MEDIATED PEDAGOGICAL DESIGN:

THE CYCLES OF ITERATION INTERFACE

by

David Cotter Murphy

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APPROVAL

NAME: David Murphy

DEGREE: MA

TITLE OF THESIS: Mediated Pedagogical Design: The Cycles of Interaction Interface

EXAMINING COMMITTEE:

CHAIR: Prof. Pat Howard

Prof. Brian Lewis
Senior Supervisor,
Professor, School of Communication and
Dean of Applied Sciences, SFU

Prof. Richard Smith
Supervisor,
Associate Professor, School of Communication, SFU

Prof. Jim Bizzocchi
Examiner
Assistant Professor, Interactive Arts, SFU Surrey

Date: June 24, 2003

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Mediated Pedagogical Design: The Cycles of Interaction Interface

Author:

(Signature)

David Murphy

(name)

June 24/2003

(date)

ABSTRACT

This document is the written component of a mediated pedagogical design project that produced the Cycles of Iteration interface (see attached CD-ROM, or www.sfu.ca/media-lab/cycle). This interface was designed to assist the process of teaching video production to novice users. The design integrates synchronous presentation materials with asynchronous review and reference information, in conjunction with practical modules for each cycle of production.

The Cycles of Iteration interface represents an attempt to synthesize concepts of Media Literacy, Critical Pedagogy, and Design Theory into an interactive system of instruction. The field of Media Literacy provided a model for production other than the dominant cultural industry production model by positioning production as the "written" component of literacy. The ideas of personal experience and communities of practice were taken from the field of Critical Pedagogy. Design Theory provided practical methods for the development of the interface as well as philosophical foundations regarding aesthetics and the "humanization" of technology.

The design process for the Cycles of Iteration interface included scenario building and structural model development. Once a prototype of the interface was created it was tested using a pilot study of undergraduate students who informed further iterations of the design. An expert panel of professional video production instructors were also asked to comment on the interface.

The Cycles of Iteration interface was designed to assist the instructor lead process of video production. It was designed with aspirations of bridging a divide between practical production skills and critical media analysis by its incorporation into existing curricula.

For my mother, Joyce Murphy.

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LIST OF ABBREVIATIONS AND ACRONYMS

HCI Human Computer Interaction

URL Universal Resource Locater (web site address)

DV Digital Video (video format)

INTRODUCTION

The motivation behind creating a mediated pedagogical design for instructing video production comes from my experience as a media production teacher. I have taught novice videographers[1] who aspire to produce a great range of video productions, from better home movies, to politically active segments, to feature length documentaries. This range of aspirations creates difficulties for a pedagogical design including how an instructional system can be relevant to individuals with diverse learning requirements. I also see a need for a system of instruction in video production that can be used in various independent production environments, such as non-profit societies, Independent Media Centres, public schools, community based programs, and other groups whose access to resources are limited by social, economic, or geographic barriers. My intention for this mediated pedagogical design is that it can be a system that can provide an alternative to strictly preparing learners to work in the "winner-take-all" environment (Geuens, 2000) of the contemporary culture industry.

The problem then is to design a system of instructional resources for video production that can be useful across a range of user levels as well as being affordable and accessible to independent videographers. In an attempt to address this problem I am suggesting a mediated pedagogical design for video production that is based on cycles of iteration and delivered via the common

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[1] The term videographer refers to a person who produces a finished video product, usually taking on a majority of the tasks personally (i.e. camera operator, interviewer, producer, editor, etcetera.).

media presentation environment of a web browser. This mediated pedagogical design is intended to be a resource for teaching video production on as general a level as possible (i.e. not genre based, not specific to a particular video product) and to be used across a range of educational and independent production environments.

The outcome of my attempts to create a mediated pedagogical design to teach video production is the Cycles of Iteration web site (www.sfu.ca/media-lab/cycle or see accompanying CD-ROM). This site includes three iterations of the production process which are each divided into four quadrants namely: Pre-production, Production, Post-Production and Review. The three cycles of iteration are designed to take a novice videographer from a level of virtually no production knowledge to the point of producing a short, self-contained, and presentable video production. Although there is a desire to have a totally autonomous, self-directed pedagogical system, the complexities and subtleties of video production have resulted in this design being a hybrid that combines synchronous presentation materials with asynchronous review and reference information. As a result the Cycles of Iteration interface[2] has dual functions: As an instructor or facilitator lead teaching resource, and as a reference site for learners.

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[2] The term "interface" is used in this document to refer to the site of interaction with this pedagogical design, it is used to describe the object or artifact of the design process.

Problem Statement

The problem that I have tried to address in the design of the Cycles of Iteration interface is how to consolidate and organize the large volume of knowledge that is needed in order to take a novice videographer to the point of producing a finished video product.

User Profile

The Cycles of Iteration interface was designed to accommodate novice videographers and take them from never touching a video camera to the production of a short video. There is no specific age group for the user profile, but the need or desire to communicate through the production of video is assumed (See the scenario building section for examples of users).

Context

The design of the Cycles of Iteration interface was created with an intention to apply theories of critical pedagogy that investigate the relationship between experience, action, and knowledge within a practical design context. The pedagogical theories formed a foundation that drew attention to the process through which knowledge can be created (Lusted, 1986). The process of knowledge creation became important to the design method because it formed the observable (pilot study) and imaginable (scenario building) data.

Developing the Cycles of Iteration interface was also an examination of the way technology mediates our methods of knowledge transfer in contemporary learning environments. The browser-based interface represents a

form of informational mediation that is very much part of present-day education culture.

THEORETICAL FRAMEWORK

The term mediated pedagogical design represents the three theoretical traditions that were drawn upon during the creation of the Cycles of Iteration interface.

- Media Literacy
- Critical Pedagogy
- Design Theory

Media Literacy

Media Literacy is a term with many definitions. In the most general sense it refers to the development of knowledge of or training in the field of mass media (Television, print, video, Internet, new-media, etc.). A more expanded definition that raises issues of social responsibility is given by the Center for Media Literacy:

> Media Literacy is a 21st century approach to education. It provides a framework to access, analyze, evaluate and create messages in a variety of forms — from print to video to the Internet. Media literacy builds an understanding of the role of media in society as well as essential skills of inquiry and self-expression necessary for citizens of a democracy. (CML, 2003)

Within this definition there is only a brief nod towards the idea of the creation of media as a component of media literacy which is an indication of what I see as a underdeveloped aspect of the field. The Oxford English Dictionary

defines the term "literacy" as: "The quality or state of being literate; especially the ability to read and write." It is my opinion that Media Literacy as a field of study concentrates mainly on the critical analysis and evaluation of existing media, or in other words, the reading of media. The creation or writing of media exists predominantly within a cultural industry production model and not as a way of critically understanding a language of media. The development of the Cycles of Iteration interface was inspired by a perceived need to develop the "writing" aspect of media literacy.

Media literacy provides a framework for a model of production that can exist outside of the model dominated by the cultural production industry. With the exception of relatively few guides for production of ethnographic (e.g. Barbash, 1997) or activist video (e.g. Harding, 1997), the dominant model for teaching video production is to give students the skills required to make industrial forms of video such as dramatic scenes, title sequences, voice over narrations, and news stories. This adherence to the cultural industry model of production presents, in my view, a restriction to the potential of a more general form of media communication. Learning video production without the constraints of a cultural industry allows the freedom of individual expression within the new language of media. To become literate in this language one must be able to both read and write.

Advancing media literacy is one of my goals as a teacher of media production. I believe that an understanding of media production provides individuals with a greater ability to make conscientious decisions in our

increasingly mediated society. Raymond Williams refers to choices that we as a society have concerning developments in communication technology that can be a part of social development, social growth, and social struggle (1974, p136). These choices are better made through the demystification of media production that can lead to a greater understanding of how public opinion is formed.

