as if Sarah had been thinking about it quite a bit. The details were not worked out yet, but the basic theme of switching between TV-channel sections was there in full. This was only the second week of class, and they had only secured the client 4 days earlier. It seemed like an idea that Sarah had been sitting on for a long time, waiting for an opportunity to use it. Here was the chance.

Paperwork

Much of the first 5 weeks of the semester was taken up by the analysis of the project and the documentation attached to that analysis. Students in the UGA program are taught an instructional design model called ADDIE (see Molenda, 2003, for a discussion on the origins of the ADDIE model). ADDIE is an acronym that breaks down the design of instructional into five discrete parts: analysis, design, development, implementation, and evaluation. It is an instructional model that owes much of its theoretical underpinnings to behavioral psychology, and it is designed to scale to large projects, perhaps at the expense of smaller projects: ADDIE is popularly believed to be very useful in the organization of a large project for corporate training, but it may be overkill for a teacher designing a lesson for their classroom. ADDIE does work well, however, for the mid-level projects that generally make up the EDIT 6210 projects.

The ADDIE documentation for this project, as broken down in the Studio Handbook (Rieber et al., 2004), required the writing of 14 documents. Table 3 lists these documents in order. Each of these documents must be signed-off by the client, which means the clients must review them to make sure the design team is creating a project that fits the client's needs. The initial documentation for the analysis phase only includes the first six documents (in boldface in Table 3): (a) needs assessment report, (b) objectives list or content/task analysis, (c) project timeline, (d) learner profile, (e) treatment rationale and description, and (f) hardware/software specifications. By document number 7, the screen design specifications, the team had moved on to the design phase of the project.

Table 3

Needed ADDIE Documentation for EDIT 6210

1.	**Needs Assessment Report**
2.	**Objectives List or Content/Task Analysis**
3.	**Project Timeline**
4.	**Learner Profile**
5.	**Treatment Rationale and Description**
6.	**Hardware/Software Specifications**
7.	Screen Design Specifications
8.	Formative Evaluation Plan
9.	Flowchart, Format Sheets, and/or Storyboards
10.	Client Sign-Off Forms
11.	Formative Evaluation Report
12.	Project Activity Logs Analysis
13.	Installation and Implementation Documentation
14.	Project Extension Proposal

Note. Documentation required for the analysis phase in boldface.

From Rieber, L.P., Orey, M., & King, J. (2004). *Handbook for the EDIT studio experience at the University of Georgia.* Athens, GA: The University of Georgia, The Department of Instructional Technology, p. 29.

This initial documentation was completed by the Sonic Design team quickly, and everything was complete and signed off by the client by the end of Week 5. Sign-off by the client was important because it let the team know that the work they had done so far, the direction they had steered the project, was the correct direction for the client. It gave the team the confidence to proceed to the next stage of the project, but it also gave them the contractual footing to *safely* move forward, confident in the knowledge that the client had agreed to everything up to this point, and that the contractual baseline has been moved up to the last sign-off document.

Design Right From the Beginning

Even though this early analysis documentation was finished quickly, and signed-off by Week 5, given the time constraints of the semester, the design team jumped ahead of the sign-off schedule and began designing by Week 4. This was a sometimes risky but common move often taken by other design teams in the Studio. By Week 4, the team held a brainstorming session with their consultants on 09-Sep-04 where they discussed and worked through the treatment, or theme, that would pull everything together. The initial theme they worked on was similar but not exact to the final one used for this project. The TV channel idea, which was used in the final project and was initially brought up in Week 2, was fleshed out during this session with the consultants, but the team was still playing with other ideas that would never make it to the end of the project. One such idea was to use a jukebox, where the students would use their money skills to put money in the jukebox to play a song. This idea was dropped early as they realized the severe limitations of Mark's students. Some other ideas that found their way into the finished project began with consultant input. For example, the use of an animated character as the

narrator for each lesson was originally proposed by Ted, one of the EDIT 6200 consultants. Originally the team was thinking of using live video for this role.

Sarah had run a very tight ship during the analysis phase of this project, and the creation of the documentation. Every deliverable was finished on time or early, and it was all promptly signed-off by the client. It was only once this process was finished, and the team moved into design and development that deadlines began to be pushed back, and the project took on a more chaotic appearance. The high level of organization during the early weeks seems attributable to two things. The first was that Sarah was an amazingly organized project manager, one of the best I have seen. The second is that this early stage was primarily the instructional design phase, which is a major focus of our field, and which is taught in a detailed and systematic manner. The students had been taught to complete these tasks, they had some experience completing them in other classes, and they knew the process they should follow. This was in contrast to later stages of the process, where the teams moved into graphic and multimedia design and development, areas that their courses dabbled in without ever teaching them in the same systematic manner as instructional design. The students were working in an area in which they knew relatively little, and in which they were inexperienced, and thus they had to feel their way through it.

By the beginning of Week 5, before the learner profile, the treatment plan, or the hardware/software specs were signed-off, Tamieka and Jing were already working on screen designs for the general look and feel of the project, while Sarah had jumped ahead to the initial work on the evaluation plan. The Week 5 to Week 6 transition was interesting in that during Week 5, the team's 15-5 report written by Sarah stated that they were "working hard to finish the

design phase" and during Week 6, the 15-5 reported that they were "ready to begin the development stage." It is difficult to say if these demarcations – "design phase" "development stage" – are accurate based on the work they were doing, and it could be argued that they were moving from an analysis phase into a design and development phase, and lots of design work was still to be done on in the upcoming weeks.

Development Days

It was on 20-Sep-04, in Week 6, that the real fun began for the Sonic Design team. That was when they had truly finished all the analysis documentation and began the development phase of the project.

Whiteboards and Storyboards

As mentioned earlier, Sarah had already sketched out a simple flowchart for the Weather Channel during their second work meeting, so the idea that brainstorming and storyboards only started here (on 20-Sep-04) is incorrect. However, it was once the initial instructional design deliverables were completed that the team could turn their full attention to the design and development of the actual project.

Their general working style was to brainstorm on the whiteboards in the 616 lab, creating rough storyboard ideas. Once these ideas were generally hammered out, the team would then move to PowerPoint, where Tamieka or Sarah would create a storyboard using PowerPoint slides based on the whiteboard work. These storyboards were complete as far as storyboards go. If Sarah was the primary computer operator, they would be more basic and text based. If Tamieka

was in this position, she would include more clipart and other PowerPoint-created art to simulate the look of the final project.

The class requirements for EDIT 6210 stipulated both storyboards and flowcharts, and the Sonic Design team scheduled both in their client calendar (see Appendix A for the team's planned schedule). However, flowcharts were an afterthought for this team, and it was in the storyboards that they did all of their work. The flowcharts were created from the storyboards, and were done by Jing only to fulfill the class requirement. From the moment the storyboards were started, the organized nature of the Sonic Team became less pronounced, although they still did a good job keeping the work flowing through the process and from member to member.

Storyboards to Prototypes

The meeting on 17-Oct-04 typifies the workflow that the team used for the creation of their storyboards and the moving to prototypes. During this meeting, Tamieka sat at a computer and worked on the storyboard in Microsoft PowerPoint, with graphics being finished in Macromedia Fireworks. While Tamieka was doing this, Jing was working in Flash, creating the rudimentary timeline. As Tamieka would finalize the graphics in PowerPoint and Fireworks, she would pass them to a networked drive where Jing would pull them down to her computer and insert them into Flash. This went on for the majority of this meeting, and it was a very smooth workflow that facilitated the quick creation of the prototype in Flash. This Flash prototype would later be expanded to be the actual final project.

Lots of Development Work

The general plan for the group that was worked out by Sarah in the role of project manager was that they would complete the first module, the Money Channel, from start to finish. Because the flow of each module was generally the same, the creation of the first module would allow them to create the second and third modules in a shorter amount of time. This plan partially worked. Most of the Money Channel was finished early, but it was not completely finished until Week 12, and small tweaks were made on it until the very end of the semester. Although the Money Channel Flash file was used as the basic template for the other two modules, the transfer from one module to the next was less seamless than they originally thought, especially with the My Community Channel, which worked differently than the other two modules.

Beginning in Week 8, the Money Channel was ready for some of the finishing multimedia touches, such as the recorded audio for the animated characters. The voices for the on-screen characters was supplied by Jing's son (Money Channel), and Tamieka's nephew (Weather Channel) and niece (My Community). Because Tamieka was working on the graphic design, and Jing was working on the programming and development in Flash, it was left to Sarah (with the help of one of the consultants) to record the voices of the children.

Dress Rehearsal

The final goal of all the studio participants is the final Showcase that takes place during the last class period. This is the drop-dead date for completing all the requirements of the project, and everything must be handed in soon after the Showcase is over. The dress rehearsal is usually

2 weeks before the actual Showcase, so the design teams (and the students working individually) get to show their projects to the full class and get a last round of feedback, which they then use to revise their projects before the final Showcase the next week. During the semester I observed the Sonic Design team, the instructors scheduled the dress rehearsal for 3 weeks before the final Showcase because of scheduling constraints. Because the dress rehearsal was so early, most of the projects, including the Sonic Design team's project, were in a much rougher state than is usual for the rehearsal. By the rehearsal, Sonic Design only had the Money Channel lesson completed (with the audio, but without the Money Channel game) and the initial screens for the Weather and My Community channels (with the audio from the Money channel as a placeholder in the other channels). Even so, the rehearsal went well. The team realized all the work they still had to do, but they were comfortable with the amount of time left in the semester to complete the project.

The Rush to the Finish

As already mentioned, Sarah's management of the team was above average, based on my experience being in a team and as a casual observer of other teams, but even so, as the deadline of Showcase approached, the team still had to move into a crunch period and really push to get everything done by the end of the semester. On Week 14, a week before the Showcase, Sarah was still recording audio for the Weather Channel. Jing in particular still had a lot of programming to do in Flash as the final days approached. Even the night before the Showcase, Jing was up until midnight working on the project. An email sent to Sarah at 12:20AM the morning of the Showcase summed up the last bits she had worked on. As the main programmer, she was the last

one working on the project, and Sarah did not respond until the following morning, her email ending with a triumphant (but not quite finished): "WE HAVE ALMOST MADE IT!!!" A few more tweaks made that last afternoon and the team was ready for the Showcase.

The Team's Final Thoughts on the Project

In the end, the team was generally happy with their project. Sarah summed up her feelings after the semester ended:

> I feel proud of the finished project, and I think we did a really good job. And when I look back at projects from before what we had done, and I look at what's going on this semester, it makes me even more proud. Because I think we did a really good job. We had 3 people, and we dealt with an authentic task. We didn't know somebody who knew somebody that might have a project that might have some things finished already. We just had to look through, find a client. Everything we did was very authentic, I think. Going through and meeting with him for the first time, and trying to scale the project down, and then the finished project. I tell everybody about it, and I let people see it, and I think, I'm proud of it. (Interview, 28-Feb-05)

Tamieka and Jing agreed. Sara's point about the authentic nature of the task, especially how they secured a client whom they did not know, was reinforced when she talked about how she sees most projects being acquired:

> I think like somebody in the group says, well, this person might have something for us. And I know this semester, there are 2 projects going on, and both of them

> were sort of gotten that way. And one of them, they have all the documentation and even all the needs assessment, and all the, everything done, up until the implementation. And I mean, one, I can't imagine going into a project doing that, because then you have to decipher it all, and you're not really in it. (Interview, 28-Feb-05)

At the same time they were proud of the project, they also felt that more time would have been useful. As Sarah said:

> That would have been ... it would have been really neat if [the final] Studio [class; i.e., EDIT 6210] was 2 semesters, I think. Because I think you could really do a thorough job with everything you've learned. There were certain things, say the evaluation of the project, there's not enough time to do everything you need to do, so some things get ... [agreement throughout from Tamieka and Jing] (Interview, 28-Feb-05)

During a project management seminar held during the second class, the instructor asked the teams to write down indicators of a successful project. The Sonic Design team wrote down that the project would have a high educational value, hit each level and age group, be of a manageable size, engage the audience with graphics, and that it would have long-term use. In the final group interview, I asked the team how their final project met the early expectations they had for what a good project would be.

Sarah fielded the question and answered:

> I think so. I think that our scope could have been a little smaller. And if we had a smaller scope, the educational value would have been higher, because we would have had more time to spend on, like, more animation, like making the sun move, you know, like those little tiny things would have been good. I always when I look at it and I go through it, I feel like all three of the sections where we just tell the learner what they need to know, it's sort of boring, but there's no way to make it different, because they can't interact with the software, so it would have been ... I guess, I'm just looking into if I was making it for third graders, there would be so many places you could say, click here to find more or do this, and there would be more interactivity, so sometimes I feel that was not there, which we were always taught interactivity was important, but then with the learners we had, we didn't have that ability. So then I guess, we did have some interactivity at the end in our quizzes, but I think maybe smaller scope. (Interview, 28-Feb-05)

The Sonic Design team was generally happy with the finished product. It had been passed to the client, and he was happy with it as well. The semester was over, and they had passed with distinction. Their short time as the Sonic Design team was over, and they were all soon off to their post-graduate careers.

Chapter Summary

This chapter described the events of the fall semester of 2004 when I collected the data for this study. It laid out the narrative of the Sonic Design team's days in the Studio. Chapter 5 presents the analysis and interpretation of the collected data.

CHAPTER FIVE

ANALYSIS AND INTERPRETATION

This chapter details two interconnected tasks in the data representation for this study. First, it analyzes the data collected, which according to Wolcott (1994) looks at what is known for sure about the data. Second, it interprets the data, which brings in my own opinions on the data and connects the data back to the literature review in a similar fashion to a traditional discussion section. These two tasks are combined to avoid any artificial divisions between these two stages of the data transformation and to combine in one location all the relevant analysis and interpretation related to a particular theme of this study.

Studying an environment like the Studio is a complex endeavor, because it is difficult to look at a part without considering the whole. Although my primary focus for this study was to examine how design was being done in a small group of students in one particular class in the Studio (i.e., the Sonic Design team working in EDIT 6210), it was necessary to expand the boundaries of this study and examine the Studio as a whole.

Lave and Wenger's (1991; Wenger, 1998) theories on communities of practice and legitimate peripheral participation form the theoretical framework for my study, and I use that framework, within the context of my research questions, to organize my analysis of both the Studio as a whole and the Sonic Design team specifically.

To review, the research questions that guided this study are:

1. How do theories of communities of practice explicate the way students engage in and negotiate design of an authentic design project within a team-based context?
2. How is the way in which students conduct design within a team-based context influenced by the design-studio model?
3. How do students come to identity themselves as members of the culture of designers in the design team, in the Studio, and in the larger cultures of instructional and multimedia designers? Where and how is value assigned within this culture?

The Studio and the Design Team as Communities of Practice

My first research question for this study was: How do theories of communities of practice explicate the way students engage in and negotiate design of an authentic design project within a team-based context? This section presents the case that the Studio is indeed a community of practice as outlined by Lave and Wenger (1991; Wenger, 1998), and then it describes specific themes within the data that are best explained through the community-of-practice framework.

According to Wenger (1998), communities of practice are primarily focused on "learning as social participation" (p. 4), that is, as opposed to a more traditional instructor-led classroom, "there is very little observable teaching; the more basic phenomenon is learning" (Lave & Wenger, 1991, p. 92). Perhaps a better description of the Studio could not be found.

In describing a community of practice, Wenger (1998) outlines what it is not. It is not simply belonging to a group or organization, it is not merely a network of interpersonal

relationships, and it is not formed just through geographical proximity of persons to one another (p. 74). Although studio has all of these characteristics, in accord with Wenger's model it has much more.

The Studio's "Fit" Within the Community-of-Practice Framework

From the background articles that have been written on the founding of the Studio, it is clear that constructionism and situated learning are the foundations of the course. Communities of practice provided less inspiration for the Studio, perhaps, but only because of timing. The Studio was initially set up in 1998: Lave and Wenger's work on legitimate peripheral participation was already out for a few years, and legitimate peripheral participation and situated learning were taken into consideration in the founding of the Studio. Wenger's follow-up work, *Communities of Practice: Learning, Meaning, and Identity* was not published until 1998, however, so much of what is in that text had not yet dispersed through the IT community when the Studio was being created. This is one reason why it is so interesting to see how the Studio aligns with communities of practice.

Wenger (1998) outlines four dimensions for the creation of a learning environment founded on communities of practice. He described these four dimensions as dualities that must be addressed when designing a community-of-practice–based environment:

- *Participation/Reification* refers to the duality between taking part in the action of the community and the actual objects that are created from and represent this action.

- *Designed/Emergent* refers to the duality between communities of practice that are designed by the instructors and the communities that arise naturally from the learners themselves.
- *Identification/Negotiability* refers to the way a designed environment creates possible ways in which a learner can identify with the community. This is in contrast to space made for the learners to negotiate their own ways of identifying with and modify the environment and the community to their own needs.
- *Global/Local* refers to the duality between the community of practice as it exists in the local learning environment versus the larger community of practice of which it is a part. It also refers to the tension between the local community and the outside lives of the learners who become a part of that community.

Next, I take a look at each dimension as it applies to the Studio.

Participation/Reification

The Studio does a good job at translating student's participation into reified objects, whether these objects are documentation related to the instructional design of the project or the project itself. Right from the beginning, with EDIT 6190, the reification of practice, and the construction of knowledge is moved to the forefront of the course, both in the way the instructors lead the course, and in the way the students complete their coursework. This carries through until the last course, EDTI 6210, although it is interesting to note that as the scaffolding is removed, the projects move from being constructionist objects bounding to students' learning to actual objects created for external subjects (i.e., the clients). The students initially create less

authentic objects for their own learning, and then by the time they are creating larger projects for clients, they should still inherently understand how they continue to learn through the process of design and creation.

Designed/Emergent

Perhaps the most interesting dimension of Wenger's framework as applied to the Studio, and perhaps the most success the Studio has shown, both in the time I studied it and over the time of my involvement, has been in the dimension of designed/emergent. As the founders of the Studio initially did when creating the Studio, the current instructors of the Studio put a lot of upfront time and effort into laying the groundwork for the Studio at the beginning of each semester. It is, perhaps, hard to fathom without direct experience how a course that has a 48-page syllabus/handbook can still allow the students to carve out so much space for themselves. The design of the Studio has many elements designed to contribute to the community of the Studio, some such as team-based work, design crits, service hours, student consultants, which go back to the beginning of the Studio. Some elements, however, such as mandatory attendance for the first 8 weeks and pizza nights, have been redesigned into the course in response to some problems that were observed in the running of the Studio. Additionally, there are many other aspects of the Studio community of practice that have emerged out of the community of students itself.

As seen in the semester I collected data, the grouping of students around master-peers, often based on ethnic origin and/or gender (Tamieka and the African-American students; Jing and the Asian female students) was one instance of an emergent sub-community in the Studio. Likewise, the design teams that are required by the class (and so are designed) sometime emerge

as true communities of practice (and I would make the argument that this was true for the Sonic Design team), although from my experience this is not always the case (sometimes a design team is just a team that completes a project).

Identification/Negotiability

The Studio has many elements that help students build an identification with the community of practice and provide them resources in negotiating meaning as a community. The course sequence is a good example of a designed building of identity and negotiability. Students begin in EDIT 6190 as "first timers" in a course where they are immersed in a constructionist learning environment. This gives them the ability to develop tools skills, as well as gives them experience in an environment that is based on the theoretical foundations of the Studio as a whole. It also gives them the ability to hone their design skills and begin to identify themselves as designers. The second class in the sequence, EDIT 6200, ramps up their emersion as designers by making them create an instructional project for an actual client. The third class, EDIT 6210, enables the students to team up with their classmates in their own miniature community of practice.

Local/Global

The final dimension of Wenger's (1998) design framework for communities of practice is also well represented in the Studio. By design, the faculty bring in practicing instructional designers and other industry figures who connect the students with the larger world of instructional technology and design. The faculty also bring in other people to teach seminars in the Studio, including former students and current doctoral students (both categories under

which I fall, and I have been invited to the Studio every year since I graduated with my master's degree to teach a 3-hour graphic design seminar). The department community also interacts with the Studio as clients, and many of the projects that EDIT 6200/6210 students do originate with doctoral students or other IT faculty. In the same way, many COE faculty members also connect with the Studio as clients.

Designed and Emergent Community

Wenger often talks about how community is not something that can be designed, only planned for, yet he acknowledges the need for instructor-created community through his use of the designed/emergent duality in his dimensions of a learning environment created around the community-of-practice framework (Wenger, 1998). The community of the Studio incorporates aspects of both designed and emergent communities. On the one hand, the Studio, as it has been designed, provides the necessary social space for the creation of emergent community by the students; on the other hand, the Studio instructors have, at various times, tried more direct methods to create community within the Studio. Some of these more direct attempts at community creation have been more successful than others.

Special Interest Groups

Over my time enrolled in, casually observing, studying, and teaching in the Studio, the faculty has played with the idea of a special-interest group (or SIG) as a means to create communities of learners around specific topics (e.g., graphic design, educational games, usability). When SIGs were first introduced into the Studio, three different SIGS were scheduled for the same times in a single semester; the idea being that students would pick the one that

interested them the most and focus on that one to the expense of the others. In later semesters, the faculty began to schedule SIGs at different times in the semester, so theoretically, if they were inclined, all the students could go to every SIG. In both cases, attending a SIG was a class requirement, and students were required to attend at least one. The SIGs were sometimes taught by faculty members, sometimes by outside instructors (e.g., I have taught a graphic design SIG for the Studio several times), and sometimes even by students enrolled in the Studio (e.g., the first time I taught the graphic design SIG, I co-taught with a master's student currently enrolled in the course; in the semester I taught in the Studio – post data collection – a current student co-taught a SIG with one of the instructors).