The formation of personal and social identity is strongly influenced by the consumption of cultural production such as film, television, Internet, and other media. Marshall McLuhan theorizes that the dominant media of communication historically shapes the progression of society and culture (1962, 1964). We create boundaries that mystify or fetishize the production of mass media giving its message a heightened value and as a result its impact on our identity as citizens is increased. In order to begin to break down these boundaries we must develop a form of literacy that allows an understanding of cultural production. My experience as an instructor has taught me that learning the process of media production is a significant foundation to the advancement of Media Literacy.

Teaching media production necessarily requires the instruction of a set of skills and practices that often results in it being termed "vocational training" or "skilling." At the base of my efforts to create resources for teaching video production is a desire to educate students not only in practical skills but also in critical understanding of the role media plays in society. In this regard I agree with Stan Denski (1991) that an emphasis must be placed on the ethical and moral dimensions involved in the structures and processes of media production

as a practice (dimensions that are largely ignored by traditional methods of media vocation or "Industry" training).

Ethical and moral issues are not overtly addressed in the content of the Cycles of Iteration interface, however its design provides access to media production with as little beholding to industrial constraints as possible. The Cycles of Iteration interface was designed to maximize individual creativity and minimize equipment and resource constraints. There is as well a tacit understanding that the interface provides the skills training that frees up class time to critically discuss and analyze how the media production industry maintains and re-produces dominant cultural values. This allows the possibility of creating alterative media productions.

Critical Pedagogy

A critical pedagogy of media production is, in practice, a new concept. The bridging of media literacy with critical pedagogy provides enormous potential for learning about how and why media has such an impact on society. One of the challenges of this bridging is the breadth of skills required to learn media production can obfuscate less tangible inquiries of a moral or ethical nature. This is a challenge of practice that I have tried to address with the Cycles of Iteration interface by allowing it to present and review the more objective and practical aspects of production, something that a mediated interface is particularly good at doing. Whereas critical understanding of the role of media production in the construction of contemporary culture is a topic, I feel, best taught in a non-mediated dialogue.

Two specific pedagogical theories were involved in the design of the Cycles of Iteration interface that relate to video production as a social practice. Video production is inherently social because its communicational properties require an audience; furthermore the production of video often requires social interaction with co-producers (crew, talent, etc.). The skills and procedures required to produce video make it an experienced practice. These two aspects, social interaction and experiential practice, are addressed in the pedagogical theories of communities of practice by Etienne Wenger and the role of experience in education by John Dewey respectively.

Etienne Wenger proposes a social theory of learning that is based on participation within a community of practice. I have observed as a media production instructor that one of the great motivators production students have is the desire to be associated as part of the production industry community. Even as critical knowledge of the production industry is developed the desire to be accepted and rewarded by the community of professional production is undeniable. This motivation can be viewed as a challenge for media literacy and critical analysis but it can also serve as the inspiration that facilitates learning and the construction of meaning. The resulting situation is somewhat of a double-edged sword for a critical pedagogy of media production requiring a balance between the motivational desires of aspiring videographers and the development of critically conscientious media producers and consumers.

The inter-subjective nature of video production exists on a number of levels. One of the most noticeable levels is the public presentation of finished

works, or screenings. Public screenings of student-produced videos are an accepted and important part of learning the production process (see the Review sections in the Cycles of Iteration interface). However, few other endeavours in most students' experience require the same level of public exposure, scrutiny, and critique. The fear of public review can be a powerful motivator for any producer.

Another level of inter-subjectivity in video production is related to its collaborative nature. Although it is possible to produce video as an individual, a majority of production requires some form of social interaction, such as instructing crewmembers, directing talent, or securing permission to shoot a location. All such social interactions become part of a community of practice that leads to the creation of knowledge.

As presented in the book "Communities of Practice" (Wenger, 1998) learning is a result of social participation comprised of these components:

- **Meaning**: a way of individually and collectively experiencing our life and the world as meaningful. Meaning is ultimately what learning is to produce.
- **Practice**: shared historical and social frameworks that can sustain mutual engagement in action.
- **Community**: social configurations in which our enterprises are defined as worthy and participation is recognizable as competence.
- **Identity**: learning changes who we are and creates personal histories of becoming in the context of our communities.

These components exist in the community of practice that is formed by a group of video production students and should be considered during the implementation of a media production instructional environment.

Although John Dewey (1859 - 1952) wrote in an era with less emphasis on the concerns we have today about incorporating technology and media into learning environments, his comments on "traditional" and "progressive" education are still valid. Traditional education relies on institutionalized, historically defined subjects and methods, where as progressive education requires a dynamic adaptation to a changing society. Dewey presents an argument that requires education to be progressive (while not completely dismantling traditional practices) not just because it improves the educational system but because education in itself is a method of study by which we cumulatively examine knowledge, meaning, and values of the world.

Michael Eldridge (1998) describes the central aspect of Dewey's philosophy as "cultural instrumentalism," a positioning that understands thinking to be a tool for dealing with problems in the world. Dewey believed that the primary role of his work was to develop this tool (thinking) to better society and its members, and the key to doing this was through education. Education based on the "philosophy of the social factors that operate in the constitution of the individual experience" (Dewey, 1938). The factors, which he refers to as permanent frames of reference, are the organic connection between education and personal experience.

Dewey acknowledges that experience is present in a learning environment regardless of design so what really matters is the *quality* of experience. Two aspects of the quality of experience should be considered. First the immediate aspect of agreeable versus disagreeable experience, and secondly the influence an experience has on subsequent experiences. An ideal learning experience is immediately enjoyable and promotes having desirable future experiences. Therefore education is a development within by and for experience. There is a continuity or a "experiential continuum" in that every experience both takes up something from those that have gone before and contributes to the quality of those to come (Dewey, 1938).

Experience is essential to learning the process of video production. The concept of "learning by doing" is at the foundation of this entire mediated pedagogical design. Each cycle of iteration is coupled with a practical module that is produced and reflected upon (see the scenario building section for examples of practical modules). The experience and self-reflection that is gained from each iteration not only give practice to concepts presented but also challenges areas of conceptual uncertainty by forcing a concrete outcome (the finished production).

Design Theory

The term "Design" is used in many different fields of study. Architects, graphic artists, landscapers, fashion creators, system scientists, mathematicians, pedagogues, all claim to be designers and to have a theory of design specific to their field. However, the common idea that all theories of design address is the

improvement of future outcomes. To this end there is an emerging field of pure design studies which attempts to integrate disciplines of understanding, communication, and action with the intention of improving society's development by the humanization of technological progress (Buchanan, 1996).

Design studies have been emerging as form of integrating knowledge that combines theory and practice to help negotiate the complexities of our current technological culture for the better part of the 20th century. Walter Gropius inaugurated the Bauhaus school for realizing a modern "architectonic" art in 1919, with the guiding principal that design was "an integral part of the stuff of life, necessary for everyone in a civilized society" and that it would avert society's "enslavement by the machine" (Gropius, 1943). Design still eludes a specific definition or even a set of accepted practices and continues to grow in scope to what is now recognized as a "new liberal art of technological culture." (Buchanan, 1996)

Attempts to systematize a science of design have been made, such as Herbert A. Simon's book "The Science of the Artificial" (1996). Simon presents methods and procedures based on logic and analysis to suggest a system by which design problems can be evaluated and ultimately solved. This approach, however, turns out to be less effective in practice because of the multitude of indeterminable factors that arise during the design process. A science of the artificial assumes an almost perfect condition of human intentionality, a condition that as of yet does not exist. As a result design remains an idiosyncratic domain

that lends itself to iterative structures, intuition, improvisation, and creativity more so then to the scientific method.

An area of design theory that was called upon during the development of the Cycles of Iteration interface comes out of the field of Human Computer Interaction (HCI). Recent trends in interactive systems research have indicated foundations for a new design and analysis approach that draw upon developments, throughout the twentieth century, in phenomenology and ethnomethodology. This foundational framework is encapsulated in the concept of embodied interaction, developed in particular by Paul Dourish (2001).

Embodied interaction is a perspective that includes aspects of tangible and social computing by accepting the act of interacting with technology as a part of a broader system of meaning that is constructed from the specific settings (physical, social, organizational, cultural, etc.) in which the action takes place. Embodied interaction is concerned with how meaning is created, established and communicated through the incorporation of technologies into practice. It exists as an organizing principal that has been developed to inform the design and analysis of the interaction between individuals and technology within a social context.

Using an embodied perspective to view the pedagogical ideas of communities of practice and experience allows the bringing together of two domains of knowledge and practice, namely embodied interaction and critical pedagogy. The result is a movement towards a theory that can inform the design of interactive pedagogical media.

Design studies have produced a number of methods and procedures that can improve future outcomes. The two specific methods used in the development of the Cycles of Iteration interface were Scenario Building and Modelling.

DESIGN PROCESS

The first design decision, after a problem statement and user profile had been decided, was the medium for the interface. Initially the idea was to create an interactive DVD that was menu driven and contained video and audio examples of concepts. The reason for not perusing the DVD option was because the production requirements were not justified for the level of instruction needed. The Cycles of Iteration interface is designed for the novice student and most of the examples were as effective as stills and text as they were with full resolution video and audio. However, there are elements that could have benefited from video examples (i.e. transitions in section 3c), therefore, the interactive DVD is still being considered for future developments in pedagogical design. A "browser" based or HTML based interface was decided on because of its ubiquitous nature and the ease of development.

Initial design prototypes included some larger video, image, and audio files with the intention of the interface being served on local computers or from CD-ROM. The added pedagogical value of the larger files was not significant enough to out weigh the advantage of creating a centrally served web-based interface. The problem with the larger file on the locally server version was that any updates would require re-loading the interface on multiple computers. A centrally served web-based interface can be updated from a single point and accessed from a web browser on any computer with an Internet connection.

Whereas with a locally served interface the number of access points for students is dramatically reduced.

Once the decision to create a centrally served web-based interface was made the problem arose of reducing file sizes so that access from slower network connections would still be effective. A balance between effective communication and image compression quality or image size was determined based on numerous test sites that were examined using various network connections. The interface did not seem to be effective unless there was almost instantaneous response to user interaction. For a perceptibly instantaneous response the interface files had to be as small as possible. This was achieved by maximizing image compression and the extensive use of white space (which is more easily compressed) throughout the site. The initial web-based interface that was used in the pilot study consisted of approximately 450 files and is a total of 3.9 Megabytes.

Jakob Nielsen suggests that size limits for web pages, in order to achieve a desired response time (see latency times below), is between 8k and 100k (based on average ADSL home internet connection bandwidth). These limits provide the user with a sense that they are moving through an "information space" freely (Nielsen, 1997). Almost all of the pages in the Cycles of Iteration interface are between 8k and 24k, depending on the number of images used, which provides adequate latency times to maintain user focus. Nielsen states in his writings about usability engineering that his basic advice regarding computer

interface response times is: The faster the better (Nielsen, 1994). A brief summary of how latency times affect the usability of a web site are given here:

- **0.1 second** is about the limit for having the user feel that the system is reacting instantaneously, meaning that no special feedback is necessary except to display the result.
- **1.0 second** is about the limit for the user's flow of thought to stay uninterrupted, even though the user will notice the delay. Normally, no special feedback is necessary during delays of more than 0.1 but less than 1.0 second, but the user does lose the feeling of operating directly on the data.
- **10 seconds** is about the limit for keeping the user's attention focused on the dialogue. For longer delays, users will want to perform other tasks while waiting for the computer to finish, so they should be given feedback indicating when the computer expects to be done. Feedback during the delay is especially important if the response time is likely to be highly variable, since users will then not know what to expect. (Nielsen, 1994)

Donald A. Norman writes extensively on the humanization of technology and design (see jnd.org). He advises, in concurrence with Jakob Nielsen, that content and the speed with which it arrives are the most important properties of a website. To this end careful consideration should be given to graphics in that they should never be gratuitous or in any way unrelated to the content of the website. Norman also recommends that a website design should use HTML code that is as simple as possible and to eliminate any graphical elements that do not directly add to the informational content of the website (Norman, 2002). These admonitions were used in the design of the Cycles of Iteration interface by reducing image size, using graphics only to inform content, and keeping the HTML code to its simplest reduction.

A significant challenge to the creation of the Cycles of Iteration interface was the complexity and volume of the content material. Careful attention was paid to the reduction and simplification of content material to maintain the focus of the learning objectives and not to confuse the user with too many specific or technical details. Edward Tufte's writings on designs for the display of information provided many examples (both good and bad) that helped with the design of this project (Tufte, 1983; Tufte, 1990; Tufte, 1997). Tufte emphasizes that design is choice, and that choices should be made with grace, elegance and personal vision. Tufte's epilogue in The Visual Display of Quantitative Information:

> What is to be sought in designs for the display of information is the clear portrayal of complexity. Not the complication of the simple; rather the task of the designer is to give visual access to the subtle and the difficult – that is, the revelation of the complex (Tufte, 1983, p.191).

The structural model for the Cycles of Iteration interface is the foundation that the entire design is built on. The model is an expanding spiral that starts in the centre and continues clockwise, expanding to a new level after each cycle. The concept behind the spiral structure is to re-enforce the iterative nature of video production, and to represent the idea that knowledge and skills are built upon knowledge and skills developed in previous cycles.

To define what content should be included in each cycle and in what order the information should be presented, the method of scenario building was employed. Three scenarios were developed that included a brief characterization of a potential user as well as the context in which the interface

might be used. In addition, three practical modules were developed for each scenario that correspond to each of the three cycles in the interface.

The development and implementation of user scenarios was crucial to the interface design. The scenarios, especially the practical modules, informed the content of the design by providing sequential requirements of knowledge that would be needed to complete each goal. The definition of the user modules was therefore the most important component of the scenario building exercise.

File structure was an important consideration in the design process from the onset. Ramifications of organizational decisions concerning file structure that were made at the beginning of the process would magnify as the number of files were added to the design. The file structure had to be able to maintain the organization of an unknown number of image and text files, as a result the design of the first iteration had a couple of false starts due to unwieldy file management. The number of files could be expected to increase with consecutive iterations (due to an increase in complexity of content with higher level iterations) so if the file management system was hard to control in the first iteration it was better to redesign the system before continuing. The resulting file system combines a hierarchic structure and a nomenclature system that reflects the overall structural design of the interface. Each iteration (1,2,3) is divided into four quadrants (a,b,c,d) each of which have two sections (concepts and slide show).

Development of a structural model

Hermeneutic cycle

The hermeneutic circle refers to the circle of interpretation that is involved in the understanding of knowledge. The concept is a way of stating that understanding and knowledge is a cycle of exposure to information (texts), interpretation, then re-exposure to texts. Subsequent exposure to a text is influenced by the interpretation of the previous text. This concept forms the foundation for the structural model in the Cycles of Iteration design.