In the semester I studied the Sonic Design team, the faculty changed the format of the SIGs. That semester, a single three-class seminar on the design of database-driven web content was taught by the three instructors of the course. They called it a "design seminar" but it was also referred to as the "design SIG." (It was introduced by the faculty and seen by the students as a SIG replacement.) This seminar took place during Weeks 6 through 8, and attendance by all the students was required. This seminar was not held in high regard by the Sonic Design team members. In response to my question about did she "get anything" out of the design seminar, Sarah replied,

> No (laughs). I already knew what a field was and a row and a column and a database…. I didn't like it…. I mean I think they should do a design SIG where they teach people about design. Nobody knows about design…. It was just them talking about their work, and about what they do, I thought. It wasn't teaching us

> anything. Now I'm a little bit interested – like what Ike was talking about, the collaborative learning database stuff, just because I've done databases, so that was a little bit interesting, but – I didn't even go to the third one. I missed class that night. I think it was better the way they had it, just with the SIGs. You know, they had "photo SIG" or "design SIG," and like you could at least pick what you're interested in, and not just all have to sit and listen … People were falling asleep (laughs). (Interview, 26-Oct-04)

In this reply, Sarah seems to be using the term "design" to mean "graphic" or "multimedia" design. Tamieka had an equally harsh assessment of the design seminar:

> I don't like that management thing, whatever they did – I don't know what that was – but I didn't like it. You know, when we had to go in and learn about databases. And it was OK for me –not really – but I understood some of it. Like I understood like a reason why you could do something like that. But by talking to a lot of 6190s [students in their first Studio class], for the first time, they don't understand anything … (Interview, 12-Nov-04)

In the end, it seemed like the faculty, as well, understood that this experiment with community creation and seminars did not work. By the time I taught in the Studio three semesters later, they were back to the original SIG model, where students could choose which ones they wanted to attend.

Mandatory Attendance

Attendance is a traditional class requirement that has been rethought for the Studio. Originally, the Studio was seen as an open environment where self-motivated students would choose to attend sessions and community among the students would naturally arise. Early semesters of the Studio only had three or four required classes, with one of these being the dress rehearsal and one being the Showcase. All other classes were optional, with some required sessions, such as SIGs, taking up only 1 hour blocks during some of the 3-hour class sessions. In this system, sometimes a strong student community would develop (as it did when I was a student) and students would voluntarily come to many of the sessions. Other times, this did not happen, and the faculty began to change the requirements.

The semester of my data collection, the instructors' implemented a new policy that made the first 8 classes of the semester mandatory, in an effort to get the Studio community to form. The remaining classes were optional, except for the dress rehearsal and the Showcase, but the faculty hoped by that point, a strong community would be formed. This mandatory attendance was looked upon by the older students, who had been in Studio before this was implemented, as an unnecessary imposition. Tamieka's comments were representative of these feelings:

> I don't think it's going good at all. As a matter of fact, I don't like it…. I don't like the forced community thing…. I formed community based on my interests not based on where I sit in the lab. You know what I'm saying? And I think a lot of the 6190ers, I think, this time, a lot of them don't have any technical, have the real strong technical skills. So they're there because they have to be there, they have to

> get some help. You know, and they know people are going to help them… But, by us having to go through it the first time without any community or whatever, and then having to go through it ... The community that we formed when we were first starting out, with the exception of, you know, some things, um, it's pretty much the community that we're on with the 6210 team. (Interview, 12-Nov-04)

However, she did seem to think that it could be a good move for students who were just starting out in the Studio:

> … with the first generation here, that as they go through it, they're going to keep doing it more…. So it's almost like, I think if they ... but if we started out doing this whole community, I think it would have been carried better throughout. (Interview, 12-Nov-04)

Sarah as well saw the benefit for the new students, although again for herself and the older students, she did not see the value:

> Sarah: … I think for the people who are starting from the beginning, the first timers. I think it's actually going pretty well for them. Last Thursday, when you were in Chicago, we, you know, had our meeting at 5:00, and we had, I think, 5 different 6190 people come to our meeting…. once our meeting was over, they just all sat and worked together. So, it seems they're forming that type of community. There were a lot of them in there for Studio time, and

it wasn't mandatory or anything. They still were there working on their projects, scanning things in and so on.

Researcher: So maybe the first 8 weeks of mandatory actually ...

Sarah: helped out?

Researcher: … helped, that they feel that they should just be there.

Sarah: Uh-huh [Yes]

(Interview, 26-Oct-04)

So in the end, the Sonic Design team felt that mandatory attendance was beneficial even though it limited somewhat their freedom as experienced students in the Studio.

Student Community in the Studio

The community of students in the Studio, that is the community of practice of students involved in the creation of educational multimedia projects, both because of and in spite of instructor efforts, was a robust community that was both similar and dissimilar from the communities of students that exist in more traditional classes.

The Studio community of practice displayed many of the characteristics of legitimate peripheral participation. It was an environment "where learning [was] an integral and indispensable aspect of social practice" (Lave & Wenger, 1991, p. 31), where there was "little observable teaching" (p. 92) but much learning, and where conferring legitimacy was "more important than the issue of providing teaching" (p. 92).

The students of the Studio are clearly on a learning mission. In the language of communities of practice, they are mutually engaged in the joint enterprise of developing their

multimedia products and learning the technology skills that will allow them to develop the products. These skills, this shared repertoire of knowledge and techniques, are passed from student to student, from instructor to student, and even from student to instructor throughout the course of the semester.

The student community fits Lave and Wenger's (1991) community of apprentices in which "benign community neglect" (p. 93) (in this case, neglect by the larger IT community, which included the instructors, other faculty, and other professionals) allows the learners to create their own space for learning and their own relations to other learners. Just as in the traditional apprenticeships catalogued by Lave and Wenger (1991), the students "learn mostly in relation with other" students (p. 93).

This sharing of repertoire between learners, this learning without observable teaching, is an important characteristic of the Studio student community. It was telling that during the final interview with the Sonic Design team (which was held 2 months after the class ended because of scheduling conflicts), after I asked a question about what they learned in Studio this semester, there was a long pause as they all struggled to think about what it was they had actually learned in the semester. Finally, Tamieka and the rest of team answered, yet their answers showed some of the confusion:

> Tamieka: You know, I don't think we learned anything that they ... like I feel what we learned, we learned from each other, and from our client. We didn't learn anything from – well I wouldn't say anything, but I

think we learned very little from our professors. I think they were really hands off, and so ...

Sarah: That's sort of the nature of Studio, though,...

Tamieka: Yeah. Well – yeah, that's true. I don't know. I just learned ...

Jing: cooperation.

(Interview, 28-Feb-05)

Finally, Tamieka focused on learning teamwork rather than any specific technical skill:

> Cooperation. Yeah, and I think being flexible. I think I learned that, and also too I learned not to be a perfectionist on a lot of things (laughs), because it doesn't really matter. In the big scheme of things, I've learned to kind of back up from it, and not just, you know, kind of be tunnel vision where you're just going down this one path, and not being able to bend if you have to bend, you know. I think that's the biggest thing I've learned. And also, I've learned too, to work like more in a team. I think, [Jing and Sarah agree] we had to rely on each other. You know, there were things I couldn't do, and there were things you all could do better, and it was like, vice-versa. And it was like, we had to kind of work as a team. And I think I really learned the true meaning of teamwork, because you know before, people talk about it, but you know, when you get in a project like this, you have to really do it to be successful. I think that's all. (Interview, 28-Feb-05)

Sarah built on this:

> I think I learned, too, just that when you, I mean if we were to take a class and just sit in a room and learn about things, we ... I'm sure we would learn maybe textbook stuff, but I think that I put in probably twice as many hours as I would have in a normal class, because I was interested in it and I felt some sort of responsibility towards it and it was a real project. And I think we did, because we took it seriously,... So I learned that that definitely makes a, as a student and a teacher, that students need projects that are real like that. And I think we all learned how to put things together. Like we had gone through instructional design before, but when we got to doing the needs assessment and task analysis, I brought our old notes back and handed them out, and we had to go back over, well what really is that. Even though we learned it then and created a couple things, we didn't do it for real [until the EDIT 6210 project].
>
> (Interview, 28-Feb-05)

Jing, too, reinforced these ideas, by focusing on learning to be flexible:

> I think I learned how to work with my team members and work with a client, and especially we cooperatively worked together and on a timeline, so we have some kind of, is it flexibility? And I learned about doing a real project from the beginning until the evaluation part … (Interview, 28-Feb-05)

As they discussed, they realized that they did learn some technical skills:

> Sarah: I think I learned, I don't think I learned much about the tools because I felt like I knew them, but I think as a team, we all learned

how to organize our files and collaborate to put them all. Like the first one was the Money Channel, and I don't think we did a good job of it. I mean we redid things over and over again, and Jing would do it before it was done. But by the third one, it only took a couple weeks, because we knew, OK, we need to have all of this done, and we need to give it to Jing, so it just seemed like it went a lot faster as far as production. I mean if we had to do it over again, we'd probably be really good at it.

Tamieka: I think visually, like graphic wise, I learned how to use the pen tool, and take a picture and sketch around it. And I even look at the graphics we did in the beginning, I think they're not as good as the one we did towards the end. But it also, like Sarah was saying, it didn't take long to do those ones towards the end too. And I think we learned, was it PeakDV [an audio-editing program]? (Interview, 28-Feb-05)

Putting teaching and traditional learning in the background is a common characteristic of communities of practice. Lave and Wenger (1991) saw traditional learning and teaching, as well as the relation between teacher and student, as taking a backseat to the conferring of legitimacy on the students – making them active members of both the local and global community, in this case the community of instructional designers and developers.

In the Studio, the students are apprenticing in the larger community of practice of instructional technology professionals. From their actions and their words, the members of the Sonic Design team felt that they were a part of this larger community. They all identified themselves as instructional designers, developers, or multimedia designers in their interviews. Additionally, they all acted like professionals, both in the undertaking of their project (and their interactions with their client), and in how they mentored newer students. This peer mentoring is discussed more fully in the Peer Masters section. This notion of masterful peers is a vital aspect of the Studio, because although they take part in legitimate practice and it is peripheral to the larger field of working IT professionals, in the scheme of the Studio much of the work they do is central to the community of practice that makes up the Studio itself.

New students in the Studio, in the first class EDIT 6190, complete projects that are peripheral to the larger field of instructional technology, that is, they are learning multimedia and web design and development, which are necessary skills for the IT professional, but they accomplish these learning goals without completing the central instructional-technology task of instructional design. Because of the constructionist nature of EDIT 6190 and the students' ability to choose their own projects, their taking part in legitimate peripheral participation is partially disguised, and they more readily display more traditional legitimate peripheral participation when they sit in on the EDIT 6210 design teams as EDIT 6190 students, and when they consult with the EDIT 6210 design teams as 6200 students. However that is only a part of the practice they take part in the Studio, and as the students advance in the Studio, they take on more and more the mantle of masters themselves and are doing work that is most central to the practice in

the Studio. By the time students are in the EDIT 6210 class, there is a good possibility, as occurred with all three members of the Sonic Design team, that the students will in effect become the masters in the class. This master-peer position is more central to the Studio than that of the nominal masters, the faculty instructors.

Peer Masters

Lave and Wenger (1991) talk about the "benign community neglect" (p. 93) that leads peers to seek out other peers for the information and education they need. "Even in the case of the tailors, where the relation of apprentice to master is specific and explicit, it is not this relationship, but rather the apprentice's relations to other apprentices and even to other masters that organize opportunities to learn;…" (p. 92). My observations of the Studio revealed that certain students, including all three members of the Sonic Design team, were filling a role far beyond that of a more knowledgeable peer. These students filled in the vacuum created by the instructors' benign neglect of the Studio student community. These students were labeled "peer master" to better differentiate this expanded role. Peer masters were those students who had been in the program long enough and had enough skills and talent to, in effect, become a master to other students.

This is unique to the Studio and differs from Lave and Wenger's (1991) vision of the modernized apprenticeship model in legitimate peripheral participation and communities of practice, because as one of the Studio founders has admitted, with the rapid pace of technological change and the continual release of new development tools, it is impossible for the instructors to be knowledgeable about every new tool and technique. This is an area where the students are

sometimes more advanced than the instructors. For example, in past semesters of the Studio, new web technologies, such as JavaScript and Active Server Pages, and new development environments, such as Macromedia Flash, were first introduced into the Studio by students rather than by the instructors. Over time, these technologies and tools became part of the standard Studio toolset, and the faculty gained the proficiency to teach and support the tools.

The Sonic Design team members, likewise, brought knowledge and skills to the Studio that no one, including the instructors, had. Sarah had an undergraduate degree in computer science and had a lot of experience in database design. Jing, as well, had a background in computer science and was a highly skilled programmer. Tamieka was one of the most proficient graphic designers and artists I had seen in the Studio; again, a skill set that most of the instructors did not possess. (During the semester of my data collection, David Noah, who is an excellent and experienced graphic designer and artist, was a part-time Studio instructor and the instructor for EDIT 6210.) But it was not only the advanced skills that made some students, and not others, peer masters. It was the confidence in their legitimacy as full members of the IT community, and the presence they had in the class as people other students could go to for help, that solidified this position.

The members of the Sonic Design team were, in turn, recognized by the other students for their peer master positions. Tamieka, for example, was awarded the Allen Bullock award for studio "selflessness" during this semester. This award is given to the student (or students) who is recognized by his or her peers for giving a lot of time to helping others. This unique award is given to the student who does this high level of service seemingly without thinking about it. To

paraphrase Lloyd Rieber, if you think you deserve it, you probably don't (Field notes, Class 1, 19-Aug-04). In many ways, Tamieka was the central resource and unacknowledged leader of the African-American students in the Studio, and especially of the African-American women. Tamieka talked about how this made her feel and how she saw it as her responsibility:

> It felt good. I feel like because they were new, I felt like I was almost teaching them almost the ropes. Because when we went through, we really didn't have anybody to kind of mentor us a little bit. I almost feel like I was obligated to kind of mentor them a little bit, because when we went through we didn't have anybody to kind of help us out. We kind of helped each other, you know. (Interview, 28-Feb-05)

In many of the ways that Tamieka was the central peer masters for African-American women in the Studio, Jing played the role of peer master for many of the Asian women in the Studio, especially those women who spoke Chinese, those from mainland China and Taiwan. During class meetings, and especially during the dress rehearsal and Showcase nights, the Asian women in the class would crowd around Jing, asking her questions and for advice. Jing, in her typical understated way, did not have much to say on this topic when asked during an interview, but she did say that, as the semester went by, she felt more "comfortable because I got a lot of help from Sarah and Tamieka, and they are very nice,… and helped me a lot." As in other situations, this transfer of praise or an acknowledged leadership role was passed, by Jing, onto her fellow Sonic Design team members.

Sarah, as well, found herself mentoring many of the newer students. But her help was different in some ways, because unlike Tamieka's attraction of African-American women and

Jing's attraction of Asian women, Sarah decided early on that she would be there to help the EDIT 6200 consultants who were attached to the Sonic Design team, and she actively looked to help them on their projects.

The Sonic Design members were aware and flattered by the attention given them by the newer students:

Tamieka: … I remember when we first started and we had our little break out session and they were trying to kind of force community, we had that big general session. And it was weird because we were sitting up against the wall ...

Sarah: And that was when they all sort of crowded around us.

Tamieka: Yeah. Yeah. And it just felt really good.

Sarah: Yeah. It was really weird because they were all kneeling, remember? And we were sitting there looking down.

Tamieka: Yeah (laughs).

Sarah: They were all very nice.

Tamieka: Yeah. Yeah. Yeah. And I think a lot of people tell me too, they tell me they go back and look at the old pages, and the old projects, and I think we all won blue sock awards. And I think that kind of lends a lot of our credibility too, you know what I'm saying? Because they all kind of came and gravitated towards us, and I

> think they just looked at our stuff online and saw that we did pretty good work, you know?
>
> (Interview, 28-Feb-05)

One could argue that within the larger community of practice that is the whole Studio, the design teams that are created for EDIT 6210 constitute their own community of practice, perhaps the most active communities in the entire Studio. These teams created to fulfill the course requirement for EDIT 6210 work more closely together and are much tighter than any other community in the Studio.

The Culture of Critique

A design-learning environment of any form, but especially a design studio, requires some sort of critiquing mechanism to give students feedback on the progress of their designs. In a design-studio learning environment, a design critique is the "central means of conveying design knowledge" (Reimer & Douglas, 2003, p. 194). For example, in the traditional architecture studio, the primary space for teaching is during the instructor-led design critiques. The Studio is no exception, but it adapted the design critique to fit its own theoretical framework. The primary means of critique in the Studio is called the "desk crit." The major difference between the traditional design critique and a Studio desk crit is that, in the Studio, the desk crit is student-driven rather than instructor-driven. Every student in the Studio, regardless of the enrolled course, is required to complete four desk crits of other students' work. These desk crits can be completed at any point in the semester, although they are often done at the dress rehearsal, which is often described by the instructors as the final opportunity to give and get some feedback. Desk

crits are sometimes given in person, with an email follow-up to document the course requirement, and are sometimes given in email only after the project is viewed online.

The student-driven desk crits are in keeping with the student-centered nature theories of constructionism and situated learning around which the Studio is founded, and this move, in many ways, has humanized the Studio in a way that the architecture studio is struggling to do itself (cf., Koch et al., 2002, and its discussion of needed revisions to the architecture design studio). In the architecture studio, the design critiques may be the teachable moment, but it is also the moment during which the students feel most vulnerable, and there is a feeling that the critiques are punishing to the students. By making the desk crits in the Studio student-driven, the instructors of the Studio have taken away this pressure and the punishing effect of public critique on the students.

However, some things have been lost. In my observations, the desk crits are often very superficial glances at a project in an effort to fulfill a course requirement, rather than a detailed look at the design of the instruction and the media. Students generally focus on easy to critique look-and-feel issues (e.g., color, layout, typefaces) rather than the underpinnings of the design. Rarely is the instructional design critiqued. For example, an emailed desk crit received by the Sonic Design team on 14-Oct-04 thought that "Bright and bold color colors are very apparent" and that "Your 'channels' look as if they will be easy to use." The best advice that the reviewer could give was to "add into you design items that associate the 'channel' with the character [e.g., an umbrella for the weather channel character." Another desk crit sent on 16-Nov-04 simply

praised the look of the project with "Your project looks so awesome! I love the color scheme" with a few suggestions for font usage.

At first glance, the reason for this seemed to be the limited amount of time the students had in the semester, and their feeling that only work dedicated to their own project was important. Perhaps this is the only reason, but if we consider Lave and Wenger's (1991) theory of legitimacy, perhaps the reason for superficial desk crits is a lack of legitimacy on the part of many of the students, and the thought that they do not feel that it is their place to teach – if the critique is the primary means of teaching in the design studio – other students about design. There may also be a fear in the students that if they are too tough on their fellow students, their fellow students will either be too tough on them or they will become angry at them for their honesty. Because of this, desk crits are very watered down in comparison to the architecture design critique, and little teaching or learning occurs during them.

Final Thoughts on the Alignment of the Studio Model with Communities of Practice

The purpose of this question was to see how the IT Studio fit the framework of communities of practice as outlined by Lave and Wenger (1991) and Wenger (1998), and then to use the framework to explicate the way students engage in and negotiate design within the Studio. After answering this question, I would describe the Studio model as being in a near perfect alignment with Wenger's theories related to an instructor-designed community of practice. Whether one looks at Wenger's (1998) four dimensions that must be wrestled with by designers of a community of practice (participation/reification, designed/emergent, identification/negotiability, global/local), or one looks at Wenger's characteristics of practice in a

community (mutual engagement, joint enterprise, shared repertoire), or one looks Lave and Wenger's (1991) underlying idea of legitimate peripheral participation (i.e., inducting apprentices into the full world of the community of practitioners), the IT Studio aligns closely with the framework. In many ways, the IT Studio can be seen as an exemplary model of a community of practice.

Doing Design

My second research question examined how the way in which students conducted design within a team-based context was affected by the design-studio model. My analysis around this question is neatly summed up by the title of this section, "Doing Design," because it is the doing of design, the practice of design, where all these issues were negotiated.

My definition of "doing design" is broad, referencing Perkins (1986), who sees the practice of design as answering questions posed while creating a "structure adapted to a purpose" (p. 2). I also look at Gargarian (1996) who divides the practice of design into two types: environment design, where the designer is "constructing skills and organizations of them so that they can be easily found" when needed; and artifact design "selecting the organization of skills from which particular skills are then selected and applied" (p. 140).

Gargarian's (1996) two types of design might be better thought of as a continuum of design. At one end is the construction and organization of skills; at the other is the creation of artifacts. This overlays neatly with the sequence of courses in the Studio (Figure 9). At first, in EDIT 6190, the students are primarily doing environment design in that they are learning the skills they will use in later classes. The EDIT 6170 prerequisite in instructional design, which is

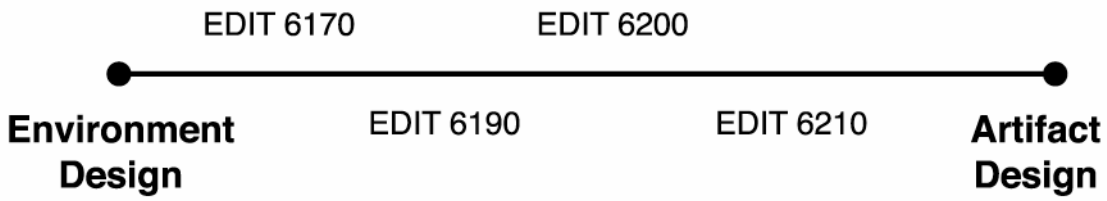

Figure 9. The Continuum of Design Overlaid on the Studio Courses

outside the Studio sequence, is also primarily concerned with setting in place design skills the students will need later. Of course, both of these classes are still project based, so they are not pure environmental design, but they sit closer to that end of the continuum. In EDIT 6200 and EDIT 6210, the students move closer and closer to an authentic design project, and there is usually little environment design, rather the construction of the project, the artifact, is the primary goal.

This is not always the case, however, and sometimes the students need to move back into environment design to fill in skill gaps that appear only after undertaking the artifact design, or to design a process that is going to be reused throughout the project. In the case of the Sonic Design team, Sarah had to go back to her notes on instructional design (from EDIT 6170) and to refer to previous EDIT 6210 projects to grasp how the design process and documentation for the project would be organized over the semester. Later, during the development stage of the project, Jing and Tamieka used the artifact design of the first channel (the Money channel) to create the environment design, both the development templates and the development process, that they used for the next two modules. These examples show how designers switch between the two types of design.