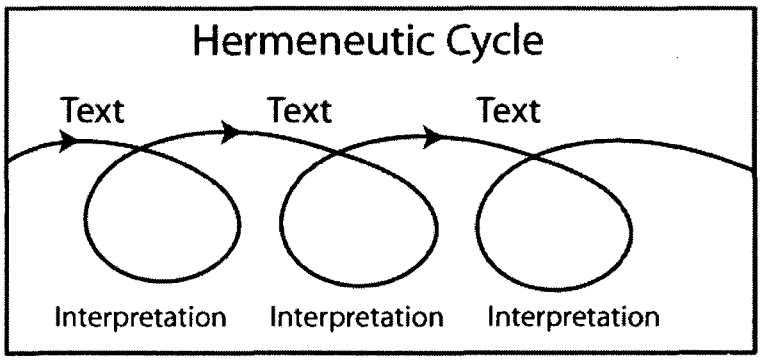

Figure 1 Hermeneutic Cycle

Hans-Georg Gadamer refers to a circular process of hermeneutic interpretation where meaning is always negotiated between one's own preconceptions and those within the horizon of the other (Gadamer, 1979). The cycle exists between subjective knowledge and objective experience of a text.

Kitaro Nishida uses a concept of "basho" to represent a place between subjective and objective experiences. Knowledge is created in the space where

subject and object unite (Nishita, 1990). The union of the subject and the object occur when a concept is internalized to the point of realization or practice. It is the balance between explicit and tacit knowledge.

The structural model for the Cycles of Iteration is an expanding spiral. Each iteration builds on knowledge from the previous cycle.

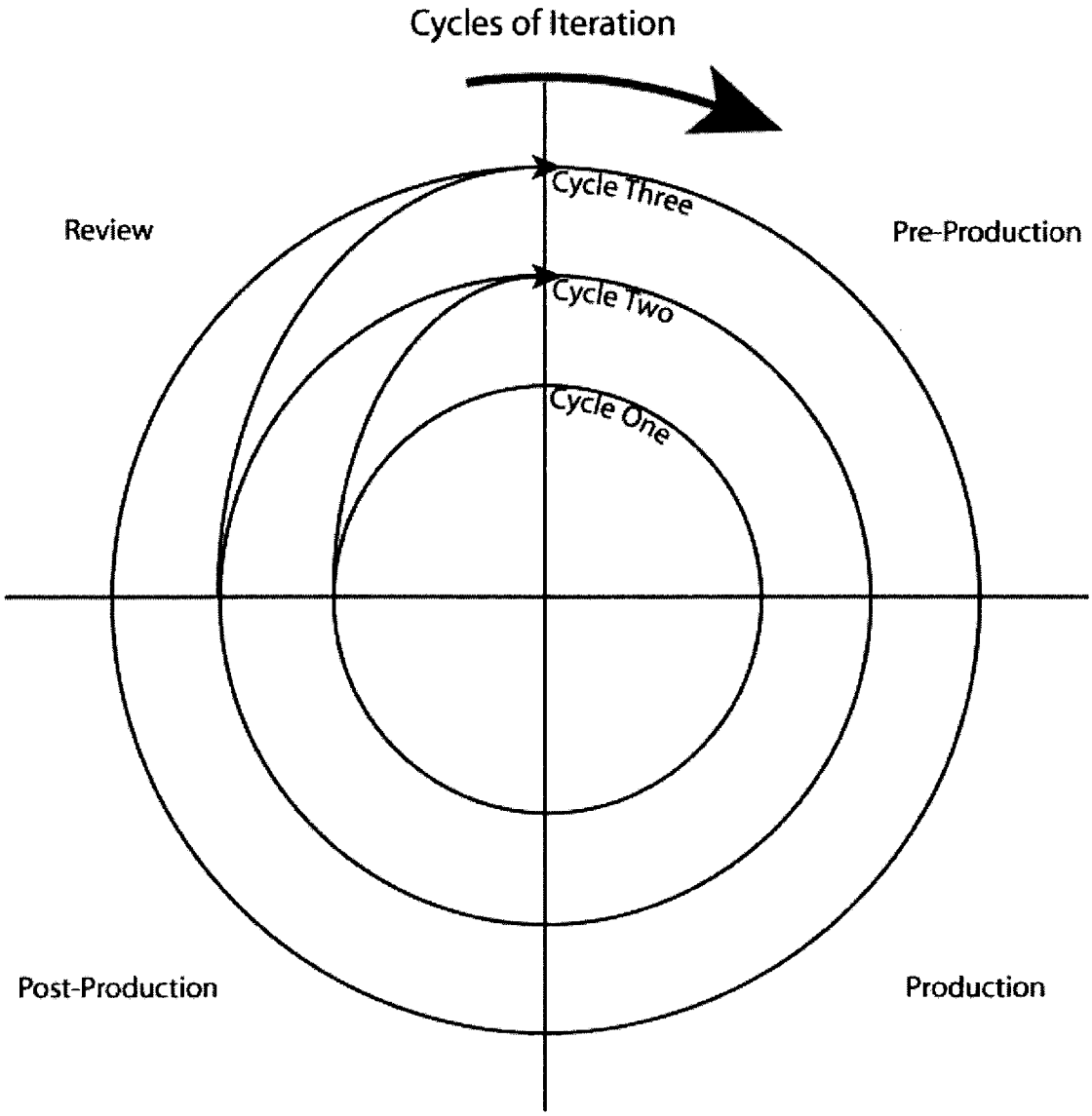

Figure 2 Cycles of Iteration Structural Model

The design is intended to imply expanding cycles that increase in complexity and are built upon knowledge created in previous cycles. Each iteration is coupled with practical modules (see the scenario building section) that allow the user to realize concepts. The combinations of presentation, review, and practice are inherent to the design as a method of knowledge creation.

The cyclic form of the structural design is divided into four quadrants. Each quadrant represents a stage in the production process. Most established textbooks state the first three stages in the production process, namely Pre-Production, Production, and Post-Production (for example: Anderson, 1999; Barbash, 1997; Hempe, 1997; Long, 2000; Rabiger, 1998; Zettl, 1995). However the fourth stage, Review, is usually regarded as outside of the production process. The reason I have included a Review section as one of four elements in the production process is because it serves a critical pedagogical purpose.

The Cycles of Iteration structural design implies the continuation from ending one iteration to the beginning of the next. The Review section allows a moment of reflection before beginning the process again. This reflection has the potential of teaching the producer about strengths and weaknesses in their endeavours, ideas that seemed understood might not have been communicated or intuitive actions during production may be explicitly recognized. It has been my experience that public critique and evaluation sessions of student productions have consistently been identified as one of the most significant learning moments (and sometimes the most difficult) in the production process.

The immediate experience that affects the design of the interface includes aspects such as speed of access, aesthetics (uniform, achromatic), ease of use, conceptual and navigational layout, etc. The allegorical nature of the structural design is meant to remind or make reference to previous experiences of the user. For example when a user is about to start the third iteration all four sections of the first two iterations are visible as reminders of lessons and practical skills that were learnt in past experiences. The intention is that these experiences will inform and inspire the participation in current and future experiences as they are presented in the model

Scenario Building

Scenario building is a method of developing usability requirements or goals for a particular design. Scenarios can be used to identify and address implications of design options and interface issues that arise during the initial design process (Carrol, 1995). Scenario building can help to inform the design process about the way people may react to a design within a specific situation.

During the initial design process scenarios can provide a rich source of ideas by allowing usability requirements and targets to be generated through the identification of user characterizations. Scenarios offer concrete representations of design requirements by defining intended end users' identities, goals, tasks, and their general working context (Clark, 1991).

The process of creating design requirements using scenarios requires functionally deconstructing user goals into the operations needed to achieve

them. This is done by the creation of "mental maps" that allow an insight into uncertainty by the development of characters and stories (Schwartz, 1991).

The following are scenarios were developed with the intention of providing a user insight into the design of the pedagogical model. The scenarios are used to envision the completion of three example modules that correspond to the cycle iteration in the model.

Scenario 01

Ted, 23, third year Anthropology major at university. Moved to Vancouver four years ago from Singapore. He is interested in learning video production to document an archaeological dig he will be attending in Singapore next year. Ted has no previous video production experience but is interested in computers and digital photography. This scenario is based on conversations with undergraduate students at Simon Fraser University.

Practical Modules:

Cycle 1: Scavenger Hunt

A list of single shot descriptions that include framing and movement indications (e.g. CU of someone reading, MS of a financial transaction, WS of people waiting in a queue, PAN across a crowd, etc.)

- Time limit for shooting (30-45 min)
- Total time of cycle (approximately): 2 to 3 hours

Cycle 2: Road Trip

A sequence of scenes depicting the journey from home to school are planned out in pre-production and shot continuously and in sequence during production.

- In-camera edits
- Limit of raw footage (2.5 minutes)
- Total time of cycle (approximately): 1 day to 1 week

Cycle 3: Profile

Video portrait of someone (class mate, relative, friend). Portrait can include interviews, visual evidence and contextualization, audio layers such as music and narration.

- One-minute time limit of final video
- Post-production includes editing
- Total time of cycle (approximately): 1 to 3 weeks

Scenario 02

Helen, 45, is an assistant head day nurse at local general hospital. She has been a nurse at the same hospital for 15 years. She wants to learn some video production skills to be able to participate in a new program that is archiving procedural video documentaries to help staff learn how to use specific equipment. She thinks the new program has a lot of merit but she is quite anxious about using video and computer technology. This scenario is based on events that took place during a workplace learning initiative that employed self-

produced videos as educational tools in a hospital intensive care unit. (Bjorgvinsson and Hillgren, 2002).

Practical Modules:

Cycle 1: Equipment shot list

A list of single shot descriptions that include framing and movement indications (e.g. CU of power switch, MS of the entire apparatus, WS of equipment in its location of use, PAN from equipment to person operating it, etc.)

- Time limit for shooting (30-45 min)
- Total time of cycle (approximately): 2 to 3 hours

Cycle 2: Equipment use preparation

A sequence of scenes depicting the movement of equipment from storage to a location of use are planned out in pre-production and shot continuously and in sequence during production.

- In-camera edits
- Limit of raw footage (2.5 minutes)
- Total time of cycle (approximately): 1 day to 1 week

Cycle 3: Instructional Video

Instructional video of a piece of medical equipment in use, including operator and patient. Portrait can include interviews, visual evidence and contextualization, audio layers such as operator or patient commentary, equipment sounds and narration.

- One-minute time limit of final video
- Post-production includes editing
- Total time of cycle (approximately): 1 to 3 weeks

Scenario 03

Steve, 17, is enrolled in an inner-city program set up to assist youth. Video production is used by the program as a means of empowering members and instructing them on issues like social justice, responsibility and project management. Steve likes video production because it makes him feel in control and he likes it when people are impressed with his work. The administrators would like a set of videos that can be used to orientate newcomers to the rules and policies of the program. Steve wants the task of producing this set of videos but he lacks the skills. This scenario is based on conversations with an instructor of video production for a similar program.

Practical Modules:

Cycle 1: Shot list of scenes

A list of single shot descriptions that include framing and movement indications (e.g. CU of a young person's face, MS person sitting at a desk, WS of a class of youth all at desks, PAN from class room to the exit, etc.)

- Time limit for shooting (30-45 min)
- Total time of cycle (approximately): 2 to 3 hours

Cycle 2: Accessing the Facility

Sequence of scenes depicting the journey from home to the facility are planned out in pre-production and shot continuously and in sequence during production.

- In-camera edits
- Limit of raw footage (2.5 minutes)
- Total time of cycle (approximately): 1 day to 1 week

Cycle 3: Rule #1

Short video that informs newcomers to the facility about one of its rules (e.g. the rule that only one person talks at a time that is designed to encourage listening and facilitate communication). Video can include interviews, visual evidence and contextualization, audio layers such as music and narration.

- One-minute time limit of final video
- Post-production includes editing
- Total time of cycle (approximately): 1 to 3 weeks

OUTCOMES AND EVALUATION

Evaluation Criteria

In 2000 a study was conducted that identified a ranked list of evaluation criteria that could assess the potential quality, appropriateness, and effectiveness of instructional multi-media courseware. (Gibbs, 2000) The study used the Delphi Process[3] with a panel of instructional technology "experts" to rate a list of evaluation criteria that was compiled from a literature review. For the study an expert was someone who currently publishes, teaches, or is employed in the field of computer-based courseware design, development or evaluation. The study determined a list of 16 criteria, with an associated category (see Table 1), that create a useful starting point for a pedagogical design and evaluation.

The questions that came out of the "Identifying Important Criteria for Multimedia Instructional Courseware Evaluation" study by William Gibbs (2000) were used as both criteria to be adhered to while designing the interface and as a source of inquiry for the students who were involved in the pilot study using the Cycles of Iteration interface. Some of the questions are not applicable such as ones referring to testing and feedback because the Cycles of Iteration interface does not include these elements.

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[3] The Delphi Process is an iterative consensus building process that allows group-based decisions to be made on a common interest. The process includes the use of an anonymous feedback loop to cycle information back to the group until a consensus is reached. It is often used for forecasting futures and is an appropriate method for technologically mediated group decisions. Developed in the 1950s by Olaf Helmer and Norman Dalkey. More information see (Linstone, 1975).

#	CATEGORY	*Criteria*
1	Information Content	Does the courseware provide accurate information?
2	Information Reliability	Are the answers provided to questions correct?
3	Instructional Adequacy	Are practice activities provided in the courseware to actively involve the learner?
4	Feedback and Interactivity	If a test is used, are test questions relevant to the courseware objectives?
5	Clear, Concise, Unbiased Language	Are sentences written clearly?
6	Evidence of Effectiveness	Did learners learn from the courseware?
7	Instruction Planning	Is a definition of the target audience and prerequisite skills given in the courseware?
8	Feedback and Interactivity	Is feedback appropriate?
9	Instructional Adequacy	Are instructional objectives clearly?
10	Support Issues	Are the computer hardware and software requirements for the courseware specified?
11	Information Content	Are examples, practice exercises and feedback meaningful and relevant?
12	Interface Design	Is the courseware screen layout easy to understand?
13	Instructional Adequacy	Is the purpose of the courseware and what is needed to complete the lesson made explicit?
14	Information Content	Is the information current?
15	Interface Design	Do learners understand directions for using the courseware?
16	Instructional Adequacy	Does the courseware provide adequate support to help learners accomplish the lesson objectives?

Table 1 Evaluation Criteria for Multimedia Instructional Courseware (Gibbs, 2000)

Students in the pilot study responded positively to questions about clarity of writing by making statements like the interface instruction was "easy to understand" or "simply laid out." The students checked the accuracy of the information to the extent that they pointed out typing errors or other such mistakes, however verification of content accuracy was better made by review by experienced video instructors. The criteria that received mix reviews were based on clarity of instructional objectives. Students stated that the design of the interface was "too general" and that they would like more examples that were specific to their assignments. To address this is a matter of balance between creating a general interface that can be used in a broad range of situations with one that addresses specific practical modules. Comments about whether the interface provided adequate support to accomplish objectives were helpful in identifying areas that could be expanded on in the future. These comments included specifics about confusing skills (such as importing and exporting from and to video tape) as well as more general statements about formal design and narrative structure (see cycle observations in the next section).