Time Spent on Tasks

The overall tasks of the semester can be grouped into larger chunks by viewing them through the ADDIE model of instructional design (see Molenda, 2003, for a discussion on the origins of the ADDIE model), which is the model that students are taught in the UGA program. ADDIE is an acronym for the major steps in creation of an instructional product: Analysis,

Design, Development, Implementation, and Evaluation. Table 4 lists the weeks spent on each step of the ADDIE process. Note that only the first three stages were actually completed for EDIT 6210. A short implementation is conducted toward the end of the semester but only for the specific purpose of conducting a formative evaluation. Formative evaluation is better considered as part of the development step, however, because its purpose is to inform the development before full-scale implementation. It is full-scale implementation and summative evaluation that the final two stages of ADDIE refer to. The total number of weeks in Table 4 is greater than the 15 weeks of the semester, because during several weeks there was an overlap as the team moved from one stage to the next. Even with the overlap, however, it is interesting that the development stage took less time than the design stage.

The first 5 weeks of the semester were spent on the analysis phase of the ADDIE process. The primary tasks during this phase were focused on the analysis documentation. The next 6 weeks of the semester were focused on the design phase of the process. This entailed work in both instructional and graphic/multimedia design, and was the longest phase of the process. The final 5 weeks were spent on the development phase of the project, and most of this time was spent building the product in the authoring tools.

There is Lots of Design in Analysis and Development

The ADDIE breakdown of the first three phases – analysis, design, and development – is in some ways misleading, because ADDIE is overall a model of instructional design, and there is design involved in all three phases. Another way to view the ADD phases of the process is by dividing the three phases into two -- the first half being instructional design, the second half

Table 4

Weeks Spent on Each Step of the ADDIE Model

Step	*Weeks*[a]	*Dates*
Analysis	5	19-Aug-04 to 20-Sep-04
Design	6	20-Sep-04 to 04-Nov-04
Development	5	04-Nov-04 to 09-Dec-04
Implementation[b]	–	
Evaluation[b]	–	

[a]The total number of weeks is greater than the 15 weeks of the semester, because of the overlap of steps.

[b]A short implementation was completed for the class as well as a formative evaluation, however, the implementation stage in ADDIE actually refers to full-scale implementation, with the evaluation being a summative evaluation. Therefore these stages were not considered in this breakdown.

being graphic/multimedia design. An analysis phase is the beginning of any design process, and the analysis completed by the Sonic Design team was primarily focused on the instructional design, although graphic design was touched upon as well, because they had to account for the limited ability of the students to use a mouse-driven computer interface, because of the special needs of the students – something that became clear during the learner analysis. The design phase was design in the sense of both instructional and graphic/multimedia design, and this phase could be broken up evenly between the two. The instructional design ended, for the most part, with this design phase of the ADDIE process, but the graphic/multimedia design continued throughout the development phase, and it would be very difficult to parse out design work from development work in this phase – they were so closely intertwined.

It is also possible to look at the breakdown a third way. In some ways, because ADDIE is an instructional design model, it can be said that the design phase of ADDIE is strictly the instructional design, and that all other design work is done during what ADDIE labels the development phase. These other types of design would include graphic design, multimedia design, interface design, and software design (programming).

Time and Scheduling

Time Constraints

One of the key findings that were seen during this study was how much the time constraints of the course and the semester played into the design of the project. Although it could be argued that time constraints are common in any sort of classroom or work environment, and that the actual design-team work environment that forms the basis for the Studio has even tighter

time constraints, the unique nature of the Studio does mean that these time constraints are important nevertheless.

Time is particularly constraining in the Studio because of the short time of the semester (15 weeks) combined with the all the other responsibilities that the students have during the semester. These responsibilities include (a) other requirements for their Studio class, (b) other classes the students are taking during the semester, (c) graduate assistant responsibilities, (d) all other personal commitments. All but (a) are outside the scope of my research, but the amount of time they take away from the actual work on the project is real and has to be taken into account.

Class Requirements Outside of the Primary Artifact

The design of the Studio attempts to mimic a real-world work environment, and the design of the EDIT 6210 course in which the members of the Sonic Team were enrolled is the closest to such an environment. However, it should not be forgotten that EDIT 6210 is a class with traditional class requirements. These requirements include:

- Attending and participating during all class meetings
- Maintaining a professional web site that was begun in the first Studio course (EDIT 6190)
- Giving four written critiques, or desk crits, to other students
- Taking and passing a 30-minute oral comprehensive examination on topics covered in the Studio and other classes
- Completing 10 hours of community or professional service outside of the Studio

- Selecting the winners of the Blue Sock Awards, an award given to the creators of the EDIT 6190 and EDIT 6200 projects that the EDIT 6210 students believe are exemplary

These requirements accounted for 25% of the course grade for the EDIT 6210 students, and thus required a serious commitment from the participants in the study. And in the case of two of the Sonic Design team members, Sarah and Tamieka, these commitments were increased because they were taking EDIT 6190, for the second time, during this same semester. Therefore, the service hours and desk crits were doubled. In addition, they had to create the actual project for EDIT 6190 as well as the EDIT 6210 team project.

All these requirements were completed by the members of the Sonic Design team. However, it would be a mistake to say they were completed with enthusiasm. To the members of the Sonic Design team, this work outside of the main project was seen as work that got in the way of the real work of the Studio. This non-project work was one of the factors contributing to the time constraints of the Studio. These time constraints led the students to employing several techniques for dealing with this problem.

Shortcuts

The time constraints of the 15-week semester, combined with the non-project requirements of EDIT 6210, and all the other tasks and commitments that a master's student has in a semester, led the members of the Sonic Design team to take many shortcuts in the completion of their project. These shortcuts fell into several categories: code appropriation, tracing, and the reuse of prior work.

Code appropriation. The reuse of code from other Studio projects, whether their own or other students', and the reuse of code found on the Internet and in tutorial books was a common means of taking shortcuts to finish projects in the short time of the semester. Reusing publicly available code is a common practice for programmers, and it has become even more common with the rise of the Internet and the concurrent rise of the more accessible development environments, such as web-page editors and Macromedia Flash, that have fueled the rapid growth of the Internet. These more accessible development tools have allowed people with no training in computer science to design and develop applications and web sites for the Internet. To assist in this spread of computer programming to non-programmers, many web sites have appeared to supply developers with solutions to common problems. Macromedia Flash, one of the primary tools used in the Studio, has a large online community that posts code and sample applications to the Internet specifically so other developers can download these examples and integrate them into their projects. A good example of such a web resource for Macromedia Flash is FlashKit (www.flashkit.com), which posts tutorials, code samples, and whole applications – all freely available for use by other Flash developers.

An example of code appropriation in the Sonic Design team's project came when Jing wanted to have leaves blowing across the screen on the Weather Channel. Adding the blowing leaves was not vital to the instructional content of the module, but it was a nice touch that Jing wanted to add to match up with Tamieka's original design for the Weather Channel. Creating the appearance of randomly blowing leaves is a difficult task in Macromedia Flash, but Jing was able to find code to do this on FlashKit. This code was freely available, and it was exactly what Jing

needed. After integrating this appropriated code into the project, Jing then had a problem where the leaves were blowing outside the frame she had set for the edge of the Flash screen. To solve the problem, Sarah pointed Jing to one of the EDIT 6190 projects, where a student had used JavaScript to resize the web browser window so it was only as large as the frame of the Flash screen. Once Jing incorporated this JavaScript code into the project, the leaves were still blowing off the edge of the Flash screen, but they weren't seen by a user because this extra space was hidden by the edges of the web browser window.

Use of code in this way is generally encouraged by the instructors, as long as it is used for just part of the project. (Of course, if a student were to take a complete project and present it as the student's own, this would be plagiarism, but this is not what is being done here. Only small parts of a project are being borrowed from elsewhere. For example, a student may borrow the code necessary to create a drop-down menu and integrate that code into their otherwise original project.) For the Studio, this appropriation of code is also considered acceptable because the main objective of the courses is to create learning environments not simply to learn how to program. In a computer-science class, where the assignment might be to solve a programming problem, borrowing code in this manner may very well be considered plagiarism.

Tracing. On the graphic design side, the notion of code appropriation found itself best exemplified in the use of clip art from the web, from a Microsoft Office product, or from one of the design programs used by the students (all of which is freely and legally available for use in this way). An extreme example of this was practiced by Tamieka during the creation of this project. For the main cartoon characters in their project, Tamieka, whose graphic design and

drawing skills was considerable, would trace characters from cartoon-show web sites in an effort to save time. The characters used in this project were taken from the Nickelodeon cable television site. Her process for this would be to take a screenshot from the web site or download the actual web graphic, bring the graphic into Macromedia Fireworks, and then use the Fireworks drawing tools to trace over the graphic. This gave her the general outline, pose, and proportions of the character, which she could then modify to make the character unique to their web site. Even though this technique was used to save time, it was both creatively and technically innovative, and it yielded some interesting results that made the graphics fit their particular need while, at the same time, saving time and allowing the project to be finished within the short time frame. This technique was similar in some ways to the animation technique of rotoscoping, where an animator draws an animated figure over actual filmed footage of real actors.

Prior work. In the same vein as reusing code, there is a lot of cultural capital that is passed down from semester to semester in the form of all the documentation that has to be completed for the 6210 projects. The Sonic Design team took much of the form, but not the content, for their documentation from projects that had come previously. For example, while putting together their analysis documentation for their instructional design, they followed the heading-level breakdown of the team on which they had consulted on during EDIT 6200. When they had to hand in their screen layouts to David Noah, the EDIT 6210 instructor, they looked at this same team's work to see what that team had handed in, to make sure they were submitting the document in the correct format. No plagiarism was occurring here. The team's instructional

design was unique in content and audience, so the work was original. It was only the form of the documents that was being passed down from a previous generation of Studio students.

Selective Focus. As with any class, students are going to make decisions on what are the most important assignments to complete for the class. These are focused on most closely by the students, whereas others are given less attention. One big shortcut taken by the team is that they did not really do an evaluation. They did create a plan, but there was no implementation of that plan. They did do usability testing with expert reviewers (their consultants). Their documentation shows this omission, and they did not try to fake the data.

The Beginning Versus the End

The teams' attitude toward time constraints at the beginning and end of the project were very different. At the beginning of the project Tamieka expressed the idea that "anything goes," any idea was worthy of considering and anything was possible. As the project continued and time constraints got tighter and tighter and the deadline loomed, this attitude changed to one of "it just has to work." Time constraint was one reason for this, but there were other reasons as well.

Personality came into play with this attitude as well. Earlier in the process, Tamieka was largely in charge of the process, and her attitude is often one of considering any idea. The description from Sarah of Tamieka seeing design ideas in her dreams is a telling one here. Later, as the process moved to one of development of the design ideas, and Jing working in Flash became the primary focus of the teams' work, the "it just has to work" idea dominated. Jing was much more focused on implementing the ideas that had already been decided on, and was often

very nervous about her ability to implement all of it in Flash. Since she was busy enough implementing what was already designed, she was not open to any new ideas.

But it was not just personality that affected this "it just has to work" attitude, the job each team member took also affected this attitude. As the lead graphic design, Tamieka's job was to create new ideas on how things could look and how it could work. As the lead programmer, Jing's job was to get everything to work, not to think of new things that could be included in the project. As the project manager, Sarah did a great job of deferring to whichever team member was the primary lead at every part of the process. So in the beginning, she was happy to brainstorm new ideas, and allow Tamieka to go off on tangents. Toward the end, she usually sided with Jing, trusting that Jing knew what she could and could not complete by the project deadline.

As the project moved through the semester, the team also began to trim back their ambitions for the project. Again, at the beginning, anything went and the ideas came fast and were large. As the reality of finishing the project crept up on them, the size of the project was scaled back several times in an effort to finish things ups.

Tamieka's midway observations on time constraints while working with Jing is telling:

> … it's a situation of now when we talk, it's not so creative like, it's like "Dan you have enough time to do this?" you know (laughs). It's more realistic, you know, so when we talk, I'll say, "Well, yeah, I *could* do it, but...." Like last night we were talking, and she [Jing] said, "Yeah, I could probably make it so it goes like this." And I said, "Yeah, but you know, right now, we have to re-record the audio [so] is

> it OK if we don't?" She said, "Yeah." And I said, "Dan it make more work for you if we do?... you could do it, but will it take a long time?" And she was like "It'll take a long time." So I said, "Let's put that to the back." So that's like our little common joke now, let's make that to the end, you know. So Sarah said, after December or whatever,… if we have time, we can do all this stuff. So we're having this running list that's kind of growing, you know. (Interview, 12-Nov-04)

Nothing about the Sonic Design team's work in the Studio can be discussed without first discussing the limited time span in which the team had to complete their project. The goal of the final Studio project is twofold: a) to give the students the experience of working on a real design team, b) to give the team the chance to work on a real project for a real client. Of course, both of these goals and the resultant experiences are approximations of an actual real-world event. The team is often self-created by the team members themselves, often of friends, which does not match with the real-world creation of teams from employees who are chosen for skills by often-absent supervisors of people who often do not know each other initially or may never become friends.

Ownership

Throughout the semester, there seemed to be a tension between individual ownership of artifacts in the process and team ownership of the artifacts. Everyone had their key areas of responsibility, and these roles generally corresponded with the areas of the project where they felt the most individual ownership.

A good example of this can be seen in Tamieka's discussion of the workflow of her graphic design work into Jing's programming and development work. Here, she is speaking about how the Flash file that Jing was creating did not exactly follow her design lead:

> I think my biggest issue is when you have it done perfectly in Fireworks, you know, or your graphics kind of program and then you bring it into Flash, it does some really weird things: the alignments get off, and that's my biggest ... and I find myself being really critical of the alignment because I knew how it looked when it was in Fireworks and it doesn't look like that. So, I think that's my biggest thing, but we're trying to get it back to being aligned right, so I'm not going to dwell too much on it. (Interview, 12-Nov-04)

This team functioned well, though, so when it came to reasons for this, Tamieka concentrated on the technical issues on copying and pasting information from Fireworks to Flash. But the tension, and the sense of ownership of Tamieka for the design was very evident.

Tamieka ended up changing her design process and attitude during the course of the development, realizing that some things were just going to be beyond her control and she needed to let them go:

> … I'm thinking less of – everything is not perfect anymore. Like, it's OK that my tree kind of goes over a little bit (laughs), because that's not really important, you know, … the main thing is does it function. You know, it looks good, but it doesn't matter that a point may be a little bit … farther than what it should. Or

> my coins may not line up just right (laughs), you know; that doesn't matter … (Interview, 12-Nov-04)

Tamieka clarified these ideas on things getting messed up once they leave your hands when she spoke of trying to get Jing to pass off some of the development work to one of the consultants (Dan):

> because, like I told her [Jing], we can give our consultants a lot more. We can give Dan a lot of stuff. You know, if we give him the graphics and tell him how we want it done, and let him go on his way, he can do it…. And I haven't got a definite "Yes, give him the stuff." And I understand because, like, when I gave them my graphics for the people (laughs), I didn't want to. You know what I'm saying. And it was weird, because I ended up totally redoing all the bodies again (laughs), because it just didn't fit for me. But ... I understand where she's coming from with the program, because I'm the same way with the graphics. So,… it's not that you don't trust that they can do it, but you know how you have it. And you know, when you bring in someone else's files or it's done differently or in different formats and it just – I think it takes more time to fix what they have then it does to recreate something different. (Interview, 12-Nov-04)

So here, we see a strong sense of ownership combined with a realization of the tight development schedule of the Studio.

Identity

The third research question in this study focuses on student identity. As outlined in the literature review, Wenger (1998) connects identity creation to the overall theory of communities of practice. Within the context of learning, Wenger (1998) see identity as "a way of talking about how learning changes who we are and creates histories of becoming in the context of our communities" (p. 5). He breaks down identity into several characteristics: (a) identity as negotiated experience, (b) identity as community membership, (c) identity as learning trajectory, (d) identity as nexus of membership; and (e) identity as relation between the local and the global (p. 150). This framework will guide this section of the analysis.

Originally, I had thought to look specifically at the identity of students as designers in the Studio. However, after data collection and further reading, it occurred to me that identity formation and assumption is more complex, with overlapping identities that come with the students into the Studio, have been formed in the master's program and earlier in the Studio, and are being formed throughout the course of the Studio.

The primary identities of the Sonic Design team members that I identified were (a) identity as designer, (b) identity as Sonic Design team members, (c) identity as students, (d) identity as peer masters, and (e) identity as teachers.

Identity as Designers

One of the primary identities that the students in the Sonic Design team displayed, and one of my primary foci, was their identities as designers. This makes sense in a field that includes instructional design as one of its main components, but identity as a designer was spread over

several design domains, including (a) graphic and multimedia design, (b) software design, and (c) instructional design.

If we make Wenger's (1998) connection between identity and practice, that is identity forms within the boundaries of practice undertaken within and by the community, than the practice, and the skills that are displayed within this practice, by those who identified themselves as designers was the most valued and important identities that could be assumed by students in the Studio. In many ways, the ultimate purpose of Studio was to make students identify themselves as designers in one (or more than one) of the following areas.

As Instructional Designers

Instructional design, the systematic design of instruction according to one of many well-proven models such as ADDIE or the Dick and Carey (1996) model, is one of the foundations of the field of instructional technology. Therefore, at first glance, it seems only natural that identity formation as instructional designers would be common in the Studio, and in many ways it is. However, it is not a universal formation, which speaks to the fragmented nature of the field and of the department at UGA. For example, the department has or has had several focus areas for the master's program: instructional design and development, school and library media, and teaching and technology integration. Only for the instructional design and development focus is instructional design the primary focus, yet students from these other foci often take the Studio courses.

Among the members of the Sonic Design team, it was Sarah and Jing who took the primary responsibility for instructional design on the project, because a large project like this

required team members to specialize. However, during brainstorming sessions and through email all three gave input to the instructional design of the project.

It can be safely said that none of the team members became instructional designers during the course of EDIT 6210. They all held some belief in their identify as instructional designers at the very beginning of the class, and during initial interviews, all three members of the team identified themselves to some extent as instructional designers, and all three were able take part in the practice of instructional design. However, this identity was stronger in some. For example, in my first interview, I asked Jing whether she would call herself an instructional designer. Her answer showed her tentative nature (much of this because of uncertainties over her English-language skills):

> Uh … I'd like to [think of myself as an instructional designer], but I think the language is very important for the instructional designer, because they will go through all the content and make them, um, use it effectively by the user. *I'm trying to be an instructional designer* [emphasis hers]. (Interview, 26-Aug-04)

Tamieka also mentioned instructional design in her initial interview, although it came last in the list of ways she would market herself once she graduated from the program: "[as] a multimedia designer/developer. And I do a lot of graphic design and instructional design too. And web design as well. So I guess it is all three: instructional, graphic, and web" (Interview, 26-Aug-04)

So their identity as instructional designers was formed before taking this course in the Studio, although where this actually happened is hard to say. Their identity as designers was most

likely formed during the initial instructional design course that most students take in their first or second semester of the program, but it may not have happened until the skills learned in the instructional design course where applied to an actual project in the second Studio course, EDIT 6200, where students design and develop an instructional project on their own.

As Graphic and Multimedia Designers

I combine graphic and multimedia design in this study because they are generally the same thing in that they involve the creation of pictorial elements to organize content, but the web contains far more than just static text and pictures, and things like Flash animations and QuickTime movies move the idea of graphic design more into the realm of multimedia design. Additionally, interface design, which involves the creation of the menu items, buttons, and other navigational devices on a web site or computer-based application are put into this category.

In terms of skill sets used in the practice of the Studio, it is graphic and multimedia design, which is probably the most used and most highly regarded skills for participants in the Studio. My experiences during my time as a student, and my observations during the semester of my study, lead me to state that these skills are even more highly valued and used more often than instructional design skills. This is because the Studio requires much development work; that is, a lot of time building the projects, which generally takes more time than the instructional design phase of a project. Also, it is the look and feel of a project, the graphic design of it, which is going to catch people's attention. Wisdom may tell us not to judge a book by its cover, but if the cover is enticing we are more likely to check it out in the first place. It has been my experience as a student in the Studio that good graphic design is often more likely to get your project noticed

than solid instructional design. This experience has been confirmed by my observation of Studio projects during my visits to Studio Showcases after leaving the Studio and during my time as a teaching assistant for the course. The most valued projects are those that look impressive, and occasionally a project with well designed instruction but poor graphic design has been overlooked by the other students and visitors to the Studio. However, after a semester of teaching, I observed that good instructional design is rewarded by instructors, even if it is the graphic design that is often called out in class. Thus, there appears to be a misrepresentation of the importance of visual design over instructional design on the part of the students enrolled in the Studio.

As graphic and multimedia design are highly valued skills, those who come to identify with the label graphic designer, and those who are seen by their peers as graphic designers, are highly regarded members of the Studio community. All of the members of the Sonic Design team acknowledged their skills in graphic design on a computer, and they all had experience doing such tasks in their previous Studio classes and in work outside the Studio. Jing, in my initial interview, was very tentative, saying that she "maybe [did] graphic and web design" (Interview, 26-Aug-04), but she did not call herself a graphic designer.

However, it was only Tamieka who actually framed her primary identity, and was seen by other students in the Studio, as a graphic designer. From the initial interview with Tamieka, she identified herself as a graphic designer: "Yeah. I do [identify as a designer]. I tell them I'm a designer-slash-developer now" (Interview, 26-Aug-04). Tamieka had been doing art and graphic

design since she was in high school, but coming into the program, she would not have identified herself as such:

> No. No. [I would not have identified myself as a designer coming into the program.] And it's weird because I do a lot of volunteer work, and it wasn't until I revamped my resume that I saw I had a lot of web design experience. And I had to have an HR specialist tell me. She was like a friend too, and she looked at my old resume, and I had like a lot of support positions. Like, you know, you look at my resume, you would have thought I was administration support with some library experience, you know. And that was a hard basket or whatever to get out of, and I had to revamp my entire resume. And then when I saw all the work I had done, I was like I can actually be a designer now, you know (laughs)? But that wasn't until this summer. You know? I think that's when it hit. This summer. (Interview, 26-Aug-04)

So this transformation from someone who did web and graphic design to considering herself a designer only happened in the summer immediately before the semester of my data collection, and it only happened before the final semester of Tamieka's graduate program, a program in which she had long been considered an excellent graphic designer by her fellow students. The beginnings of this identification were there, but she "needed to recognize it, and own it I guess" (Interview, 26-Aug-06). From my observations, I would say that Tamieka was probably one of the most highly regarded graphic designers the Studio has seen.