Pilot Study

Development of the Cycles of Iteration interface was assisted using the process of a situated design inquiry, or what might be called "design through use." Situated inquiry can be described as a:

> ...new framework for understanding innovation and change. This framework has several key ingredients: It emphasizes contrastive

> analysis and seeks to explore differences in use. It assumes that the object of study is neither the innovation alone nor its effects, but rather, the realization of the innovation--the innovation-in-use. Finally, it produces hypotheses supported by detailed analyses of actual practices. These hypotheses make possible informed plans for use and change of innovations. (Bruce & Rubin, 1993, p. 215)

Users (in this case students) participate in the design development by their contributions of content suggestions and evaluations of the design's usefulness. The methods employed include a pilot study of an implementation of the interface in which interviews and participant observations were done to asses the level at which the design meets the specific needs of the students. This study used situated evaluation as a way to examine the interaction between a newly developed mediated pedagogical design and the specific, contextual and experiential circumstances of a group of users.

The Cycles of Iteration interface was pilot tested using a group of 24 undergraduate students enrolled in a Communication course entitled "Introduction to Digital Video." The course was offered at a second year level with no production experience required. An initial survey of the students indicated that only two of them had any video production experience. The intention of the pilot study was to gather feedback and observations of end users while the interface was still being developed in order to inform its design rather than to make an evaluation of a final product. Although, an evaluation of the design could be extracted from the information gathered.

Students enrolled in the class were asked to participate in a research project to help design the pedagogical resources that would be part of the course. All students agreed to participate and were given an informed consent form indicating what participating would involve and contact information for registering any complaints or questions in accordance to Simon Fraser University Research Ethics policy (see Appendix A).

The design of the Cycles of Iteration interface allows for more complex issues to be presented with subsequent iterations. This results in more time required to complete higher-level cycles. The following table gives the time requirements needed to present each cycle and complete the related module during the pilot study.

Cycle	PRESENTATION OF MATERIAL	Completion of Module	*Dates*
Cycle 1	Pre – 10 min Pro – 20 min Post – 5 min Review – 5 min **Total – 40 min**	Production – 60 min Screening – 60 min	January 6, 2003 **Total time: 1 day**
Cycle 2	Pre – 60 min + discussion (20 min) Pro – 15 min	Pre-Production With some Production – 1 Week	January 13, 2003
	Pro – 40 min Post – 30 min	Production and Post-Production – 1 Week	January 20, 2003
	Review – 20 min **Total – 3 hours**	Screening – 2 hours	January 27, 2003 **Total time: 2 Weeks**
Cycle 3	Pre – 20 min part 1	Pre-Production – 1 Week	January 27, 2003
	Pre – 2 hours part 2 Pro – 40 min	Production – 1 Week	February 3, 2003
	Post – 2 hours + 30 min for questions	Post-Production – 1 Week	February 10, 2003
	Review – 20min **Total – 5.8 hours**	Screening with critique – 4 hours	February 17, 2003 **Total time: 3 Weeks**

Table 2 Dates and Times for Completion of Each Practical Module

Observations of how students reacted to the presentation or slide show portion of the Cycles of Iteration interface were recorded in the form of field notes that were made at the end of each week. In addition to observations, informal questions were asked of the students about what they remembered most from

last weeks presentation and about what additional content could have been included to assist the completion of each practical module.

The following is a summary of my observations and student comments that could be incorporated into the interface design.

Cycle One

Pre-production

- Orientation of videotape when inserting it into the camera was not clear for some.

Post-production

- People who have any trepidation about connecting video equipment were shy to try in front of the class and would leave the task to people more familiar with it. VCR connections should be part of the practical module.

Review

- Allow plenty of time for review.
- The practical module was not fully understood by all students, so a more precise description is needed.

Cycle Two

Pre-production

- Narrative structure is difficult to understand, more examples and diagrams would be helpful
- Some acoustic examples for the equipment section would help demonstrate the microphone.

Production

- A visual image of a Videographer, showing mic, camera, headphones, etc., would help define the term.
- Correlations between shot composition and the resulting meaning is needed, for example high angle shot means a diminutive shot.

- The production quadrant should be given in the first week but the pre-production quadrant seemed too long.

Post-production

- Explanation on how to use the interface simultaneously while using editing software on a computer was not understood by all the students

- Comments students made while editing (problems they had trouble solving)
    - Focus lesson needed earlier
    - Drag-and-drop audio file icon
    - Waveform display in sequence preferences
    - Rubberband on/off
    - Visual Audio editing
    - AV preferences for FireWire vs. Desktop display
    - Recording output to camera (VTR, record)

Review

- All 12 assignments were done on time and on tape ready to present (it has never happened before that all first assignments are done on time without intervention).
- Overview of Review process including evaluation and critique criteria and framework took about 20 min.
- Screening of all 12 pieces took about 2 hours
- Lively discussion followed the screening of each piece. Students are very happy to talk about their own work and work of other peers. Critique session is a great chance to interact and debate issues of perception, audience reaction, levels of communication, salience of concepts, etc.

Cycle Three

Pre-production

- Long time to explain (2 hrs. for pre-), lack of slides makes this section a little dry.
- Using descriptions of characters as a way to demonstrate on-screen persona, important for interviews.

Production

- Actual demonstration of interview setup reviled how important pre-production concepts are.

- A lot of confusion and indecision made for some less than satisfactory compromises on the shots.
- Too much time spent trying to fix problems.
- Lacked the Affect due to no pre-production planning
- Make the pre-production part of the exercise
- Have the proposal, research, and treatment done before the interview in the exercise.

Post-production

- Questions and comments from users. (Issues that were difficult to understand)
    - How to use the **Iris** controls (Production)
    - Explain **rendering**
    - What is a **cross-dissolve** (video example?)
    - Explain file **management**
- Only works when in conjunction with the live demo. Interaction would be improved by having both interfaces at once.
- This level of lesson requires presenting, demonstrating, trying, reviewing, re-trying, doing.
- Mention about monitoring your production, making VHS dub to watch on your regular Television to give a "calibrated" reference.

Review

- This project is very personal and caution must be taken against insulting or upsetting producers.
- Variations on self contained movie files and title frames (main mistake was 22 KHz audio, and format inconsistencies with still image).
- Wide range of productions, the best seemed to adhere to a narrative structure or aesthetic design.
- Future cycles in pre-production should include aesthetic design
- Presentation can include web based delivery
- Include web stats on site hits as a "ratings" measure.
- Students are very interested in seeing their own work on a web site.
- Almost 4 hours to screen and critique all 24 projects.

Expert Panel

In addition to the pilot study the Cycles of Iteration interface was sent to a number of "experts" who are or have been employed professionally in the field of instructing video production. The responses from this expert panel were intended not only to provide constructive criticism on the interface but also to elicit new ideas for content and design based on their experience in this area. Each expert was given the URL for the Cycles of Iteration interface along with a brief description of the project and an example of practical modules that could be used for each iteration. Feedback from these experts was gathered from interviews (in-person or by telephone) or from emailed comments.

The comments from the expert panel agreed that the content of the Cycles of Iteration interface was accurate and clearly presented. There were some suggestions that the attempt to create a general interface that could be used by a broad range of users was both a strength and a weakness in the design. It was suggested that the model (expanding spiral) was a good general design but as each iteration increased in complexity more specific information is required, which works against the idea of a general interface. Other suggestions related to this were that general information and specific information be separated so that the interface is based only on the general but spaces are made to "plug in" specific modules. The nature of video production necessarily requires very specific instruction based on equipment, software, and the uniqueness of the production itself. This necessity was balanced with a criteria set out in the problem statement for this design that was to make a general interface for

advancing novice Videographer. Strategies to address this balance between generality and specificity would be one of the first areas to address in future re-designs of this interface.

A suggestion that came out of the expert panel was to create a separate page that contained links to other related web sites. This would provide users interested in related topics a starting point for further research, as well as give students the impression that the area of video production can be quite vast and open-ended. Another recommendation was to break down the script writing section to include sections on "the idea" and "the outline" as a way to build up to an actual script.

Web Statistics

Weekly statistics of hits to the web host site were accumulated over the time of the pilot study. These statistics can show some of the general patterns of use on the Cycles of Iteration web site. The site was not activated until the week ending with January 24th. At this time the pilot study group was into their cycle 2 project, the Road Trip. Prior to this time the site was used as a presentation or on a single computer for reference. The completion time for the first cycle (one day) does not allow for much review. The consistent number of hits on the first and second cycles right through to end of the pilot study (April 4th) could indicate the review process happening as intended by the design.

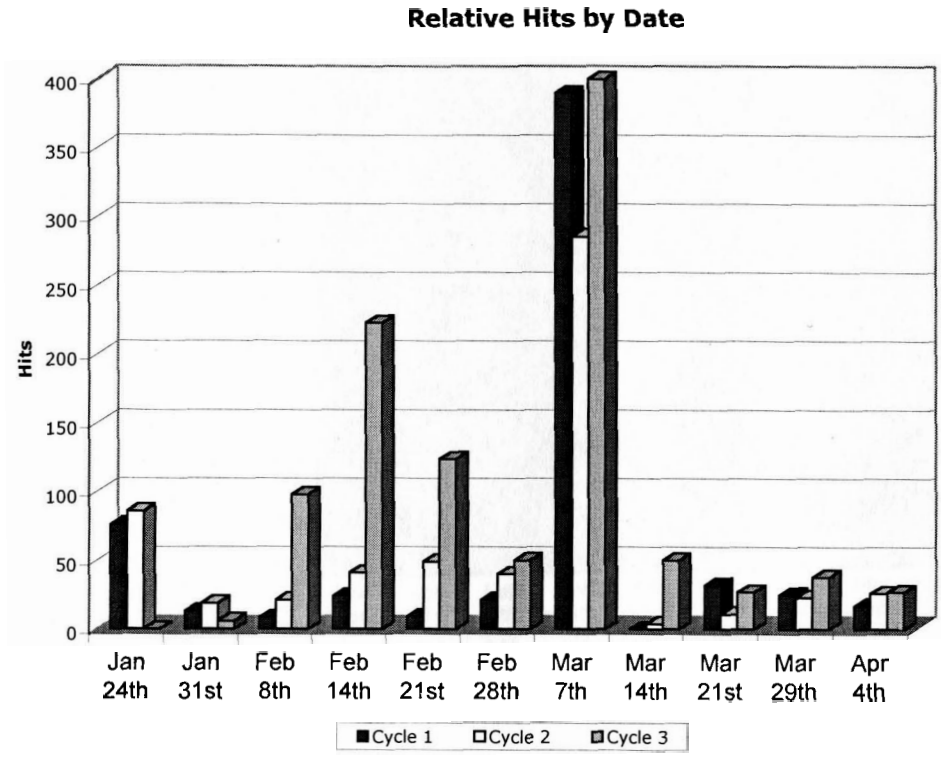


Figure 3 Hits on the Cycle of Iteration Web Site for Duration of Pilot Study (Dates represent the end of that week)

The dramatic increase in hits that occur in the week ending March 7th is due to a mid-term exam that was given that week. This peak of activity does not reflect how the site was intended to be used but it does show the undeniable importance university students place on exams.

It should be noted that the designed use of the Cycles of Iteration interface integrates modes of presentation and review. The data for site hits represents only the review mode within the context of the undergraduate university student. Also, many students preferred to print a hard copy of the concept pages for each cycle and refer to that rather than going back to the web site.

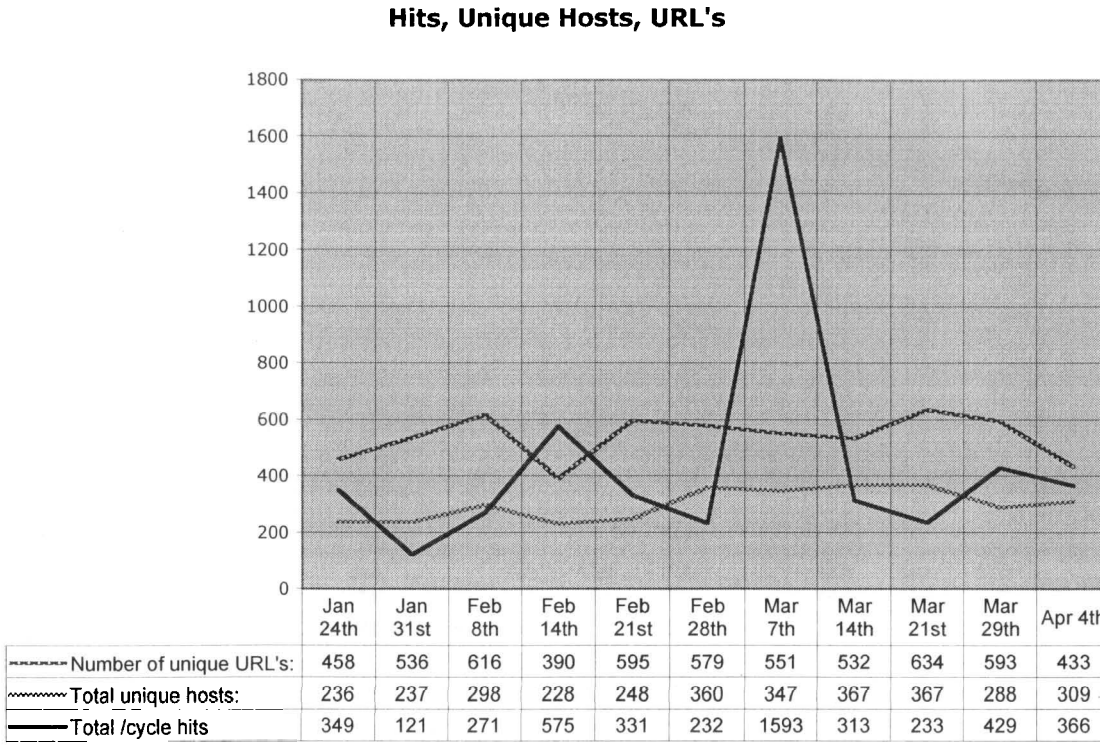
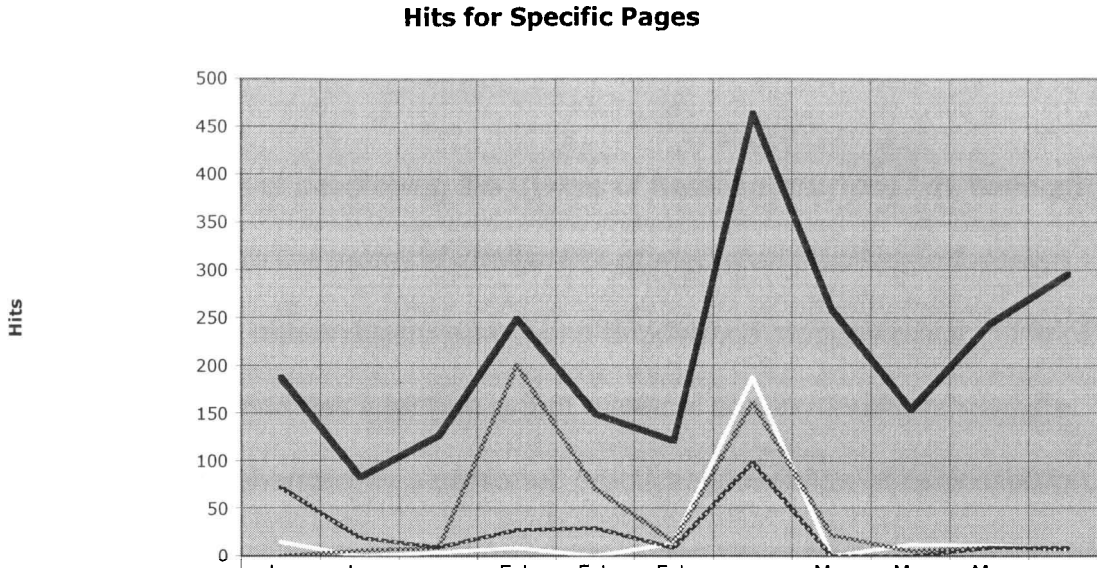


Figure 4 Hits, Unique Hosts, Unique URL's for Duration of Pilot Study (Dates represent the end of that week)

With the exception of the mid-term exam peak there seems to be a contrapuntal relationship between the total /cycle hits and the Unique URL's. This represents more activity on fewer pages. The number of unique hosts accessing the /cycle site showed a slight increase during the pilot study.