As with the team members' identification with the term instructional designer, Tamieka was someone who came into the master's program confident in her ability to create computer-based art and conduct the practice of graphic design. This identity had been recognized by her peers from her first Studio class and by the time of the EDIT 6210 class in which the Sonic Design team worked, her reputation as a computer-based graphic designer was solid and her reputation for creative work was strong.

As Software Designers

Lloyd Rieber, one of the founders of the Studio, has said that the master's program in instructional design and development is not "comp sci lite," an indicator to potential students that instructional technology is more about the instruction than the technology. However, that does not mean that there is not a computer-science component to the master's program, although it is by far the most uncommon of the skill sets and identities evident in this designer category. Many students do have a sort of "comp sci lite" ability, where they can do some simply web scripting (e.g., JavaScript, simply ASP or PHP) or ActionScript programming, but true programmers are hard to find in the Studio.

That being said, the Sonic Design team had two members, Jing and Sarah, who had undergraduate degrees in computer science and who both self-identified as computer programmers. Computer programming, despite the lack of design in its name, is as much of a design discipline as instructional or graphic design. Again, as with graphic design, real computer programmers come into the program already as computer programmers, and it is not something that develops during the course of the Studio.

Even so, "programming" was a practice that was often cited by students as something they were doing. However, from an external perspective, this "programming" often meant developing animations and applications in Macromedia Flash, which is more akin to web scripting than actual programming. Even Jing, who was the primary programmer for the Sonic Design team, did all of her work for the project in Flash ActionScript, even though she was well versed in Java and C programming.

Identity as Sonic Design Team Members

The participants in this study had dual identities that sat on the nexus between expert and novice. On the expert side, they were the principal designers (or "principals," a term often used in the design world for those whose "names are on the door") of the Sonic Design team and were fully in charge of their work and their time. On the novice side, they were still students in EDIT 6210, and had to deal with the teacher-student hierarchy of power that is present in all classroom environments. This put the students in an interesting position, because on the one hand, they were in charge, and on the other, they were not.

The Sonic Design team took their positions as the principals of their "company" quite seriously, and their relationship with their client and the work they completed for him reflected this seriousness and sense of purpose. This seriousness was also reflected in how their client dealt with them, which was as more knowledgeable colleagues and expert developers.

Their identity as the principals was readily apparent in their self-identification as well as their practice as members of the team from the very beginning of the semester. The three team members usually sat next to each other during class meetings with the larger Studio. They met

outside of class on a regular basis, and were in constant email contact with each other. In many ways, they were inseparable during class time, and often outside of class.

Identity as Students

The participants' identities as students were, in many ways, traditional for a regular, graduate-level class. They were given a level of autonomy that is normal for graduate classes, while at the same time, they were expected to conform to the requirements of the class. Different from traditional classes, however, was the tension that existed between their identity as students and their identity as principals of the Sonic Design team. In the Studio, in general, it is not rare to see a moment where students, who have been working hard on their projects all semester, are suddenly scrambling to finish up the course requirements, either because they forgot about them, due to the complexity of the Studio syllabus, or due to their immersion in their own projects, or due to their procrastination on the Studio requirements because they were busily working away on their projects.

Identity as Peer Masters

The notion of peer master is perhaps the most interesting identity aspect of the Studio environment. I use the term "peer master" to identify those veterans students of the Studio who take on an almost instructor role in the class, and are the key contacts for other, new students needing certain information. Sarah, Tamieka, and Jing were all identified by their fellow students as peer masters, and they all took their role as student leaders seriously.

The idea of senior students being the primary source of information for certain aspects of the Studio has a long-standing tradition in the Studio, and it has, over the years, become an

"official" part of the Studio experience. The instructors go so far as having students list their proficiencies on the course web site, so other students can look through the list for students who might be able to help them with a specific problem. Early on, this sharing of cultural capital was deemed necessary by the instructors, because it was impossible for the instructors to know every aspect of every program and application that a Studio student could possibly need help with.

Identity as Teachers

As is common with master's level graduate populations, many of the students entering the master's of instructional technology program are working teachers who go to school in the evening. Therefore, it is not surprising that many of the students in the Studio identify themselves as teachers. Instructional technology is a bit different from other education fields, however, in that the training that goes on in the program is not specifically geared toward classroom-based teaching. Much of what the field does, and what students are trained to do, is the outside-of-class design and development of educational tools that are often designed to be used in non-traditional learning environments. These environments can be anything from student-directed homework done on a computer or over the Internet to online courses designed to be done completely outside of a classroom to informal learning that is initiated and completed independently by the learner to online corporate training that is done independent of any face-to-face course. So students in the Studio are often planning on assuming instructional designer positions or school district technology or learning support or coordination positions rather than going back into the classroom that they may be working in while they are taking graduate classes.

Therefore, the identity of teacher is neither as widespread nor as highly valued as it might be in some other graduate programs where classroom-based instruction is the primary focus. Of the three participants in the Sonic Design team, only Sarah self-identified as a teacher, an identity that was formed both in her previous career, where she taught computer-skill classes at a technology training center, and through her time as a teaching assistant in EDIT 2000. As with other identities, her identity as a teacher was not something that developed during the course of EDIT 6210 or even during the whole run of the Studio, rather it was something she brought into the program, as well as developed it concurrently but externally to the Studio.

Chapter Summary

The data for this study were analyzed using a community-of-practice framework. Three questions were posed:

1. How do theories of communities of practice explicate the way students engage in and negotiate design of an authentic design project within a team-based context?
2. How is the way in which students conduct design within a team-based context influenced by the design-studio model?
3. How do students come to identity themselves as members of the culture of designers in the design team, in the Studio, and in the larger cultures of instructional and multimedia designers? Where and how is value assigned within this culture?

Question 1 examined how the Studio model fit into the communities of practice framework, a theoretical foundation that emerged at approximately the same time as the Studio,

and so was not one of the theoretical foundations upon which the Studio was based. Despite this, the Studio fits well into Wenger's (1998) details on how a community-of-practice–based learning environment should be based. Within this framework, special attention was paid to the duality of designed and emergent community development in the Studio and how aspects of both helped form the community of the Studio.

This investigation into communities of practice uncovered the place of peer masters within the Studio. Peer Masters are those students who are so good at the skills valued in the Studio that they are seen by the newer students as replacements for the instructors, when the instructors are not available for help. These peer masters differ from other expert students because they hold knowledge and skills that, often, the instructors themselves do not possess.

Also within this question, I looked at the culture of critique that existed within the Studio, how this differs from traditional design-studio models in other fields such as architecture, and how it has both improved upon and come up short against these other models.

Question 2 examined how the way in which students conducted design within a team-based context was affected by the design-studio model. This question examined how what tasks the Sonic Design team spent their time on, and how these tasks aligned with the ADDIE model. The question also looked at how the class requirements outside of the team project impacted the design of the project, and the time and focus the students were able to bring to the team project.

It also examined the shortcuts the design team took to get their project done in the limited amount of time of the Studio, using techniques labeled code appropriation, tracing, use of prior work as templates, and selective focus. It also examined how the design process differed at

the beginning of the process versus the end of the project. Finally, it looked at the nature of students' ownership of their design and the work they completed on the project.

Question 3 examined the different identities that students both brought into the Studio and developed in the Studio because of the learning that happened in the course. It classified these identities as identity as designers, identity as Sonic Design team members, identity as students, identity as peer masters, and identity as teachers.

The next chapter, Chapter 6, discusses the implications and conclusions of these findings. In addition, recommendations for future research are addressed.

CHAPTER SIX

CONCLUSIONS

This study examined the culture of student designers in the design studio of the instructional design and development master's program at the University of Georgia. The following research questions helped frame the examination of the Studio learning environment:

1. How do theories of communities of practice explicate the way students engage in and negotiate design of an authentic design project within a team-based context?
2. How is the way in which students conduct design within a team-based context influenced by the design-studio model?
3. How do students come to identity themselves as members of the culture of designers in the design team, in the Studio, and in the larger cultures of instructional and multimedia designers? Where and how is value assigned within this culture?

Using data collected through participant observation, interviews, and the collection of design artifacts, I conducted a thematic analysis framed by Wolcott's (1994) division of qualitative data transformation into three stages – description, analysis, and interpretation. Chapter 4 of this study presented the narrative of the Sonic Design team's time in the Studio. Chapter 5 presented my combined analysis and interpretation of the collected data. In this final

chapter, I describe some further implications of this study for the future of the design-studio model of education as well as directions for future research.

Future Implementation of the Studio Model

Fostering Community

This study illustrated a correspondence between Wenger's (1998) theories of community of practice – where community cannot be designed, only planned for – and the overall planning of the Studio over the course of its existence. My observations have shown that the Studio community has been best fostered through planning by the instructors that leads to community emerging from the students themselves. The original SIGs, the mingling of students during open lab and class times, the crossover of ideas created through completing desk crits, and other optional workshops all build the Studio community with very little direct input from the instructors. The more direct methods of community creation have had mixed results at best. Some, such as mandatory attendance for the first 8 weeks and the class requirement to form EDIT 6210 design teams, worked relatively well, despite some grumbling about attendance. Others, such as the mandatory design seminar, were less successful and quickly put to rest. But student-centered or student-driven ways of fostering the Studio community would perhaps be even more helpful. Several findings in my study point toward possibilities.

The recognition in this study of the role played by those expert students I labeled "peer masters" points to one possibility for enhancing community. Increasing the role of these peer masters play could be a good start toward putting community creation in the hands of the students. Perhaps, an official or semi-official recognition of their expertise would make more

students seek them out for assistance. I can envision these peer masters taking over the organization and implementation of the SIGs as part of their expanded duties. Perhaps SIG creation could become a possible project that peer masters can undertake in EDIT 6200 or in another, yet unnamed, Studio class.

In any case, the SIGs seem an excellent place to expand the Studio community. Making SIGs the responsibility of peer master is one way to use them, but expanding the SIGs themselves to include both a seminar and an ongoing discussion and reading group could also help build the student community. Perhaps even tying in similar student projects under the umbrella of a SIG would help this. For example, all the students working on educational games could meet weekly in a gaming SIG, where ideas relevant to that specific genre of product could be discussed.

Looking at the architecture model, where students have a permanent Studio space that is theirs for the semester and available at all hours of the day and night, could also help foster community. The mandatory attendance policy implemented in this semester did seem to get the newer students to work together in the lab during class times. Imagine how far this could be taken if the students had the opportunity to work together on other nights of the week.

Fostering Identity Formation

As per Wenger (1998), this fostering of community is all geared toward getting learners to identify themselves as practicing members of the community. So how do we get students to take on the identity of an instructional designer? Speaking with Dr. Robert Branch, the head of the instructional technology department at the time of this study, I asked him what I called a "loaded question": Does our master's program train instructional designers? He answered quickly, "It

could," and then noted how this could be done by taking a certain sequence of classes and engaging in a certain type of internship (R. Branch, personal communication, April 12, 2004). So, if we are not necessarily training instructional designers, what are we doing? Are we simply training instructional technologists or educational technologists – whatever that is, as asked by Jenkins and Rossett (2000). But looking closely, Dr. Branch was correct, we are not training only instructional designers; we train technology integration professionals, multimedia developers, and/or media specialists. This problem of definition leads to a listing of all possibilities as to what we could be as shown by Rossett (2000):

> We are instructional designers, educational technologists, new media producers, Web learning professionals, school media specialists, performance consultants, performance technologists, learning technologists, Web training managers, training managers, performance support specialists, educational specialists, distance learning managers.... (p. 32)

I believe this problem of definition as regards our profession is connected to another problem of definition, that of design. Rossett (2000) noted that we are "In the midst of the confusion about identity" (p. 32). If we are confused about our identity as instructional designers/technologists, which is the core of our field, then it would explain how we are even more confused about our identity as "designers" of other sorts, such as web, graphic, or multimedia.

Jenkins and Rossett (2000) reviewed the mission statements of four top programs in our field (p. 53), and they noted that all programs foreground the soft technology side of

instructional technology – the identification and solving of instructional problems, the application of systematic processes – rather than the hard technology side of the field – the machines themselves. Yet, according to Jenkins and Rossett (2000), the marketplace has a much heavier "hard technology" picture of the field and what they wanted to hire our graduates to do. Some of our own researchers have this same opinion. For example, De Vaney and Butler (1996) note that it has been the machines and the invention of newer machines – the technology – that has been the major impetus for our field over its history. In my own program, this is not quite as clear at Jenkins and Rossett (2000) describe it. According to Dr. Thomas Reeves (personal communication, 28-Sep-06), a professor in the department, doctoral students from the department are generally hired primarily for their teaching skills/experience and their potential to be successful researchers as evidenced by grants and publications, and the department's Instructional Design and Development Master's students are generally hired for their instructional design and writing skills. My own experience backs this up: As I made the transition from the master's to the doctoral program, I was told that my development and technology skills would not be the focus of my doctoral program, and for the most part that has been true. Yet, a friend of mine received an academic position upon finishing his doctorate where his technology skills were valued above many other "soft" technology skills that he possesses.

In the Studio, perhaps different program strands – instructional designer, instructional developer, web specialist – could focus students onto specific career paths they could follow. Or perhaps, the SIGs could be set up to foster students on these specific paths.

Fostering Design

One comment that kept coming up in my talks with the Sonic Design team was the desire for more design training in the Studio. Implementing design education beyond instructional design seems like a needed update to the Studio model. Being an instructional technology department, instructional design education is fully covered, but opportunities for other types of design, such as graphic and multimedia design, could easily be added to the curriculum. Taking graphic design as an example, currently, the only graphic design education the Studio students are given comes from my occasional graphic design SIG, which is only a 3-hour seminar. Perhaps a graphic design curriculum could be integrated into the first Studio class, EDIT 6190, or perhaps an online graphic/multimedia design course could be added as a new first class, where the students could learn and practice design before they ever get their hands on the tools they will later use for their instructional development.

Fostering a Culture of Critique

One of the major deviations of the Studio model from the architecture model is the use of student-driven desk crits in place of instructor-led design crits. As discussed in Chapter 5, this creates a more student-friendly and humane studio experience, as the architecture-style design critiques led by the instructor in front of the whole class are a tense and sometimes humiliating affair for students. However, the use of student desk crits without formalized ongoing critique from the instructors in the Studio does reduce the level of rigor, and there sometimes exists an attitude in which anything is good enough. The EDIT 6200 On the Board sessions, which are led by an instructor in front of the whole EDIT 6200 class, are a step toward reintroducing the rigor

of the traditional studio model, but it too (in my experience as a Studio instructor) is lacking rigor by still leaving the primary critiquing role to the other students. My findings from this study illustrate that students are aware of the lack of rigor in the Studio, and they themselves know what is good and what is not, so a more rigorous instructor-led critique process would be welcome by many of the students. Perhaps even going back to a (hopefully friendlier) instructor-led critique in front of students as is used in architecture education would be a welcome move.

Implication of Time Constraints

The quality of the Sonic Design team's project followed a bell curve to a point. The initial module, the Money Channel, was the roughest of the three. The team was just getting started, and once their work became more refined, there was no time to go back and fix earlier work. The second module, the Weather Channel, was more refined, because of the lessons learned on the first module, and because it closely followed the model set in the first. The third module, My Community, was even more refined in some ways, but it was considerably different from the model of the first two modules and so had new elements that did not have the benefit of their previous experience. Additionally, you can tell it was the last part they worked on, and it had a rushed feel to it. There was only so much time, and this was on a well-managed project that seemed of a very manageable size when started.

Lloyd Rieber made a comment during the end-of-class Showcase about the limited shelf life of the project, and his comment can be applied to most Studio projects. The contracted projects get finished and are passed to the clients, but there is little possibility of the client being able to modify or add to the product once the developers have graduated. This too seems

connected with the limited time of the semester. To design something that is well documented and modular enough to change over time is beyond the ability of the students over the course of a single semester. In the case of the Sonic Design team, the programming of the modules was so complicated and jury-rigged that Dan, the EDIT 6200 consultant with the most Flash experience, could make sense of it. In the end, the cool features of the product are what everyone is going to see. No one sees well-documented and organized code that is easily adaptable to future changes. Given the limited amount of time involved, students opt for the cool features.

Lack of time seems the factor for so many things. Thinking back to the quality of the modules, the fast development cycle meant that Tamieka had to design the Money Channel and pass it to Jing to program before any work was done on the later modules. Therefore, all the design improvements that occurred during the design of the second and third modules could not be retrofitted to the first. For example, the line quality of the traced art was much stronger on the Weather and Community Channels than on the Money Channel. Perhaps more time to allow a full design before development work would alleviate such problems. Perhaps more training in multimedia design project management would help. Perhaps more money would be needed to purchase the media resources for such a project. Or perhaps it is just time, and more of it would make everything better. But in the end, the project was completed. Things could have been done differently, more could have been done, but in the end, the team was proud of their work, the client was happy, and the students did well in the course.

Implications for Future Research

In many ways, this study was an exploratory study into the nature of the Studio. Because of this, there are many future research ideas that can grow out of this study. A direct follow-up to this study would take the form of a scaled-up ethnographic study with a team of researchers who can observe the entire Studio at one time instead of just the small group I was able to observe by myself. A observation of the full Studio, perhaps over a period of several years where key students could be followed all the way through, would be the ideal method for getting a complete picture of the culture of the Studio.

However, because this was largely a descriptive study, my next foray into the Studio will probably be from a design-research approach (design here should not be confused with the design process that would be studied). Through this approach, I would hope to implement some of the teaching recommendations that arose from this study – rigorous critiques and community builders, for example. According to Reeves, Herrington, and Oliver (2005), a design-research approach allows a focus on complex problems, of which a design process is an ideal example (cf. "wicked problem," Rittel & Webber, 1973). A design-research approach also works well when the goal is to "refine innovative learning environments" (Reeves et al., 2005, p. 103). This is an ideal approach for implementing and testing new methods into the design-studio environment.

The design studio presents an effective and innovative way for students to engage in learning design, both in instructional technology and in more traditional fields such as architecture. Future studies should investigate if this model of learning can be expanded to teach subjects that are not traditionally thought of as design subjects, but which could be reframed

through a design-based lens. For example, could the Studio be used to teach science or math education if we view these subjects as the design of science-based education or the design of math-based education? Could qualitative research methods be taught at the graduate level if we view it as the design of qualitative research?

Another area of future research on the Studio would be to look at how well the design-studio model adapts to teach non-traditional students. The architectural design studio is traditionally populated by undergraduate students who are able to devote large amounts of time to being present in the design studio and to their work. Even the students observed in this study, despite being graduate students and despite Jing and Sarah being married and Jing having a young son, were full-time graduate students who could devote large amounts of time to the course. This is not always the case in the IT Studio, where many of the students are full-time K–12 teachers and part-time students. These students have a much harder time devoting themselves to the Studio than the students described in this study. More research on how the design-studio model could be adapted to better accommodate these part-time students, and their tight schedules and other responsibilities, would be a major step in expanding the use of the model.

Finally, this study touched upon the differences between what is formally learned in the Studio classroom and what is informally learned by the students as they interact with other students and with external resources, such as the Internet. A more detailed exploration of the formal versus the informal learning that occurs in the Studio would help us better understand how we can foster student learning in such an environment.

Final Thoughts

My final reaction to the Sonic Design team's project remained the same as my initial reaction: I was and am impressed. From an organizational standpoint, Sarah's management of the team, and the team's development performance was of a high caliber – truly one of the best managed teams I have ever seen in my 7 years of being connected to the Studio. Even so, as with all teams, they had to press hard at the end to complete the project, which may say more about the limited time of a single semester than about any organizational flaw in the team.

Besides Sarah's project management, the other team members were also impressive. Tamieka's eye for design was very good, although like many designers who learned graphic design on a computer (myself included), her drawing ability was underdeveloped, and it showed in her falling back on using and tracing clipart and other images (although the creativity in this tracing process was itself a major achievement; no one else in the Studio ever came up with such an elegant solution to the lack of original art). Likewise, Jing's programming and development work was expertly done. She worked in a manner that was completely different than the way I would have done it, but she got the job done.

The project, the actual product, that the team developed was first rate for a Studio project. I add this last caveat because all Studio projects (and I include my own), even the best ones, seem to lack the finished quality that you would get from a professionally designed (and compensated for) product. The Studio is an authentic environment as far as a class goes, probably the most authentic I have come across, but it is still a class. Most Studio projects I have seen, including that

of the Sonic Design team, have a prototype look to them. Again, there is only so much that can be accomplished in a single semester.

My time in the company of these designers in the Sonic Design team was a fruitful endeavor on many levels. On a personal level, I received great satisfaction from embedding myself into the classroom lives of my participants, and I truly felt like I was a part of the team. The friendships I made during this time continue to this day. On a professional level, this study reinforced my desire to teach and innovate in this area of education in any future position I might hold. On a research level, my inquiry into peer masters, the tension between designed and emergent community, and students identification as designers all point toward future research that I intend to pursue.

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APPENDIX A

DATA COLLECTION SCHEDULE/TIME-EVENT MATRIX

A D D MONTH	DATE	MEETING/EVENT	CLASS REQUIREMENT	TEAM PLANNED SCHEDULE	TEAM ACTUAL SCHEDULE	ACTIVITIES	DATA OUTSIDE TAMS	DATA IN TAMS
AUGUST								
Week 1	08/19/04 THU	Class 1					6th Floor Aderhold Map PSD; 616 Aderhold Map AI; EDIT 6190 Instructional Model AD SWF; EDIT 6190 Orientation AD PPT; Studio Orientation AD PPT; EDIT 6190 Reading List AD RTF; Studio Handbook Fall 2004 AD PDF	Before Class Meeting With Dawn FN; Studio Briefing FN; EDIT 6210 Breakout Session FN; Emails AD
	08/21/04 SAT							Research Journal Entry
	08/22/04 SUN	Work Meeting					Web Site Snapshot AD	Work Meeting FN
	8/25/04	First Client Meeting (Athens)						
Week 2	08/26/04 THU	Class 2				WEEK Secured Client; Picked ISD Model	Project Management Seminar Room Layout GRAFFLE	Studio Briefing and Q&A Session FN; Project Management Seminar FN; Interview #1 with Li Interview #1 with Sherita; 15-5 AD #1
	08/28/04 SAT							Research Journal Entry
	08/29/04 SUN	Work Meeting				Client goals; Components of Needs Analysis; Weekly tasks; Created surveys for Needs Analysis (see 09/07)	Client PPT Examples AD PPT; Client Top Goals for Project AD RTF; Client Ideas for Project AD PDF; EDIT 6210 Deadlines AD PDF; Work Meeting Agenda AD PDF; Web Site Snapshot AD	Work Meeting FN
	08/30/04 MON							Fall 2003 Interview with Dawn; Interview #1 with Dawn
SEPTEMBER								
	09/01/04 WED	Work Meeting (Absent)					Work Meeting Agenda AD PDF	
Week 3	09/02/04 THU	Class 3				WEEK Created, sent, and received back surveys for Needs Analysis (see 09/07); Worked on Needs Analysis DAY 1st meeting with consultants Consultant roles assigned		Studio Briefing FN; Team Meeting FN; Emails AD; 15-5 AD #2
	09/07/04 TUE	Client Meeting (Hartwell)				Sherita, Li,& I attend; Needs Analysis Sign-Off	Needs Assessment AD RTF	Client Meeting FN
	09/08/04 WED	Work Meeting (Absent)			Needs Assessment		Meeting Agenda AD RTF	

A D D MONTH	DATE	MEETING/EVENT	CLASS REQUIREMENT	TEAM PLANNED SCHEDULE	TEAM ACTUAL SCHEDULE	ACTIVITIES	DATA OUTSIDE TAMS	DATA IN TAMS
Week 4	09/09/04 THU	Class 4	Needs Assessment			WEEK Decided on what they will be creating (multimedia CD with 3 modules); Confirmed instructional goals; Determined objectives; Started on task analysis (Dawn on learner analysis; Sherita on treatment rationale; Li on HW/SW specs) DAY 2nd meeting with consultants (Brainstorming on theme);	Web Site Snapshot AD	Studio Briefing FN; Team Meeting FN; After Meeting FN; Emails AD; 15-5 AD #3
	09/13/04 MON	Work Meeting			Objectives Task Analysis		Objectives AD RTF; Task Analysis AD RTF; Timeline for Client AD RTF; IT Studio Web Site Snapshot AD	
	09/14/04 TUE			Objectives Task Analysis				My Bracketing Interview
Week 5	09/16/04 THU	Class 5 (Cancelled because of Hurrican Ivan)	Objectives Content/Task Analysis			WEEK Objectives sign-off; Task Analysis sign-off; Learner Profile, Treatment Plan, and HW/SW Specs finished; Sherita & Li working on screen designs; Dawn working on Eval Plan; "working hard to finish the design phase" (15-5 #4) DAY No class because of Hurricane Ivan	Web Site Snapshot AD	Emails AD; 15-5 AD #4
	09/17/04 FRI			Learner Profile Computer Specs Treatment				Research Journal Entry
	09/20/04 MON	Work Meeting		Project Timeline	Learner Profile Computer Specs Treatment Project Timeline		Meeting Agenda AD PDF; Treatment Rationale AD RTF	Work Meeting FN; Research Journal Entry

A D D MONTH	DATE	MEETING/EVENT	CLASS REQUIREMENT	TEAM PLANNED SCHEDULE	TEAM ACTUAL SCHEDULE	ACTIVITIES	DATA OUTSIDE TAMS	DATA IN TAMS
Week 6	09/23/04 THU	Class 6	Project Timeline		Screen Design	WEEK "ready to begin the development stage" (15-5 #5); Learner Profile sign-off; Treatment Plan sign-off; HW/SW Specs sign-off; Decided on TV/Remote motif with hosts for each channel DAY Design Seminar; No class meeting (consultants had on-the-boards session)		Studio Briefing FN; Emails AD; 15-5 AD #5
	09/26/04 SUN	Work Meeting (absent)						
	09/28/04 TUE	Work Meeting		Screen Design			Meeting Agenda AD PDF	Work Meeting FN
	09/29/04 WED	Client Meeting (Absent) Showed early flows to client				Showed client screen designs; Talked about flow of modules; Client agreed to be animated for intro (Li's idea);		
Week 7	09/30/04 THU	Class 7		Money Flowchart[a] Evaluation Plan		DAY Design Seminar; 3rd meeting with consultants; Sherita showed screens for feedback; John & Erin assigned sections of Eval Plan; Consultants showed their projects for feedback		Studio Briefing FN; Team Meeting FN; Emails AD; 15-5 AD #6
OCTOBER								
	10/02/04 SAT	Work Meeting			Evaluation Plan	Created money storyboards; Created weather storyboards; Created flowcharts too; Finished Eval Plan and sent to client;	Work Meeting Photos PDF; Early Storyboards AD PPT	Work Meeting FN
Week 8	10/07/04 THU	Class 8 (Absent)	Learner Profile Treatment Rationale and Description Hardware/Software Specs Screen Design Specs Formative Eval Plan	Weather Flowchart[a]		WEEK Sherita & Li created a list of specific graphics for money and weather channel for Will and Paul to search for; DAY Design Seminar; 4th meeting with consultants; Li showed flowcharts; Sherita showed storyboards; Got feedback		Emails AD; 15-5 AD #7
	10/12/04 TUE	Work Meeting		(a) Team later made all flowcharts & storyboards due by end of this meeting			Web Site Snapshot AD	Work Meeting FN

A D D MONTH	DATE	MEETING/EVENT	CLASS REQUIREMENT	TEAM PLANNED SCHEDULE	TEAM ACTUAL SCHEDULE	ACTIVITIES	DATA OUTSIDE TAMS	DATA IN TAMS
	10/14/04 THU	Class 9		Community Flowchart[a]	Storyboards and Flowcharts (Money, Weather, Community)	WEEK Finished community storyboards; Sherita & Li started to develop money channel; DAY 5th meeting with consultants and 1st with 6190 students attending (5); Team displayed work and progress		Studio Briefing FN; Team Meeting FN; Emails AD; 15-5 AD #8
Week 9								
	10/17/04 SUN	Work Meeting				Met for 5 hours; Sherita worked on money channel design; Sherita & Dawn worked on creating the graphics for money channel; Li moved everything into Flash; John & Paul (consultants) worked on creating bodies for characters; "majority of the first module completed" (15-5 #9)	Meeting Files Folder AD	Work Meeting FN
	10/21/04 THU	Class 10 (Absent – AECT)				WEEK See 10/17 meeting DAY I was absent, was there a meeting?		Emails AD; 15-5 AD #9
Week 10								
	10/25/04 MON							Interview #2 with Li
	10/26/04 TUE							Interview #2 with Dawn
Fall Break Week	10/28/04 THU	No Class (UGA Fall Break)				WEEK Team takes a break		15-5 AD #10
NOVEMBER								
	11/04/04 THU	Class 11	Flowchart Format Sheets Storyboards	Money Module	Flowchart Format Sheets Storyboards	WEEK Li's son recorded money channel audio; Sherita started on weather graphics; Li is moving weather into Flash; Dawn is beginning Eval (planning on separate evals for each module)	Money Module from Li AD	Work Meeting FN; Emails AD; 15-5 AD #11
Week 11								
	11/6/04 SAT	Work Meeting (Absent because of illness)						
	11/11/04 THU	Class 12		Weather Module		WEEK Money completed finished and ready for eval; Sherita done with weather graphics and moving to community graphics; Li will be adding animation to weather backgrounds;	Li's Folder AD; Web Site Snapshot AD	Work Meeting FN; Emails AD; 15-5 AD #12
Week 12								

A D D MONTH	DATE	MEETING/EVENT	CLASS REQUIREMENT	TEAM PLANNED SCHEDULE	TEAM ACTUAL SCHEDULE	ACTIVITIES	DATA OUTSIDE TAMS	DATA IN TAMS
	11/12/04 FRI							Interview #2 with Sherita
	11/17/04 WED	Work Meeting						Work Meeting FN
Week 13	11/18/04 THU	Class 13 (Dress Rehearsal)		Community Module	Money Module Draft (audio but no game)	WEEK Still developing; Sherita created client cartoon; DAY Rehearsal "went really well" (15-5 #13);	Money Channel Draft AD SWF;Sonic Design AD PPT;Sonic Design Lessons Learned AD PPT	Dress Rehearsal FN; Emails AD; My Notes and Thoughts FN; 15-5 AD #13
	11/20/04 SAT	Work Meeting				Recorded weather audio (Sherita's nephew); Li put graphics and audio for weather into Flash; Will worked on remote control	Weather Channel Script AD PDF	Work Meeting FN; Notes to Self FN
	11/22/04 MON			Start Evaluation				
Thanksgiving Week	11/25/04 THU	No Class (UGA Thanksgiving Break)				WEEK Money channel evaluated; Weather graphics into Flash; Community graphics developed;		
	11/28/04 SUN	Work Meeting						Work Meeting FN
DECEMBER								
Week 14	12/02/04 THU	Class 14		Evaluation Report Project Log User Manual Project Extension	Evaluation Report Project Log User Manual Project Extension	WEEK Client came to lab in past week to record voice; Sherita finishing community graphics; Dawn recording weather audio; Li putting final touches on weather		Emails AD; 15-5 AD #14
	12/5/04 SUN	Work Meeting					Li's Folder AD	Background on Sheri FN; Work Meeting FN
	12/06/04 MON	Work Meeting					Whole Product as of Today AD SWF; Dawn's 6210 Folder AD	Work Meeting FN
	12/08/04 WED						Whole Product the night before showcase AD SWF	
Week 15	12/09/04 THU	Class 15 (Showcase)	Evaluation Reports Project Log User Manual Project Extension		Money Module Weather Module Community Module	DAY Showcase!	Showcase Program AD PDF	Showcase FN; Blue Sock Selection FN; Emails AD; 15-5 AD #15
POST-SEMESTER								
	12/16/04							Emails AD
	01/09/05						Web Site Snapshot AD	
	02/25/05							Final Group Interview
	03/28/05							Consultant Interview
	04/20/05							Emails Next Semester AD

APPENDIX B

HANDBOOK FOR THE STUDIO EXPERIENCE

Handbook for the Studio Experience

Master of Education Degree
Instructional Design & Development (IDD)

Department of Educational Psychology & Instructional Technology

The University of Georgia

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Fall Semester 2004

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While every effort has been made to ensure accuracy and clarity of the information in this handbook, it is likely that we missed a few things. Therefore, this handbook is subject to revision as errors or inconsistencies arise. Corrected copies can be downloaded from the EDIT Studio Web Site:

http://it.coe.uga.edu/studio

Handbook version: August 19, 2004

Table of Contents

Handbook for the Studio Experience

Part One

Introduction and Purpose

The purpose of this handbook is to describe the goals, requirements, and procedures of three courses collectively called "the studio experience." This handbook, along with any materials distributed on the first night of classes, constitute the syllabus for each studio course. An important resource for the studio experience is the EDIT Studio web site. You should get acquainted with this web site as soon as possible:

http://it.coe.uga.edu/studio

The studio experience is comprised of three courses consisting of 9 credits (described in more detail below). The concept of the studio is a physical location, similar to that found in schools of architecture and art, in which students spend considerable time first learning the "tools of the trade" followed by applying these tools in creative ways to design projects individually and in groups. The studio experience will almost certainly be unlike all of your other university experiences. Instead of one group of people meeting a certain time each class to cover material identified by an instructor, the studio experience expects students and faculty to collaborate in the design and development of authentic and meaningful multimedia projects. No one studio course functions in isolation. Consequently, students in the studio will be collaborating and cooperating in ways that resemble that of professional development teams.

The Studio Approach

While the course-based model is the long-standing approach to graduate education, it is often problematic for departments, such as ours, in which students must master design knowledge and the set of tools needed to bring designs to life. For example, our students must master principles and procedures in the design, development, and evaluation of instruction. They also must master a wide range of technological skills (most of which are computer-based) in a short amount of time and then successfully apply these skills to their instructional design projects. However, one significant problem instructors and students have long faced is how to adequately teach and learn computer-based tools so as to appropriately apply them in an instructional design project within the scope of a 16-week course. Frequently, students are just beginning to master the tools when the course draws to a close. Instructional design as it is authentically applied in education and training does not lend itself easily to 16 week blocks of time. To address this problem, we have designed the studio experience based on a constructivist perspective. While it is difficult to adequately summarize this perspective here, it is based on several core ideas: 1) learning is an active process in which meaning is constructed by each individual; 2) learning is a social activity founded on collaboration and mutual respect of different viewpoints; 3) learning is embedded in the building of artifacts that are shared and critiqued by one's peers.

Table 1 lists the core principles upon which the studio curriculum is based. The studio courses provide an environment for participants to explore design (instructional and otherwise) given the capabilities of today's multimedia tools. The design concepts and development skills nurtured in the studio go beyond any particular context. Instead, you begin the studio curriculum with the opportunity to explore design issues of personal importance while you build your skill base with multimedia development tools. As you progress in the studio, you will be expected to apply your skills and understanding about design to instructional problems individually and in groups. It is expected that participants come to the studio with a wealth of experience, knowledge, and motivations. For a satisfying and rewarding studio experience, you should look to build on what you know while at the same be willing to learn from your peers. As any professional, you are expected to understand and apply the field's literature to your own work. It is important to know what has preceded your inquiry into these issues and also to examine critically the ideas and evidence presented in the literature. Evaluation in the studio is based on what you (or your team) can do and how you represent yourself in meetings and discussions, both formal and informal. Furthermore, evaluation is based on reactions from members of your immediate professional community, not just the studio faculty. Indeed, you are advised to focus on professional

benchmarks, such as a faculty member's willingness to write a letter of recommendation, much more than grades as you progress through the studio. Finally, you need to consider yourself a representative of a field and university dedicated to improving the quality of life for all people through education. Consequently, service to our respective communities is part of the studio mission.

Table 1. Studio Core Principles

1. Learning about design (especially the design of user interactions)
2. Personally relevant and meaningful experiences for those who participate
3. Appropriate experiences for all educational settings (e.g. corporate, K-12, higher education, etc.)
4. Skill development within authentic contexts (individual and team projects)
5. Collaboration & Cooperation
6. Mentoring (within and among all studio participants and faculty)
7. Understanding the literature (select → organize → integrate)
8. Performance-based Evaluation
9. Public Service

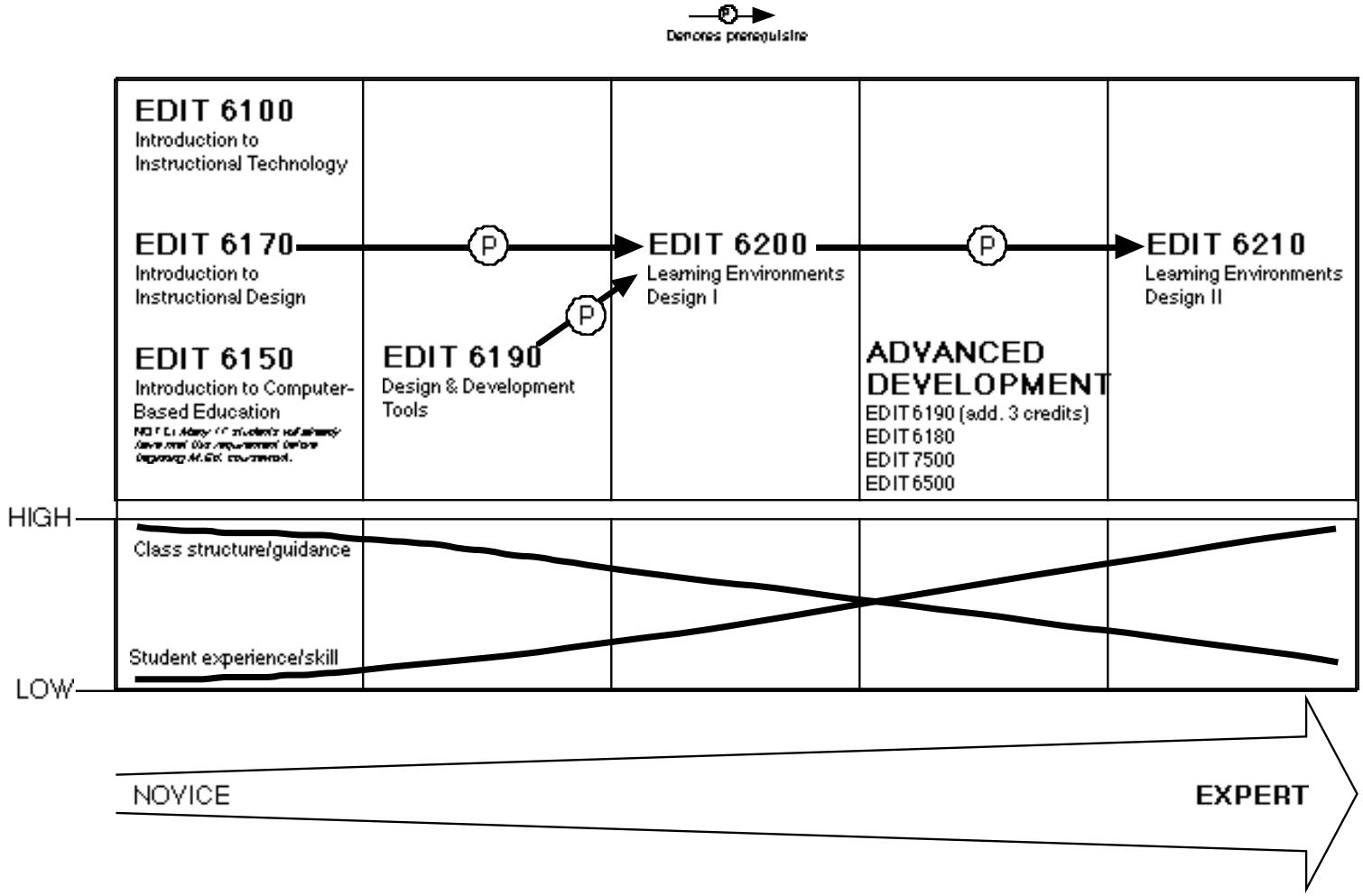
All of the studio information and procedures you will encounter in the rest of this handbook are related to these core principles. It is helpful to revisit these from time to time as you get into the "nitty gritty" of your particular studio course to remind yourself of what we are trying to achieve here.

In order to accomplish these goals, a significant part of the M.Ed. coursework takes place in a space where we can create and nurture a culture of learning. We call this space “The Studio” and it is both a physical and a virtual location with students working in the Aderhold computer lab as well as working at home, at the office or other location, and accessing resources.

Getting Ready for the Studio Experience

The studio experience requires a very different role for students than is commonly expected in a traditional instructor-led model. Students are expected to take much more responsibility for managing their time and project involvement than in most graduate courses. The studio curriculum resembles the scaffolding approach to learning. Just as a construction worker uses a scaffold to support the building of a complex structure, such as a stone archway, and then removes the scaffold once the structure can stand on its own, so too would a teacher provide additional support to learning in its earlier stages only to gradually remove these supports as a student gains expertise. Several courses in our M.Ed. curriculum are intended to provide this structure and guidance before a student begins the studio experience. For example, all students are required to have completed EDIT 6170 before enrolling in either EDIT 6200 or EDIT 6210. It is also recommended that students either new to computing or educational applications of computers take EDIT 6150 (Introduction to Computer-Based Education) before enrolling in EDIT 6190. Both EDIT 6170 and EDIT 6150 provide much structure and guidance in acquiring introductory skills and experiences necessary in the studio experience. Figure 1 illustrates the studio experience course structure and the philosophy on which it rests.

Figure 1. The Studio Experience Course Structure & Philosophy



You should not feel that you are left on your own when you participate in the studio experience. However, the way in which instruction will be delivered and learning facilitated will be quite different than you have probably experienced up to this point. For example, the learning of many computer tools will largely be accomplished by going through tutorials and software manuals at your own pace and subsequently by consulting with other students and faculty already acquainted with the tools. It is likely that various "user groups" will be established during the semester comprised of individuals all learning a particular tool (e.g. Dreamweaver, Flash, Fireworks, iMovie, etc.). In addition, many workshops and seminars will be offered to provide help and guidance during the studio experience. Workshops focus on skill development with tools whereas seminars focus on ideas, techniques, and procedures related to instructional development. These workshops and seminars will be offered as part of the planned agendas for each scheduled class session. The workshops and seminars will help provide you the skills and networking connections necessary to facilitate your learning of computer tools.

But probably the best way to learn the skills and procedures necessary to produce high quality instructional materials is through meaningful collaboration with your peers on authentic problems. It is our hope that the studio experience will allow students of varying levels of expertise and experience to work together. We also expect the studio experience to promote a "mentorship" model where students and faculty with more experience and skills can share what they know with others just starting out. It is no secret that the way many of us have learned what we know has been through helping others. It is also no secret that the road to learning has no final destination: there is always something new to be learned and experienced, even with tools and ideas with which one has years of experience.

Part Two

General Procedures of the Studio Experience

This section is meant to act as your "roadmap" to a successful and satisfying studio experience. By now, it should be clear to you that much of your experience depends on you and your peers. Faculty will facilitate and manage the studio experience, but the value that you finally derive from it depends on a large part of what you choose to devote to it. We hope you see this studio experience as a special opportunity for professional development. Figure 2 illustrates the studio course requirements and the collaborations among students.

The faculty/staff assigned to the Studio Experience this term are Lloyd Rieber, Ikseon Choi, and David Noah. These instructors will be collaborating in various ways and you should expect to interact with each regardless of which course you are enrolled in. Each instructor has been assigned to manage a specific studio course and activity. If you have a particular question or problem, you should first contact the instructor or graduate assistant assigned to that area:

Course/Activity	*Studio Manager*
EDIT 6190	Rieber
EDIT 6200	Choi
EDIT 6210	Noah
Studio Web Site	Rieber
Handbook	Rieber
Showcase	Choi

General questions should be directed to Dr. Rieber.

General Studio Scheduling

It is recognized that everyone has a busy schedule and everyone will be juggling many other demands on their time, such as jobs, other courses, and family obligations. It is vital that students manage their time very well, starting on the first day of the term. For this reason, we have scheduled all three studio classes for the same night during this semester. You should not schedule any other course for this night and it is expected that you

Figure 2. The Studio Experience Course Requirements
(with relative contribution to final grade)

	EDIT 6190 Design & Development Tools	**EDIT 6200** Learning Environments Design I	**EDIT 6210** Learning Environments Design II
Participation (Attendance, desk crits, ishowcase, course procedures)	✓ 25%	✓ 25%	✓ 25%
Service Requirement	✓ 10%	✓ 10%	✓ 10%
Individual Project	✓✓ 40% Negotiated with the studio manager; based on design principles aligned with constructionism, not those of instructional design.	✓✓ 40% Project evaluated based on instructional design principles with a strong focus on learner interaction.	Mentor students in EDIT 6190 and 6200.
EDIT 6210 Team Project	✓ Attend at least 2 meetings of EDIT 6210 Project Teams and comment on these in your reflection paper.	✓ 15% Project Consultant on one EDIT 6210 Team Project.	✓✓✓ 40% Project Team Leader on one EDIT 6210 Project.
Comprehensive Exam	Read and discuss course books/articles and find your own. Consider relationship between theory, research, and practice.		✓ *First Try:* 30 min. oral exam *Second Try:* 30 min. oral exam *Third Try:* 15 page paper
Writing Activities	✓ 25% Reflection Statements & Literature Critique	✓ 10% Individual Project Documentation & Formative Eval. Report	✓ 25% Team Project Documentation

will be available anytime between 5:00 and 10:00 p.m. for any studio related events, meetings, or other responsibilities. For example, all workshop and seminars will be conducted on this night. Likewise, all teams are expected to meet on the studio night. Whenever possible, all formal events and activities will be scheduled to conclude by 8:00 p.m. leaving the remainder of the evening for lab work, user group meetings, team meetings, and other collaborations.

The following rooms have been assigned to the Studio courses on **Thursday** nights this term:

5:00 to 10:00 p.m.: Room 616 (Computer Lab) and Room 601 (classroom)
Room 613 (classroom), Room 626 (classroom), Room 603 (meeting space)

The weekly schedule will vary during the semester, but here is the general order for studio events (if a particular kind of event is not planned for a particular day, other events will be "bumped" to an earlier time accordingly):

1. Weekly briefing (August 26-October 7; everyone meets in room 601)
2. Group discussions (based on readings)
3. Tool workshops
4. Design seminars
5. Desk crits (starting around Class 6; see later section for requirements)
6. Lab work, team meetings, user groups meetings, etc.

Attendance by all participants is mandatory from August 19-October 7, November 18, and December 9 with each class starting promptly at 5:00 p.m. Be sure to check the online calendar and read all weekly *Notes and Reminders* (emailed weekly) for more details.

Studio Orientation: A Very Important Meeting at the Start of Each Semester

The first studio activity at the start of every semester is the Studio Orientation. All students enrolled in any of the three studio courses **must** attend this important meeting (those that do not will be dropped from the course unless prior arrangements have been made). The meeting will largely be informational in nature covering topics such as the following: 1) introduction of faculty and students; 2) general studio procedures; 3) general computer lab procedures; 4) consideration of course projects and the kick-off of the "Studio Job Fair" (see next section); and 5) and general questions and answers. The Studio Orientation is also the initial means of meeting your fellow students. This is important because of the expectation that experienced studio participants will mentor or counsel less experienced participants throughout the semester. Also, the most valuable learning resource in the studio is each other.

After the Studio Orientation. As soon as the Studio Orientation concludes, you should do the following:

Access the EDIT Studio web site (http://it.coe.uga.edu/studio) and submit your profile to the EDIT Studio People database;
Arrange to have a digital picture taken (for use in your profile);
Read this Studio Handbook thoroughly;
Participate in the "Job Fair" activities; and
Plan on participating in the other studio orientation activities planned for class 2.

Special activities are planned for class 2 as a follow-up and continuation of the Studio Orientation. For example, we will start class 2 with an informal Question and Answer session hosted by the Studio faculty (with free pizza!).

Using the e-mail address you submit as part of your profile, you will be subscribed to the ITSTUDIO listserv. This list will be one of the most important means for all studio instructors and students to communicate throughout the semester. You need to check your e-mail frequently, at least once daily. It is also recommended that you check your e-mail more frequently before major studio events, such as mandatory class sessions or the Showcase, for important up-to-the-minute information. You will be emailed confirmation of your subscription to the ITSTUDIO listserv within 48 hours of the end of the Studio Orientation. If you do not receive this confirmation be sure to notify the Studio instructors because this means something has gone wrong with your subscription (and you risk not receiving important information).

Studio Job Fair for Design Projects

One of the most important outcomes of the studio orientation is the procedure related to the management of design projects. At the end of the orientation, the specifications of design projects will be presented by clients and/or team leaders or posted on the EDIT Studio web site or the ITSTUDIO listserv. Which projects get staffed, how they get staffed, and how individual students become members of a project will be handled through a set of procedures resembling a "job fair." That is, possible projects will be presented and needed positions for each of these projects will be "advertised". Consequently, individuals are encouraged to apply to several projects. By the end of the second class, all team leaders and clients will select project team members on the basis of the qualifications described in each application. It is hoped that this will result in the best project ideas getting staffed with people best suited to fill the project positions. Faculty will rarely step in to "appoint" a person to a project or rearrange members of a project and will do so only in extenuating circumstances. By the end of the second class, all project teams must be staffed and work on the project begun. Any individual student in EDIT 6200 or EDIT 6210 not part of a team by the end of the second class must make an appointment with the studio instructors.

Part Three

Requirements for all Participants of the Studio Experience

The purpose of this section is to explain the requirements of **all** participants, regardless of the particular Studio course in which a participant is enrolled. This section also describes the Comprehensive Exam. Although this exam is only taken by EDIT 6210 participants, it is explained here because one prepares for this exam throughout the studio experience and other courses taken in the Masters curriculum. This section also describes two Studio awards — the Blue Sock Award and the Allen Bullock Service to the Studio Award.

Participation

A variety of activities are graded under this heading, as listed and described below. Besides these specific activities, your attendance of all mandatory class meetings and timely and professional completion of all non-specified Studio procedures are evaluated here. For example, you are expected to read thoroughly all email as soon as it is received and complete specific course activities by the announced due dates. As shown in Figure 2, these activities are collectively worth 25% of your grade in the Studio. Obviously, it is important that you take these activities seriously and complete them on time in an appropriate manner.

Professional Web Site

Please note that you are expected to already have your own professional web site at the start of this course (this is an outcome of EDIT 6150) and to keep it up-to-date. Be sure to include the URL of your web site when you submit your profile to the EDIT Studio People database. Your web site will be reviewed within 2 days after the start of the course.

Desk Crits

As individuals and teams begin to develop course projects, it is essential to both give and get feedback. The design process generally consists of the following four stages: 1) brainstorming of possible project topics; 2) the development of project "thumbnails" (preliminary project ideas presented as crude prototypes or storyboards); 3) development of project "roughs" (rough drafts of the project as it is being developed); and 4) development of the final course project. All four stages are open to critical review and evaluation. Beginning around class 6, time will generally be set aside for special critique sessions of the project roughs. We will refer to these as "desk crits" (short for desktop critiques) to get across the idea of a couple of people giving a critique at someone's workstation. Every participant is free to solicit as much feedback as they wish from fellow students and faculty, however, each participant is **required** to highlight their work in at least **two** desk crit

sessions and also at a special "wrap-up desk crit" featuring next to last drafts of *everyone's* work several days prior to the Studio Showcase. (Note: This final desk crit session will be structured to resemble a "dress rehearsal" of the Studio Showcase.) It is also required that everyone provide critical feedback to other course participants (a sample "desk crit" feedback sheet is provided in Appendix B). Each participant is **required** to complete at least **four** desk crits of other students' work. Although we have scheduled specific opportunities for people to critique each other's work, desk crits can really take place anytime a few people are gathered together and working on Studio projects.

Studio Showcase

The culminating studio event at the end of each semester is the Studio Showcase. This is a public event at which all students enrolled in any of the studio courses present their projects and share their work. This event will be advertised throughout the university and the community. People who attend the showcase will have the opportunity to critique your work. Obviously, this showcase is meant to be taken very seriously. The intent is not to intimidate you, but rather to showcase your work and ability. The showcase will resemble a professional conference.

While this event is meant to give all students constructive feedback, it also begins the formal evaluation of each student's and each group's project. After the showcase takes place, the studio instructors will further review each project. Grades for each student will be based on the degree to which design specifications for each project have been met, depending on the course, and the student's participation in all studio experiences (such as the showcase).

Comprehensive Exam

There is a set of formal knowledge that any instructional technology professional is expected to have. Much of this formal knowledge is documented in the readings. This information will be discussed and applied in a variety of ways. Even though students are not evaluated in the studio experience with formal tests, it is critical that each student be personally accountable for demonstrating competency with the professional literature. Consequently, only M.Ed. student enrolled in **EDIT 6210** will be required to complete a comprehensive exam in order to demonstrate their familiarity and understanding of core ideas and principles related to instructional design and development. (Note: Non-majors and Ed.S./Ph.D. students are exempted from this requirement.)

This exam will take place approximately during weeks 10-12 of the semester (the actual date and time for each candidate's exam session will be announced by about class 6). The exam will take approximately 30 minutes. The format of the exam will be oral with one or more faculty or doctoral students serving as the evaluators. During the exam, the candidate will be asked a series of questions related to any aspect of instructional technology covered in any of the course experiences taken to date. Examples include knowledge about learning theory, instructional systems design, educational media and the relationship between theory, research, and practice. You should also come prepared to summarize and discuss at least one reading (article or book) of your choice that you have personally found to be worthwhile and compelling.

Candidates who do not perform satisfactorily will be given one opportunity to retake the oral exam. Candidates who do not perform satisfactorily during the second oral exam will be required to submit a written paper on these foundational topics (approximately 15 pages in length) according to specifications outlined by the supervising faculty. This paper would be required as part of the candidate's M.Ed. portfolio and therefore due at the time the portfolio is submitted to the department.

This exam is discussed in this section because the best way to prepare for it is by taking the professional literature seriously in each class you complete. This is not an exam to "cram for," but rather is a place to demonstrate your evolving understanding of this critical set of knowledge.

Service Requirement

One requirement of all students enrolled in any studio course relates to professional service. Service to one's community is one of the guiding principles of all public institutions and is part of the mission of land grant universities (of which UGA is an example). A total of 10 hours of service is required.

Students can fulfill this requirement in a variety of ways. Students can offer their services to a school, public agency, a community group, or a UGA department. (The IT department, for example, normally runs several sections of classes for undergraduate students that often can benefit from some instructional assistance with technology tools. Contact Gretchen Thomas in 607-A, gthomas@coe.uga.edu, for more information about this need.) Students can even fulfill this requirement by helping directly in the studio experience, such as by helping with a workshop or seminar, assist in organizing the Showcase, or just spending scheduled additional time in the lab giving assistance to other students. Use the Service Log form in Appendix C to document your service activities and give a copy of the service log to your Studio manager at the end of the semester. It is important to note that this service requirement cannot be fulfilled by work done on an individual or team project (although such projects may lead to service opportunities if the client happens to be a school, public agency, or a community group), nor can you count time or work provided to for-profit groups, such as companies or corporations. Service requests from non-profit groups can also be found in the online service request database found on the Studio web site.

The experience of "giving something back" is a very satisfying feeling and is one of the reasons many of us continue to remain in public education. It also is an excellent way to extend your understanding of a computer tool or to learn more about the application of instructional technology in a real setting — ideas well aligned with a constructivist perspective.

Blue Sock Award

This award was initiated in the spring of 2002 to recognize the outstanding EDIT 6190 and 6200 projects. It is called the "Blue Sock" award after a workshop that Lloyd Rieber conducted in the fall of 2001 in which he built an interactive blue sock (for reasons you'll have to pry out of him). The procedure for the awards will be as follows:

1. A committee will be formed with one Studio faculty member and all EDIT 6210 students (this is a requirement of 6210 students and there is no service hours for your work). In the summer, the committee will be composed of 6210 student volunteers from the preceding spring or the subsequent fall.
2. The night of the Showcase, 6210 students will be required to make sure that all 6190 and 6200 projects have been seen by at least two committee members. Committee members can nominate any project for a Blue Sock award.
3. The committee will meet the day after the Showcase and examine the work of all nominations (attendance is required for all EDIT 6210 students). Those nominations that receive a majority vote of the 6210 students (faculty votes do not count) will receive the Blue Sock Award. Those nominations that fail to garner a majority vote will be recognized for having been nominated.
4. The only criteria to be applied is whether the work is exemplary and of sufficient completeness.
5. Those nominations that can be distributed via the web will also be passed on to the WWILD team (http://it.coe.uga.edu/wwild) for consideration.
6. There will not be any upper or lower limit to the number of Blue Sock awards each semester.
7. All winners, nominees, and committee members will be recorded on the Blue Sock Award page. All winners and nominees will be provided with an award graphic that they can include on their own pages to recognize their achievement.

Allen Bullock Service to the Studio Award

This award recognizes those individuals who give selfless service to their classmates in the Studio in the way of extraordinary help and support. It is named in honor of Allen Bullock, a graduate of the IT Department. Besides doing exemplary work in the Studio, Allen's classmates would constantly tell the faculty, without prompting, how much they appreciated his help and support. Allen always seemed to be there when someone needed help, critical feedback, a word of encouragement, or just someone to listen. Interestingly, Allen never felt he was doing anything out of the ordinary. Awardees, like Allen, should not think their help and support are unusual by their own standards. (Although we hope all Studio participants will aspire to win this award, it is wise to remember: "If you think you deserve it, you probably don't.") This is a noncompetitive award — it can be given out to as many people who deserve it via a peer-selection process that will be described during the term. This is a one-time award (i.e. it cannot be received multiple times).

Part Four

Computer Resources

It is difficult to imagine any professional working today without ready access to adequate computer resources. This is especially true among those working in the Instructional Technology profession given our increasing reliance on computer technology. While the department stops short of making it a requirement, it is highly recommended that students purchase their own computer along with core software applications. This is a good investment, not only for completion of your graduate studies, but also for your future as an IT professional. Faculty will be happy to discuss recommended configurations with you.

If you do not purchase your own computer and software applications, then you will necessarily be tied to the computer hardware and software resources available in the College of Education computer labs. These resources are limited both in scope and access, plus they are shared by many other groups in the college. Therefore, you will need to manage your time wisely throughout this course and will need to arrange your schedule to conform to times that the labs are open. Everyone needs to comply with the computer lab procedures and policies established and maintained by the Office of Information Technology (e.g. limited labs schedules, costs for all printing, etc.), under whose authority falls most of the hardware and software resources. Expect and plan for the following: (a) peak hours when many people will be competing for available hardware and software; and (b) the inevitable technical problems that computer hardware and software present. You need to recognize that available resources necessary to complete the studio requirements will be constantly strained.

The Studio lab is located in Room 616 Aderhold. This is a state-of-the-art facility featuring both Wintel and Macintosh computers with an assortment of multimedia hardware and software. Please note that all computers in the Aderhold labs have special management software installed which erase all files added to the machine since it was last rebooted plus the machines are programmed to erase all files added during the day (this once-a-day "cleaning" supposedly occurs in the middle of the night). Therefore, do not leave important files on any machine. You are responsible to keep the original files (and other back-ups as needed) in your possession. An access code for the 616 lab is available to EDIT Studio students. However, security issues are an ever-present concern, so if security appears to have become lax, the access code may be changed at any time. EDIT Studio students will be notified of any change via email. The inconvenience that may be caused by an access code change may be avoided by all EDIT Studio students using the existing access code in a responsible manner. More information about this will be discussed at the Studio Orientation on the first night of class.

A core of software such as Microsoft Office, Netscape Navigator, Internet Explorer, etc. has been placed on all computers in the Studio Lab. In addition, some specialized software has been installed on all the computers, including Dreamweaver MX, Flash MX, Fireworks MX, and Photoshop. iMovie has been installed on all the Macintoshes. Other specialized software is available in other labs in the college.

We also have seven other Macintosh G4 workstations dedicated to digital video applications. Two of these are located in Room 616 and five are in Room 602. More information about these specialized workstations will be shared during the term.

All of the Windows computers in the 616 lab include built-in Zip drives and floppy drives. The G4s have CD-R and DVD-R drives, but no zip or floppy drives. Everyone is encouraged to purchase a USB Mini-drive — these "key chain-like" mini-hard drives are a very convenient way to store and move data from one computer to another. This is a particularly easy way transfer files between home and school. It is recommended that you consult with a variety of faculty members and experienced students before you make a purchase (note that USB mini-drives can also be purchased from the OIT on the second floor of Aderhold).

Part Five

Requirements and Procedures for EDIT 6190 Design and Development Tools

Prerequisite: EDIT 6150 or the equivalent

Overview

This course has two main goals: 1) to master a collection of tools, most of which are computer-based, to be used throughout your participation in the Studio experience in the design and development of learning environments; and 2) to reflect and write on the nature of design. Here is a brief summary of the *unique* requirements for this course:

> Completion of an Independent Project that demonstrates mastery of authoring and multimedia tools in an original design;
> Submission of a web-based design journal consisting of a group of reflection statements to accompany the completion of the Independent Project;
> Submission of a web-based review and critique of the design literature (note: this can be integrated into the design journal);
> Attendance and written summary of two EDIT 6210 team project meetings.

In EDIT 6190, students learn a set of tools and deliver one or more projects that demonstrate their competency with these tools by the end of semester. This semester, the following tools will be taught by the instructors: Dreamweaver MX 2004, Flash MX 2004, Fireworks MX 2004, and iMovie. However, any participant who wishes to learn one or more other tools is welcome to submit a proposal listing the tools s/he wishes to learn, learning resources (such as textbooks), a time line for learning the tools, and a short rationale for each tool. The proposal will be reviewed by the instructors and, when approved, becomes a "tool learning contract" which must be completed by October 7, at which time the individual will schedule an appointment with a studio instructor for a **performance review** of their tool learning. (Participants who choose to learn the tools identified and taught by the instructors are not required to complete this individual performance review.) The projects completed by each EDIT 6190 participant will be presented and shared during the Studio Showcase.

This course will follow the project-based approach to learning tools. That is, the goal is to master a variety of tools in the context of completing a project. However, this course is somewhat unique in that students are *not* expected necessarily to develop *instructional* projects. Students may design one or more projects that satisfy their own needs and values and they will not be held accountable to instructional design criteria. The purpose of this perspective is to free the student from worrying about designing something the "right way" according to principles that they may not have had a chance to fully understand. This perspective also gives students the opportunity to design projects that they find personally engaging or valuable. Examples might include family music videos, interactive stories, multimedia biographies, and even games for entertainment.

Another goal of this course is to begin to grasp the broad nature of design, instructional and otherwise. Students are expected to complete several readings related to design. Among the most important set of readings relate to "learning by designing", a point of view known as *constructionism*. As the name implies, this perspective holds that learning is best achieved through the construction or building of an artifact that can be shared and critiqued publicly. Participants are expected to keep and maintain a design journal according to the schedule identified by the instructor as they complete their Independent Project. Participants are also expected to write a short review and critique of the design literature they read during the semester. It is recommended that this literature review and critique be integrated into the design journal, but this can also be written as a stand-alone paper.

Students enrolled in this course are also required to attend at least two team meetings of projects being completed by students in EDIT 6210. You have no responsibilities on these projects. The goal is merely to get a sense of the dynamics of team projects and to get acquainted with the expectations of these other two studio courses. Your only task is to comment on these meetings in your design journal. All team meetings will be

advertised on their respective project web pages linked to the EDIT Studio web site.

This course may be taken a second time to fulfill the Advanced Development requirement of the Instructional Design & Development track of the M.Ed. degree. Students who choose to enroll in a second EDIT 6190 experience have the additional responsibility to mentor those taking it for the first time. Among the most important responsibilities is to help first timers learn multimedia tools and help them with their individual projects through reflective conversations. Those taking EDIT 6190 for the second time should consider themselves as "counselors" to first-timers. Up to 5 hours of service credit may be earned for this requirement in *partial* recognition of the time that will be needed to perform this very important service. All "claims" for these service hours must be based on active and sustained counseling over the semester and must be confirmed by one or more participants enrolled in the studio for the first time.

Required Textbooks

Rieber, L. (2004). *Getting Up and Running with Dreamweaver MX 2004*. [Online] Available: http://www.nowhereroad.com/dreamweaver (downloadable version provided at no charge to UGA students in the Studio; directions on how to obtain this free handbook will emailed to all studio participants)

Evans, J., & Brown, C. (2004). *Macromedia Fireworks MX 2004 Zero to Hero*. Berkeley, CA: Friends of ED.

One of the following, depending if you want to emphasize learning Dreamweaver or Flash:

Kerman, Philip. (2004). *Sams Teach Yourself Macromedia Flash MX 2004 in 24 Hours*. Indianapolis, IN: Sams Publishing.

Bruce, B. (2004). *Sams Teach Yourself Dreamweaver MX 2004 in 24.* Indianapolis, IN: Sams Publishing.

Prerequisite Tools

All participants are expected to have already mastered the following computer-based tools:

Word processing
Spreadsheets
Databases
Desktop presentation applications
Web browsers & HTML editors
File Transfer Protocol

You are also expected to have an introductory proficiency with one or more hypermedia authoring tools (such as PowerPoint).

Types of Tools that Students Will Learn

Participants taking EDIT 6190 for the first time will learn tools in two categories: authoring and multimedia. It is expected that most participants will choose to learn the tools identified and taught by the studio instructors. Suggestions are made in the next few paragraphs about alternative tools that a student might contract to learn. You are also free to propose your own ideas for tools not specifically mentioned so long as you can make the case that these tools allow for authoring and multimedia development. Here we will discuss “what’s out there.” K-12 educators are encouraged to review software resources available and in use at their respective schools in making choices.

Authoring tools include programming, scripting, modeling, and project development applications. Examples include tools typically used by commercial developers (such as Flash, Authorware, and Director), design/programming/modeling applications typically found in K-12 schools (such as Inspiration, HyperStudio, PowerPoint, Microworlds Pro, StarLogo and StageCast), and even simulation and modeling tools (such as Geometer's Sketchpad, ThinkerTools, Interactive Physics, and SimCalc). Many web development applications (such as HTML editors like Dreamweaver and FrontPage) can also be considered as authoring tools. The

specific authoring tools you choose to learn should be a function of the type of user interactions you want to design and the educational environment you want to serve. Students interested in business/industry will have different needs than students interested in working in K-12 school environments. For this reason, it is useful to "declare" a focus area for your entire Studio experience. Examples of different focus areas include media developer, instructionist technology-using teacher, or constructionist technology-using teacher. A participant interested in media development will likely choose tools such as Flash, Authorware, or Dreamweaver with CourseBuilder. Teachers who focus on using technology to improve their teaching will likely choose tools such as PowerPoint or Dreamweaver. Teachers who focus on constructionist uses of technology will likely choose tools such as StageCast or Microworlds Pro. The final choice is made in consultation and negotiation with the Studio manager for EDIT 6190. Identifying a focus area will help guide your project development throughout your studio experience, not just in EDIT 6190. Regardless of whether you learn the default selection of tools or choose an alternative, it is important to keep in mind the core studio principle of learning about the design of user interaction, consistent with the focus you intend to take with your studio experience. Sufficient expertise with the authoring tool must be acquired in EDIT 6190 in order to appropriately meet the design requirements in EDIT 6200. For example, participants who focus on media development will need to be able to author judged question & answer interactions or interactions commonly found in simulations and games when they take EDIT 6200. Therefore, you need to make this one of your learning goals in EDIT 6190. Certain authoring tools afford different opportunities for interactive designs. The learning curve also varies widely from one tool to another.

Multimedia tools include graphics applications (e.g. Photoshop, Illustrator, Fireworks, FreeHand) 3-D and animation applications (e.g. 3D Studio Max, Flash), and video/audio production and editing (e.g. iMovie, QuickTime Pro, Final Cut Pro, Premiere). Teachers are reminded to consider multimedia tools commonly found in the schools for their contracts, such as Inspiration. It's important to note that some tools can be categorized as authoring or multimedia, depending on the skill level a person chooses to acquire with it. For example, one could choose to learn only Flash's drawing and animation features as a multimedia tool or choose to learn Flash ActionScripting as an authoring tool.

Mastering Curriculum Software Programs: An Alternative Approach to the Standard Tools for K-12 Educators

Besides learning the types of authoring and multimedia tools listed above, K-12 educators can also consider mastering 3-5 innovative and interactive curriculum software programs, such as those from Tom Snyder Productions (e.g. "Decisions, Decisions", "The Great Ocean Rescue", etc.). "Mastering" is defined as having attained expert status in knowledge about the program (i.e. intimate knowledge and experience of <u>all</u> sections and levels of the program) and the program's classroom uses (i.e. could be called upon to consult with other teachers about the program's use in the classroom). A minimum of 40 hours spent learning the curriculum packages needs to be logged. So, fewer packages would be chosen if they require in-depth experience to gain mastery.

Teachers who follow this approach would also be expected to complete an online reflection journal in which the literature is integrated. Likewise, they would also be required to submit an independent project based on their knowledge of the curriculum packages they mastered. The design and substance of the project is made in consultation with the respective Studio manager. One important criterion is that the project must be suitable for display at the Studio Showcase.

Required Reading

A collection of readings from a variety of sources will be used as the required reading for EDIT 6190. Some of these are articles from books or journals and others are web-based. Some readings will be required by all participants in EDIT 6190, but you will also have the flexibility to choose some readings that best match your needs and interests. The list of readings can be found in Appendix C.

Requirements

Independent Project

No later than mid-semester, each participant begins work on her or his independent project. This is completed using a contract that is web-based and is updated continuously over the remainder of the term. Your project is always subject to review and evaluation as it is being developed. You should seek "desk crits" of your project throughout the term. A "next to last" draft of your Independent project must be completed in time for the "showcase dress rehearsal" with final modifications made in time to display the project in its final form at the Studio Showcase at the end of the term.

Project Options. A participant can choose several options for selecting the topics and formats for their independent projects. **First**, you can produce something that is personally relevant and meaningful — it does *not* have to be instructional, nor must it follow instructional design procedures. This is the constructionist approach. **Second**, you can produce something for someone else who is not in the Studio. If your work requires you to develop multimedia, you can build it using the tools you are learning in 6190. Of course, you will have to satisfy the expectation of this person or group. **Third**, you can participate in a 6210 project and contribute to the project (not recommended for those enrolled in EDIT 6190 the first time). **Finally**, you can negotiate something else with the Studio faculty if you have a different idea. Obviously, you can demonstrate proficiency with all the tools you have learned by integrating elements into a single artifact. You may also want to have separate artifacts. A program, a gallery of digital images, and a digital video clip that stands alone might be another alternative.

Web-based Contract and Design Journal. You are required to create, maintain, and make regular entries in a web-based contract and design journal that documents your 6190 design experience. Although you are expected to have the skills necessary to create your own design journal pages online, we have provided templates to assist you with this task. Identifying what is an acceptable independent project is accomplished through negotiation with the Studio manager through the use of the web-based contract. Here are step-by-step procedures for completing the web-based contract and design journal. (These steps are also listed on the web, embedded in a copy of a contract template that you are encouraged to use. Not surprising, the following steps are easier to understand by reviewing them in the web-based form).

Step 1a: Read these handbook pages carefully and ask your Studio manager for clarification if you have questions. It's a good idea to review some exemplary examples of web-based contracts from previous semesters.

Step 2a: Construct a contract web site. A template for this web site is available for downloading off the Studio Web Site (go to the "contracts" link). It is highly recommended that you use this template. Not only will this free you from the unnecessary burden of creating this web site from scratch, it will also ensure that everyone's contracts will have consistent characteristics. You are free to adapt or customize this web site template to suit your own personal styles. (You can also create your own web site if you wish so long as it contains all of the necessary elements and facilitates the mission of the contract. However, be careful you do not waste your time unnecessarily at this stage!)

Step 2b: Write a brief project description and put it on the home page of the web contract. You only write this once, but you can (and should) revise it often as you like. This description will eventually be copied and pasted into the Showcase program. Remember that this is the first thing people will see when they come to your web-based contract. Keep this project description brief — no more than 3-5 sentences. The idea is to write a brief description or summary of your 6190 project, suitable for quick and easy reading by any visitor who comes to your web site. (If you have trouble writing this, pretend your project is finished and you marketing it. If I were a customer looking at it on a shelf in a computer store, what would you write on the box to describe what the project is all about?)

Step 3: Write a first draft of your "Independent Project Contract" and post it on the Contract side of your "first cycle". Most probably, you only have a rough idea of what you are going to do when you begin. That's understandable and we are operating under the premise that you will only be able to give more details once you

start building your project. Here's an example for a first draft contract:

> I plan on building a computer game using Authorware that gives a fun bicycle tour of Nowhere Road. The main character of the game is a 'mild-mannered UGA professor' who bikes to work every morning. I would like the game to teach something about bicycle safety.
>
> I will also construct a gallery of all my Photoshop work. Although I expect to include my best examples in the game itself, I will organize all of my work in such a way so as to show my ability to use this tool and how my proficiency with this tool evolved over time.
>
> I will create an iMovie about bicycles using copyright-free clips I find as well as some original video footage I will shoot and digitize. I'm not sure yet if it will be related to the game's theme."

Step 4: Write your first reflection statement and post it on the Reflection side of your "first cycle". Each reflection statement should be about 400 words (the average length of a 1-page double-spaced manuscript). Remember, all of these statements are your reflections, beliefs, and understanding about design situated in the development of your project. You can write these anyway you like, but your first one should probably address why you have selected the topic/s for your Independent Project and also provide an elaboration on the project ideas. Also remember that you are encouraged to integrate the design literature in as you write these. Most people will integrate their studio readings, but any relevant literature is acceptable. If you go this route, be sure to cite your references completely at the end of each reflection statement and use APA style throughout. Try to make connections between what you are doing and what design scholars have written. (If you do not integrate the literature into each and every design journal entry, you will need to write a separate "literature review & critique" paper. See Step 7 below.)

Step 5: At least once every two days, post a revised contract on the Contract side of each successive cycle and a new reflection statement on the Reflection side. Do **NOT** replace your old contracts or reflection statements — the idea is to show how your project idea evolved. Add details and elaborations as they become available.

For example, if the first contract draft included a sentence like "I am going to construct a web site about bicycle safety" you would need to give more details about the scope and depth of this web site as the project unfolded. How many pages will the web site contain? How many links? How many graphics? How will the site be organized? What special features or characteristics would the site contain? Etc. You might draw a diagram of the web site structure and include that as a GIF in a later contract. These details would be added over a period of several days.

As another example, if the first contract draft included a sentence like "I am going to construct a PhotoShop Gallery" you would need to elaborate in future contract revisions on the number of examples and what they represent. For example, some people may have over 30 or more examples in their gallery, where each represents a "before and after" image using a simple technique (such as a filter). However, others might include only 5-10 examples because of the complexity of each (i.e. each demonstrates a wide range of techniques). Also describe how you are going to present the examples -- on the web? In a PowerPoint slide show? How are you going to tell the viewer what you did (keep in mind that seeing a final product may give no clue to the steps it took to create it) — will you annotate each example? Again, these details would be added to your current contract draft over time.

Of course, if you have nothing to revise in any one of the contract entries (which is likely once or twice), then just copy and paste the previous one.

Step 6: Repeat step 5 for each remaining contract cycle.

Step 7: Write a final reflection statement. At the end of the term, when you have finished developing your project and after the showcase, write a final reflection statement that puts closure on this design experience. If you have chosen not to integrate the literature into each and every design journal entry (including this final statement), or found it difficult to do so in an appropriate manner, then you will be expected to submit a separate paper (no less than 5 pages) that includes the following: 1) summary of the literature you have read this semester in your own words describing the main concepts and principles; and 2) critique of the literature from

your point of view. You will need to construct a web page for this paper and provide a link to it from your final reflection statement.

Remember that this web-based contract and design journal is a public document, so it is important to proofread all past contract and journal entries carefully for spelling, grammar, organization, and clarity. Your reflections must focus on the design of your project (not your general studio experience) and you are expected to write these in a professional manner.

Other comments

The evolution of the Independent Project contract and the reflection statements of your design journal must provide a consistent and coherent account of your design efforts. A result of this writing process is that you will better understand your own opinions about education, training, instruction and learning, as situated in your own design efforts and substantiated by published design literature. Of course, this process also leads others to understand your point of view as well. Our hope is that you will learn a little about yourself as the result of writing and reflecting on your design process.

It is important to note that completion of your Independent Project contract requires you to create something original, that is, something beyond the step-by-step development covered in the books or resources you used to learn the tool. This original work would then be shown during the Studio Showcase at the end of the semester. **All students must provide a list of items in their showcase that map into each of the contract that you constructed.** For example, if you digitally enhanced some photographs in Photoshop to demonstrate proficiency with this tool and these photographs are embedded in a Director movie, you must note where they are and how one would find them. This will make it clear to the student and the Studio faculty as to what constitutes fulfillment of the contract.

EDIT 6190 Checklist of Requirements

Required Attendance

- ❑ Studio Orientation (class 1)
- ❑ Attendance required for all classes through October 7
- ❑ Wrap-Up Desk Crit (aka "Showcase Dress Rehearsal"; November 18)
- ❑ Studio Showcase (December 9)
- ❑ Attend at least 2 meetings of EDIT 6210 Team Meetings and provide a brief reaction to these meetings in your independent project's web-based design journal.

Independent Project

Web-based contract and design journal:

- ❑ First entry needs to be posted by Class 9
- ❑ Submit new entry once a week for a total of 8 entries
  - ❑ Design literature: either integrate the literature in some meaningful way into *each and every* journal entry, or write a separate 5-page paper (see p. 19 of the handbook for details).
- ❑ Submit final reflection

Project

- ❑ Complete project according to your contract and submit to instructor at the end of the term

Other

- ❑ Have a professional web site (however humble) posted by class 2; enter URL in your Studio class profile (these skills are prerequisite to EDIT 6190).
- ❑ Digitizing Requirement: Create a short (15 seconds) digital movie with sound (only due at the end of the term). (Most people are able to meet this requirement by successfully completing the iMovie workshop planned for about mid-semester.)
- ❑ Provide at least 4 desktop critiques ("desk crits") of other people's projects (use form on p. 34 of the handbook as a guide; keep a copy of all desk crits you provide: these can either be turned in separately to the instructor at the end of the course or posted on your web site).
- ❑ Service: Provide at least 10 hours of service to non-profit group/s. To get credit, you must enter these into the studio service database (links are in your Studio class profile edit page).
- ❑ Reflect thoughtfully on why and how you learn (no written requirement).

Part Six

Requirements and Procedures for EDIT 6200 Learning Environments Design I

Prerequisite: EDIT 6170; 3 credits of EDIT 6190

Overview

Besides the requirements listed in this section, take note that you are also responsible to meet the general requirements of all Studio participants, as listed in Part Three of this handbook.

The goal of this course is to apply the tools mastered thus far in the Studio by designing an individual project that leads to a motivational learning experience for an intended audience. All students also participate in a team project managed by participants enrolled in EDIT 6210. Two very different kinds of projects can be undertaken in EDIT 6200: 1) instructional projects in which participants apply what they know about instructional design and what they know about computer-based tools; and 2) constructionist projects in which participants facilitate the construction of multimedia projects by children, young adults or adults. The decision to pursue an instructionist or constructionist project depends in large part on your EDIT 6190 experience, your teaching/learning philosophy, and your studio focus (i.e. media developer, teacher-instructionist, teacher-constructionist). The process leading to the selection, design, development, and evaluation of this independent project (instructional and constructionist) generally consists of the following four stages:

1. Brainstorming of possible project topics and preparation of design documents;
2. The development of project "thumbnails" (preliminary project ideas presented as crude prototypes or storyboards);
3. Development of project "roughs" (rough drafts of the project as it is being developed); and
4. Development of the final course project.

All four stages are open to constructive critical review and evaluation. All students will present their independent projects for review during the Studio Showcase at the end of the semester.

Enabling your growth in team environments is another goal of this course. To facilitate this growth, you are expected to have some responsibility on a 6210 team project. However, your participation is meant to serve only a supportive role, giving assistance where appropriate (titled "project consultant"). While you are expected to attend all team meetings during weeks 3-13, you are not responsible for managing the project or ensuring that major milestones of the project are completed. Your objective should be to learn about the design process from a group of experienced students. However, it is expected that you will "lend a hand" in appropriate ways, such as by contributing ideas and completing several specific and well-defined development tasks on time and as needed by the team (such as helping to develop graphics, creating audio files or QuickTime movies, prototyping a new web page, informal field testing of materials, etc.). It is the responsibility of the EDIT 6210 team leaders to clearly define your tasks and to give you specific deadlines for their completion. However, it is your responsibility to complete these tasks on time. Other departmental projects besides those evolving out of EDIT 6210 may also be used to meet this requirement, such as departmental faculty research and development projects. However, permission by the Studio instructors must be given before participation in non-EDIT 6210 projects will be accepted.

Facilitation of your growth as a designer and developer are a key component of the 6200 experience. There are several activities designed to help you reach this goal. First, you are required to read the Alessi and Trollip book (see the calendar for due dates for chapters). To enable reflection, you will be required to submit brief chapter summaries. Each summary should address the following points:

What are the key ideas?
How do they relate to your project?
What questions do you have after reading?

Contributions to the larger community are also an important aspect of your professional growth. To that end, EDIT 6200 participants have the responsibility to mentor participants who are new to the Studio. EDIT 6200 participants should consider themselves as "mentors" to those new to the Studio and this responsibility can be met in a couple of ways. You may meet the mentoring responsibility by providing assistance to new Studio participants. Service credit may be earned for this role (up to 5 hours). All "claims" for these service hours must be based on active and sustained mentoring over the semester and must be confirmed by one or more participants enrolled in the studio for the first time.

Finally, there are four activities to assist with the management of your project. First, 6200 participants are required to participate in two or more "On the Board" meetings (refer to the calendar for dates/times). "On the Boards" are meetings designed to enable 6200 participants to share work at different points in the design and development process and to receive assistance and feedback from colleagues, peers, and the Studio manager for 6200. The first "On the Boards" meeting will occur after Week 4. Second, 6200 participants are also required to have two 30-minute individual meetings with the 6200 Studio manager. In these meetings, you are expected to introduce your initial ideas (Week 4) and prototypes (Week 8) of your projects in order to receive assistance and feedback from the Studio manager. Third, you should upload weekly project reports (15/5s) to your Project Management Site. The 15/5s (15 minutes to write, 5 minutes to read) should address the following:

What progress did you make this week?
What do you need to do in the coming week?
What assistance/resources would be helpful to reach your goals?
And other additional information that you think important.

Fourth, all 6200 students must maintain a Project Management Site. The site should contain links to all 6200 deliverables including Project Documentation (see list under Project Specifications) and the project itself.

Course Objectives and Independent Project Specifications

EDIT 6200 participants who develop an **instructional** project are expected to:

1) conduct a needs assessment, task analysis, learner analysis, and cultural and environmental analysis to determine the specifications for an interactive learning environment

2) define treatment, learning strategies, user interface, and assessment strategies for an interactive learning environment.

3) conduct formative evaluations (including rigorous usability testing) of a prototype interactive learning environment.

4) manage the personnel, temporal, and financial resources involved in the design of an interactive learning environment.

5) document the design and development processes for an interactive learning environment.

6) demonstrate expertise in a range of technical skills including graphical design, authoring, digital media production, etc.

EDIT 6200 participants who develop an **constructionist** project are expected to:

1) facilitate a multimedia project designed by a small group of children, young adults or adults.

2) document the design and development processes used by the group, such as by having each member of the group keep a reflective design journal of their experience.

3) conduct an evaluation of the learning and motivation of the group associated with the project construction.

Required Reading

The following text is required by all 6200 participants:

Alessi, S., & Trollip, S. (2001). *Multimedia for learning: Methods and development* (3rd ed.). New York: Allyn & Bacon.

You will be held responsible for the required readings and a regular schedule will be established to enable discussion of and questions related to the reading. Be sure to check the Studio calendar for more information.

Recommended Reading

The following readings are recommended for all participants in EDIT 6200:

Fiedler, S. (1999). *The Studio experience: Challenges and opportunities for self-organized learning*. Available (online): http://it.coe.uga.edu/studio/fiedler.html

Gustafson, K., & Branch, R. (1997). *Survey of instructional development models*. Syracuse, NY: ERIC Clearinghouse on Information & Technology.

Instructional Project Specifications

Participants who choose to develop an instructional project must submit an original interactive, web-based lesson. This project should reflect your design and authoring skills using web-based delivery methods. Each lesson should consist of appropriate web-based files (e.g. HTML-authored files with graphics and audio as appropriate) linked to an interactive module. An interactive module is a very short and very interactive lesson component; typical modules include games, simulations, and Q&A activities. Any authoring tool can be used so long as the resulting interactive module can be shared over the web (possible development tools include Authorware, Director, Flash, Dreamweaver with CourseBuilder, and JavaScript programming). You are expected to find and work with a client (or a group of users in your target audience) to produce an interactive web-based lesson that addresses an instructional need (teachers can use some or all of their classroom students as "clients").

The following materials must be submitted:

1) All appropriate software — HTML files, GIF or JPEG graphics, audio files, etc., and all other multimedia files (such as those developed with Authorware, Flash, StageCast, etc). Besides having all of these materials submitted for review, those who develop instructional projects are also expected to upload these files to a web server, such as ARCHES. (If you do not have an ARCHES account, go to http://www.arches.uga.edu/ and follow the instructions to get one.)

2) Instructional Project Documentation:
    1. Project Abstract (25-50 words, including the URL of the web lesson).
    2. Instructional goals and objectives
    3. Instructional content/task analysis
    4. Learner profile
    5. Summary of the lesson (250-500 words)
    6. Rationale of computer- and web-based formats as an appropriate instructional medium (100-200 words)
    7. Curriculum integration recommendations (100-200 words)
    8. Detailed flowchart of the lesson design and sample screen designs (with special emphasis on the interactive module).
    9. Cost estimation of personnel, temporal and other resources used to produce your interactive module.

Note: Elements of the project documentation will be submitted throughout the semester. Be sure to see the class schedule below (*Specific Deliverables During Semester*)

3) Weekly "15/5" project reports — The weekly "15/5" project report is meant to summarize where your client-based project stands to date. It should take no longer than 15 minutes to write and no longer than 5 minutes to read (hence the name). A new report needs to be posted to your Project Management Site no later than **8 pm on each Tuesday** throughout the semester.

Any educational content may be selected for your project. Evaluation of the project is based on the following: (a) all established design components for a tutorial format, as presented and discussed in the text and class, must be included (though you are encouraged to go beyond these if you desire); and (b) the project fulfills instructional, programming, cosmetic and curriculum adequacies (these will also be discussed in class).

Be warned that one mistake that well-intentioned participants often make is selecting too broad a topic and/or too much content to be taught (in fact, focus less on the lesson content and more on the learning process). It is highly recommended that you limit your *entire* lesson to approximately 30 minutes of *learner* time (i.e. the time it takes a typical learner in the target audience to complete the lesson). The interactive module you program should take the user approximately 10 minutes to complete. Other models that you may consider must be approved by the appropriate studio manager. For example, classroom teachers are encouraged to consider designing a WebQuest (http://edweb.sdsu.edu/webquest/webquest.html) with an interactive module. Another possibility for teachers is to design the instructional project using a participatory design model — having students act as "co-designers" of the tutorial you create (for an example of this approach, see:
http://www.ncsu.edu/meridian/archive_of_meridian/jan98/feat_1/kiddesigner.html)

Formative Evaluation Report

A central theme of this course is that computer-based or web-based instruction (CBI/WBI) cannot be designed and developed without careful attention to the user. Therefore, you are required to conduct a preliminary formative evaluation of your CBI/WBI project with at least a small group of actual users (3-5 people). (While you certainly should seek feedback from your peers, these "actual users" may *not* include people enrolled in this course.) You are required to write a brief formative evaluation report (about 1000 words) that describes the following:

(a) a profile of the learners;
(b) assessment criteria;
(c) procedures that were followed;
(d) results; and
(e) recommendations for revisions.

Assessment criteria should relate to usability issues and the degree to which predetermined learning outcomes have been met (i.e. has any learning occurred and how do you know?) This report is also due at the end of the semester, by the date announced by your studio manager.

Specific Deliverables During Semester

1. "15/5" project reports (each week, beginning in class 3)
2. Abstract, client identified, intended learner audience identified (by class 3)
3. Goals, objectives, content/task, and learner analysis (by class 5)
4. Sample Screen Designs and Flow Chart (by class 7)
5. Complete Design (by class 9)
6. Prototype meeting with the instructor (by class 10)
7. Showcase "Dress Rehearsal" (near End of Semester)
8. Formative Evaluation Report (End of Semester)
9. Showcase (End of Semester)

Constructionist Project Specifications

Participants who choose to facilitate a constructionist project are expected to find and work with a group of children or young adults and facilitate their construction of a multimedia project on a topic of shared interest. You must submit the final project or projects constructed by the group of children or young adults. Typical tools used in constructionist projects are StageCast or Microworlds Pro. However, any multimedia tool can be chosen (including Flash, Dreamweaver, and Authorware). The central idea is that the tools are used by the group you facilitate. Consult closely with your studio instructor in defining the process and tools to be used to support your project.

The following materials must be submitted:

1) All appropriate software — All multimedia files (such as those developed with StageCast, Microworlds Pro, etc).

2) Constructionist Project Documentation:
   Project Abstract (25-50 words).
   Summary of the project (250-500 words)
   Reflection journal that you keep during the semester (2000 words)

3) Weekly "15/5" project reports — The weekly "15/5" project report is meant to summarize where your client-based project stands to date. It should take no longer than 15 minutes to write and no longer than 5 minutes to read (hence the name). A new report needs to be posted to your Project Management Site no later than **8 pm each Tuesday** throughout the semester.

Specific Deliverables During Semester

1. "15/5" project reports (each week, beginning in class 3)
2. Abstract and client identified (by class 3)
3. Summary of the project, including sample goals and objectives and intended learner audience identified (by class 5)
4. Initial implementation plan (by class 7)
5. Complete implementation plan (by class 9)
6. Prototype meeting with the instructor (by class 10)
7. Showcase "Dress Rehearsal" (class 13)
8. Reflection journal (End of Semester)
9. Showcase (End of Semester)

For all 6200 projects: All projects (instructional and constructionist) are due at the start of the EDIT Studio Showcase (and web-based projects must be functional on your ARCHES account by this time)**.** Please note that all materials should be accessible online as well as submitted via CD-ROM. The computer software you submit will not be returned, but will instead be made available to future classes to review. (Examples of previous projects can be found on the EDIT Studio web site.)

(**Note**: 3 credits of EDIT 6190 are prerequisite to this course. However, if you choose to take an additional 3 credits of EDIT 6190 and happen to be taking them concurrently with EDIT 6200, then the two independent projects for each course must be **clearly** separate; no part of one project may be used for credit in the other course. Be sure to clearly distinguish these projects when they are submitted for evaluation.)

Part Seven

Requirements and Procedures for EDIT 6210 Learning Environments Design II

Prerequisite: EDIT 6200

Overview

Besides the requirements listed in this section, take note that you are also responsible to meet the general requirements of all Studio participants, as listed in Part Three of this handbook.

The overall goal of this course is refine your instructional design, development, management, and evaluation skills to as close to the professional level as possible. This goal is primarily accomplished through the process of designing a substantive interactive learning environment in a team approach and by mentoring students enrolled in EDIT 6200. This course gives students the opportunity to use their skills and experiences developed during previous coursework to design a high-quality educational multimedia product. Students are also expected to mentor students taking EDIT 6200 as they learn the processes of design, development, management, implementation, and evaluation of multimedia-based instruction.

Although the mentoring of EDIT 6200 students should be taken very seriously, it is important to note that EDIT 6200 students are not to assume any major project role or responsibility. However, they are expected to contribute to the project in helpful ways. Tasks or jobs given to EDIT 6200 team members should be carefully specified and due dates clearly indicated. The overriding principle or attitude is that EDIT 6210 team leaders should be able to complete the project without assistance and that the participation of the EDIT 6200 participants is perceived as a "value-added" aspect of the Studio Experience.

Course Objectives

At the end of the course, participants will be able to:

1) make a significant contribution as a team leader by assuming the roles of project manager, instructional designer, programmer, graphic artist/videographer, and/or evaluator within the context of a team-based interactive learning environment development project;

2) prepare clear, useful documentation for interactive learning environment development projects;

3) use design strategies such as storyboarding, flowcharting and rapid prototyping;

4) identify the pros and cons of various delivery and authoring systems for interactive learning environments;

5) identify pedagogical dimensions appropriate for interactive learning environments for education and training;

6) conduct formative evaluations of an interactive learning environment product under development;

7) design effective, aesthetically pleasing user interfaces for an interactive learning environment; and

8) within the context of a real project with a real client, apply advanced design perspectives such as:
   scaffolding within a learning environment
   interactive learning environments encouraging exploration and “play”
   open-ended learning environments that allow discovery learning
   learning by designing and building

model-based reasoning
hypertext and hypermedia
microworlds, simulations, and games
virtual learning environments
flow theory
visualization as problem-solving

Resources

Participants are expected to consult the instructional design, development, evaluation and project management literature as needed. The website for this course will include links to relevant readings and other resources to support the development of a sophisticated interactive learning environment.

Teams are also required to choose and follow a particular instructional design model at the start of the semester, such as those described in the following text:

Gustafson, K., & Branch, R. (1997). *Survey of instructional development models*. Syracuse, NY: ERIC Clearinghouse on Information & Technology.

Content

This course focuses on analysis, design, production, and evaluation processes for the development of interactive learning environments. The course content includes
:

needs assessment and task/content analysis methodologies
instructional design
project management
rapid prototyping strategies
creativity
project documentation
teamwork and work ethic
roles and responsibilities of instructional designers, programmers, graphic artists, videographers, evaluators, project managers and others involved in the development enterprise
formative evaluation of IMM products
legal issues related to copyright
future trends in IMM.

The course is intended to integrate practical experience with opportunities to learn technical and conceptual design knowledge and skills. The course provides students opportunities to collaborate in the design and production of an interactive learning environment prototype for a real client. Course assessment will focus on the creativity, effectiveness, and overall quality of the prototype product as well as the quality, utility, and comprehensiveness of the project documentation. Client satisfaction is an important assessment aspect.

Team and Individual Responsibilities

The team development of an interactive multimedia prototype is a challenging task. This task amounts to the application of project management, instructional design, programming, graphics design, video production, evaluation and other design conceptual and technical skills to transform your brilliant ideas into “reality” on the computer screen. The multimedia prototype should reach a degree of completeness at least sufficient for meaningful user/client testing. A high level of team cooperation and individual effort towards achieving team goals is expected. Team members will need to agree on the sub-tasks for which each member is responsible early in the process. A team is only as strong as its weakest link so everyone must do their share of the work.

Not all of the original design ideas your team creates must be developed to meet the requirements of this course. However, the prototype must be a distinct module or set of modules. In other words, it is not satisfactory to implement “bits and pieces” of the whole design plan and have no independent components that are functional.

Further, although there is no obligation to follow your initial design exactly, major changes do require the approval of the client.

Each team member must keep a log of his/her activities related to the project throughout the semester. Your team should create a logging system the first week of the course. An example of a Project Activities Log form can be found in the *Multimedia Development Tools* EPSS (available for downloading from Professor Reeves' web site — http://it.coe.uga.edu/~treeves/). Each activity should be classified according to one of the major functions and activities involved in the multimedia development process so that an overall tabulation of team effort can be computed using a spreadsheet program such as *Microsoft Excel*.

Formative evaluation is the "fuel" that keeps the instructional design process going, especially in a rapid prototyping environment such as the one you will experience in this course. The course instructors, clients, and other students in the course are expected to provide honest feedback to each team. This feedback will be valuable information that can guide the development of your multimedia program. Other useful formative data will be gathered from typical users of your interactive learning environment.

Prototype and Project Documentation Requirements

All computer files that constitute the prototype must be submitted in functional form on a CD-ROM or accessible via the World Wide Web. The program should be accompanied by a brief user manual describing installation procedures (if relevant) and guidelines for implementation.

Project documentation will include the following:

1. Needs Assessment Report
2. Objectives List and/or Content/Task Analysis
3. Project Time Line
4. Learner Profile
5. Treatment Rationale and Description
6. Hardware/Software Specifications
7. Screen Design Specifications
8. Formative Evaluation Plan
9. Flowchart, Format Sheets, and/or Storyboards
10. Client Sign-Off Forms
11. Formative Evaluation Report
12. Project Activity Logs Analysis
13. Installation and Implementation Documentation
14. Project Extension Proposal

Note: Elements of the project documentation will be submitted throughout the semester. Be sure to see the class schedule below (*Specific Deliverables During Semester*)

Specific Deliverables During Semester

1. Needs Assessment Report (by class 4)
2. Objectives List and/or Content/Task Analysis (by class 5)
3. Project Time Line (by class 6)
4. Learner Profile (by class 8)
5. Treatment Rationale and Description (by class 8)
6. Hardware/Software Specifications (by class 8)
7. Screen Design Specifications (by class 8)
8. Formative Evaluation Plan (by class 8)
9. Flowchart, Format Sheets, and/or Storyboards (by class 11)
10. Client Sign-Off Forms (class 4, 5, 6, 8, 11, End of Semester)
11. Formative Evaluation Report (End of Semester)
12. Project Activity Logs Analysis (End of Semester)
13. Installation and Implementation Documentation (End of Semester)

14. Project Extension Proposal (End of Semester)

Assessment Criteria (remaining 35% comes from other Studio activities)

Product Documentation (25%)
- Completeness
- Clarity
- Utility

Final Multimedia Product (40%)
- User Interface
- Aesthetics
- Creativity
- Potential for Extension
- Effectiveness
- Client Satisfaction
- Team Collaboration

Selection of Project Topics

The Studio experience is based on people working on authentic projects. The selection of projects for EDIT 6210 is therefore an important first step. Each project for this course must involve a client and consist of a team of students with varying degrees of expertise. All EDIT 6210 students are considered "team leaders" who will take on one or more of the most critical team roles, such as project manager, lead project designer, programmer, graphic designer, project evaluator, etc.

The responsibility of identifying clients and project topics rests with the students. However, faculty members continually seek external clients for potential projects. Faculty members and researchers from throughout UGA as well as external clients are encouraged to submit possible projects to the Studio website. Students are also free to make contact with a client and to suggest a project topic based on the client's needs. It is possible that some projects will continue over a period of two or more terms as interest and further development warrant. Final approval of project clients and project topics is a faculty responsibility.

Whether or not a certain topic gets chosen as an EDIT 6210 project simply depends on the project attracting sufficient participation by other EDIT 6210 and 6200 students. The organization of a viable project team is a function of the number of participants enrolled in both EDIT 6210 and 6200. The Studio manager will oversee this process and help the teams make fair assignments if necessary.

Using the "Studio Job Fair", as described earlier in this handbook, at least one team leader (in consultation with the client) should prepare a project description to be distributed during or shortly after the Showcase Orientation held during the first class. The sole purpose of this description is to solicit participation from other students in the Studio. The description can be as brief/long and as formal/informal as you wish. For example, it could resemble a job advertisement posted in a newspaper's classified section. Those written poorly simply risk not attracting any participation. These "job ads" can be posted on the EDIT Studio Home Page and on the bulletin board in Room 616.

Team Web Sites

Each project team needs to have its own web site with at least the following elements:

- Project description (50-100 words)
- Intended audience
- Instructional objectives
- Team members (roles of team leaders must be specified)
- Time and place of next scheduled team meeting
- Weekly "15/5" project reports
- Project documentation

The project description and instructional objectives will undoubtedly evolve and be refined over the term, so be sure to update these as needed. The website should include an indicated of when it was last updated.

The weekly "15/5" project report is meant to summarize where the project stands to date. It should take no longer than 15 minutes to write and no longer than 5 minutes to read (hence the name). A new report needs to be posted on the project's web site no later than **Noon each Monday** throughout the semester.

The Project Documentation portion of the site will grow overtime. As new sections are added, be sure to send an e-mail message to your Studio Manager so s/he will know they need to review your documentation.

Of course, the project web site can consist of any other additional materials that the team wishes to include, e.g., bios and resumes of the project team members.

In addition to the project web site, **each** 6210 participant is required to maintain an individual site to document the completion of other Studio requirements (e.g., service and desk crits). These individual pages should be linked from the Team Members page of the group project management page.

Project Management

The ability to manage the complex set of variables inherent in completing an educational multimedia project on time and with high standards is one of the most difficult aspects of this Studio course. For example, successful projects require team members to:

1) understand the needs of the client and intended audience;
2) understand the demands of the media and allow enough time to do adequate development;
3) carry out appropriate evaluation procedures in order to revise the project to work as intended when implemented; and
4) understand the personal goals, needs, schedules, and personalities of all the team members involved.

Project management is not something only the project manager does, but instead requires the cooperation and trust of all members of the team. Naturally, compromises must continually be made. It is the responsibility of each team member to set aside individual differences, when they arise, in order to ensure that the project's goals are met. Above all else, each member needs to remember that "with responsibility comes authority, and with authority comes responsibility." In other words, one's role on a team denotes certain responsibilities, and with that responsibility comes the authority to make decisions. In cases of dispute, the project manager should be considered as having the final authority on project matters. Each project must have one and only one project manager. The selection of the project manager is one of the most important decisions the team makes once a project topic has been identified.

In the event that a team is experiencing problems that they themselves are not able to resolve or reconcile, it is the responsibility of the project manager to notify the Studio instructors of the problem. The faculty will subsequently take whatever steps are necessary to ensure that the team overcomes the difficulty.

Process Assessment

Teams will be given written feedback in regard to their progress as observed by the studio manager. This feedback will be given around the sixth and tenth classes of the semester.

Team Meetings

Team meetings ought to take place during the scheduled class time or sometime during the regular Thursday evening sessions of the Studio. Team meetings should not overlap completely to enable the Studio manager to meet with each team. If team A is meeting from 6-7, then team B could meet from 6:30-7:30, and so on. Team project managers should coordinate their schedules with each other and the Studio manager.

Appendix A

“Desk Crit” form

Desk Crit Form

Background and Procedures

Displaying your work and getting feedback: Everyone is required to display their work, at whatever stage of development, at least three times during the semester, including at the special "wrap-up desk crit" (aka "dress rehearsal") near the end of the term. Of course, you are free to solicit as much feedback as you wish from fellow students and faculty.

Critiquing other people's work: Everyone is also required to provide others with critical feedback. This is a formal requirement that must be documented in writing. You are required to give written feedback on weak areas of a project and, hopefully, some suggestions on how to improve it. Compliments or comments such as "That's great!" or "Nice work!" do not count. (Everyone is expected to provide a minimum of 4 desk crits of <u>other</u> people's work.)

Suggestions on what to critique: The project's overall design; instructional design; consistency between instructional objectives and instructional activities; consistency with design models (i.e. events of instruction, ARCS model); project organization, appropriate use of media; aesthetics; user interface; graphic design; to name a few. (Note: EDIT 6190 projects are not necessarily instructional design projects, so consult with the designer as to the appropriate criteria.)

Your Name (person providing critique) _____

Designer's Name _____

Project Title _____

Critique

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Remember to make yourself a copy of your critique (for your own records) before giving your comments to the designer. These copies will serve as the documentation at the end of the semester showing that you fulfilled this requirement. Alternatively, you could send your comments to the designer via email, but be sure again to keep a copy for your records.

Appendix B

EDIT Studio Service Log Worksheet

EDIT Studio

Service Log Worksheet

Fall 2004

To receive credit for your service, you must submit each entry of your service log to the EDIT Studio Service Database on the Studio web site by the end of the semester.

Service activity	Service provided to…	Date	Time Spent

Notes:
- A minimum of 10 hours of service is required to satisfy service requirement.
- Presenting a 1-hour studio workshop or seminar is equivalent to 5 hours of service.
- Phone number or email address of "service providee" may be requested by Studio faculty to verify service activity.

Appendix C

EDIT 6190 Reading List

EDIT 6190 Reading List
Fall 2004

(Listed in the suggested order of reading. The readings in the first section are - or will be shortly - available online from the IT Studio website.)

Fiedler, Sebastian (1999). *The Studio Experience: Challenges and Opportunities for Self-Organized Learning.* Athens, GA: The University of Georgia, Department of Educational Psychology & Instructional Technology [On-line]. Available: http://it.coe.uga.edu/studio/fiedler.html

Kapor, M. (1996). A software design manifesto. In Winograd, T. (Ed.), *Bringing Design to Software* (pp. 1-9). New York: Addison-Wesley.

Gal, S. (1996). Footholds for design. In Winograd, T. (Ed.), *Bringing Design to Software* (pp. 215-227). New York: Addison-Wesley.

Norman, D. (1996). Design as practiced. In Winograd, T. (Ed.), *Bringing Design to Software* (pp. 233-247). New York: Addison-Wesley.

Papert, S. (1991). Situating constructionism. In I. Harel & S. Papert (Eds.), *Constructionism*, (pp. 1-11). Norwood, NJ: Ablex. (This book chapter is available online: http://www.papert.com/articles/SituatingConstructionism.html

Papert, S., (1996). A word for learning. In Y. Kafai & M. Resnick (Eds.), *Constructionism in practice: Designing, thinking, and learning in a digital world* (pp. 9-24). Mahwah, NJ: Lawrence Erlbaum Associates

Sims, R. (1995). *Interactivity: A Forgotten Art?* ITFORUM [electronic listserv]. Athens, GA: The University of Georgia. Available: http://it.coe.uga.edu/itforum/paper10/paper10.html

At least 5 more articles/chapters of your choice. Below are some recommendations and resources.

Kafai, Y. & Resnick, M., (1996). Introduction. In Y. Kafai & M. Resnick (Eds.), *Constructionism in practice: Designing, thinking, and learning in a digital world* (pp. 1-8). Mahwah, NJ: Lawrence Erlbaum Associates.

Individual chapters from: Winograd, T. (Ed.). (1996). *Bringing design to software*. Reading, MA: Addison-Wesley.

Individual chapters from: Kafai, Y., & Resnick, M. (Eds.). (1996).*Constructionism in practice: Designing, thinking, and learning in a digital world.* Mahwah, NJ: Lawrence Erlbaum Associates.

Individual chapters from: M. Orey (Ed.), *Emerging Perspectives on Learning, Teaching and Technology.* Athens, GA: The University of Georgia, Department of Educational Psychology & Instructional Technology [On-line]. Available: http://itstudio.coe.uga.edu/epltt/

Rieber, L. P., Luke, N., & Smith, J. (1998). Project KID DESIGNER: Constructivism at work through play. Meridian: Middle School Computer Technology [On-line], 1(1). Available http://www.ncsu.edu/meridian/index.html

Essays and articles from Dr. Steven Draper's (Department of Psychology, University of Glasgow, UK) web site: http://staff.psy.gla.ac.uk/~steve/

Other articles/essays from ITFORUM: http://it.coe.uga.edu/itforum/

The following is a sample of articles chosen by EDIT 6210 participants for use during their comprehensive exam. You will need to locate these articles on your own.

Brown, J.S. and Duguid, P. (1996). Keeping it simple. In T. Winograd (Ed.), *Bringing Design to Software* (pp. 129-145). New York: ACM Press.

The Cognition and Technology Group at Vanderbilt. (1993). Toward integrating curricula: Possibilities from anchored instruction. In M. Rabinowitz (Ed.), *Cognitive science: Foundations of instruction* (pp. 33-55). Hillsdale, NJ: Erlbaum.

Miller, L., Chaika, M., & Groppe, L. (1996). Girl's preferences in software design: Insights from a focus group. *Interpersonal Computing and Technology: An electronic Journal for the 21st century*, *4*(2), 27-36.

Silber, K.H. (1998). The cognitive approach to training development: A practitioner's assessment. *Educational Technology Research and Development*, *46*(4), 58-72.

Vannatta, R. A., & Beyerbach, B. (2000). Facilitating a Constructivist Vision of Technology Integration Among Education Faculty and Preservice Teachers. *Journal of Research on Computing in Education*, *33* (2), 132-148.

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Biocca, F. (1992). Communication within virtual reality: Creating a space for research. *Journal of Communication, 42*(4), 5-22.

Blanchard, J. S., & Rottenberg, C. J. (1990). Hypertext and hypermedia: Discovering and creating meaningful learning environments. *The Reading Teacher, 43*, 656-661.

Blanchard, K., & Cheska, A. (1985). *The anthropology of sport: An introduction*. Massachusetts: Bergin & Garvey Publisher, Inc.

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Clark, J. M., & Paivio, A. (1989). Observational and theoretical terms in psychology: A cognitive perspective on scientific language. *American Psychologist, 44*(3), 500-512.

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Cunningham, S., & Hubbold, R. J. (Eds.). (1992). *Interactive learning through visualization*. New York: Springer-Verlag.

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diSessa, A. A. (1986). Artificial worlds and real experience. *Instructional Science, 14*(3/4), 207-227.

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Duffy, T. M., & Jonassen, D. H. (Eds.). (1992). *Constructivism and the technology of instruction: a conversation*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Duke, R. (1995). Gaming: An emergent discipline. *Simulation & Gaming, 26*(4), 426-439.

Eiser, L. (1993). Edutaining our kids. *Technology & Learning* (October), 26-33.

Fiedler, S. (1999). *The Studio experience: Challenges and opportunities for self-organized learning.* Available (online): http://it.coe.uga.edu/studio/fiedler.html

Finke, R. A. (1990). *Creative imagery: Discoveries and inventions in visualization*. Hillsdale, NJ: Lawrence Erlbaum Associates.

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Fosnot, C. T. (Ed.). (1996). *Constructivism: Theory, perspectives, and practice*. New York: Teachers College Press.

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