	Jan 24th	Jan 31st	Feb 8th	Feb 14th	Feb 21st	Feb 28th	Mar 7th	Mar 14th	Mar 21st	Mar 29th	Apr 4th
/cycle	187	83	126	249	149	121	464	259	154	244	296
/cycle/cycle1/1a	14	0	4	8	0	13	187	0	12	11	7
/cycle/cycle2/2c	72	19	9	27	29	8	98	0	0	8	8
/cycle/cycle3/3c	0	6	8	200	71	14	161	22	5	9	7

Figure 5 Hits for the Top Pages for Each Quadrant.

The pages that contributed most to this increase of activity are:

1. Cycle 1a. Pre-production, first iteration, introduction to basic camera use and shooting.
2. Cycle 2c. Post-production, second iteration, digitizing footage, still frames, adding audio.
3. Cycle 3c. Post-production, third iteration, assemble editing, insert editing, transitions, titles.

DISCUSSION AND CONCLUSION

The process of developing the Cycles of Iteration interface has been an exploration into both the practical challenges of mediated pedagogical design and the theoretical reasoning for attempting to advance media literacy. One of the main ideas behind this interface is that a critical understanding of media's role in society is enhanced by a personal, practical knowledge of its production. The intention of the Cycles of Iteration interface has never been to just supply an educational resource for video production; rather it has been to create a system that can enhance an instructor lead study into how media can construct and influence our culture. This intention can only be realized by the conscious practice on the part of the instructor to emphasize a critical analysis of media and its influences on society. The Cycles of Iteration interface can free up an instructors time and effort to make that emphasis possible. Its modular and generalized structure makes it possible for it to be incorporated as a component to a variety or more "theoretical" curricula. Furthermore, the iterative nature of the interface design allows for theories to be introduced and then revisited at each subsequent iteration.

The idea of building a theoretical understanding upon practical knowledge can allow a form of media literacy that reduces the separation between a purely academic critique and the isolated tradition of training for the culture industry. In addition this combination of theory and practice provides an important access point for students because it can use forms of popular culture they are already

familiar with and it allows an outlet for their personal expression. As Stanley Aronwitz points out,

> ...critical work without an effort to produce popular art forms remains a peculiarly intellectual take on cultural life which is already distant from the experience of students. What I am saying is this: There can be no cultural pedagogy without a cultural practice that both explores the possibilities of the form and brings out students' talents. (1989, p.201)

My experience of teaching video production has brought into question a division between the practice of production and the analysis of media as critical area of study. The dependence on technology and the domination of a professional production model entrench a division between the practice of production and a critique of the media product. My difficulty with this inherent division is echoed by what David Sholle and Stan Denski refer to as "feelings of schizophrenia" (1994, p.7). A dichotomy is formed when you teach to create what you are teaching to critique. Sholle and Denski suggest, "building bridges" across this separation by placing production within an "integrated curriculum" (1994, p.171). This form of integration of production with theory is part of the intention behind the design of the Cycles of Iteration interface.

The task of bringing together the production practice with the critical theory is daunting, but the potential rewards are great. The insights gained by a personal, practical awareness of production in combination with a critical theory that contextualizes media socially, politically and economically far outweigh the

inherent challenges. The goal is to move towards an applied pedagogy that blends "learning to do" with "learning to critically understand" (Kline, 2002).

The idea of using the popular product of the culture industry as a pedagogical device has long been a vision of educators (see Crandall, 1926). However, professional modes of media production have demanded resources that were out of reach most education environments. Only recently with the advent of Digital Video (DV) technology has it become feasible to integrate production into other forms of learning. In many cases the computers students are using to type essays and check email are sufficient to edit video as well. The accessibility of video production technology is a major factor in the argument for incorporating production into existing media analysis curricula.

The process of developing the Cycles of Iteration interface was both challenging and informative. It is a pursuit that has no final product only a small contribution to what can be done or improved on in the future. The most important thing I learnt from this development process is that incorporating technologically based teaching resources into the learning environment does not diminish the role of the instructor. Mediating the learning process with technology can be very helpful with many practical aspects of production. Technical specifications, checklists, examples, and the like are well suited to an interface such as the Cycles of Iteration. However, the real synergy between theory and practice comes with a combination of practical skills with critical analysis, discussion, and reflection. This combination can assisted with mediated

pedagogical resources but can only be realized in conjunction with traditional forms of learning that involve a dialog between teacher and learner.

The Cycles of iteration interface was an extremely helpful resource for teaching video production. It has provided a framework for the future addition of much more information and examples. However, the real challenge for future development is how to integrate practical production skills into a curriculum of critical media analysis. The Cycles of Iteration interface represents only the beginning of this challenge.

APPENDIX A: ETHICS APPROVAL (PILOT STUDY)

SIMON FRASER UNIVERSITY

OFFICE OF RESEARCH ETHICS

BURNABY, BRITISH COLUMBIA
CANADA V5A 1S6
Telephone: 604-291-3447
FAX: 604-268-6785

April 16, 2003

Mr. David C. Murphy
Graduate Student
Department of Communication
Simon Fraser University

Dear Mr. Murphy,

Re: Mediated Pedagogical Design: A case study of the cycles of iteration

The above-titled ethics application has been granted approval by the Simon Fraser Research Ethics Board, at its meeting on February 17, 2003 in accordance with Policy R 20.01, "Ethics Review of Research Involving Human Subjects".

Sincerely,

Dr. Hal Weinberg, Director
Office of Research Ethics

/jmy

APPENDIX B: ETHICS APPROVAL (EXPERT PANEL)

SIMON FRASER UNIVERSITY

OFFICE OF RESEARCH ETHICS

BURNABY, BRITISH COLUMBIA
CANADA V5A 1S6
Telephone: 604-291-4370
FAX: 604-291-4860

May 10, 2002

Mr. David Cotter Murphy
Graduate Student
School of Communication
Simon Fraser University

Dear Mr. Murphy:

Re: Pedagogical Media Design Assessment

I am pleased to inform you that the above referenced Request for Ethical Approval of Research has been approved on behalf of the Research Ethics Board. This approval is in effect for twenty-four months from the above date. Any changes in the procedures affecting interaction with human subjects should be reported to the Research Ethics Board. Significant changes will require the submission of a revised Request for Ethical Approval of Research. This approval is in effect only while you are a registered SFU student.

Best wishes for success in this research.

Sincerely,

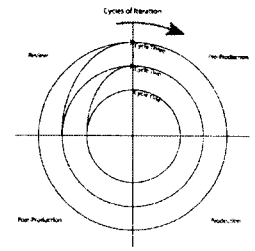
Dr. Hal Weinberg, Director
Office of Research Ethics

c: B. Lewis, Supervisor

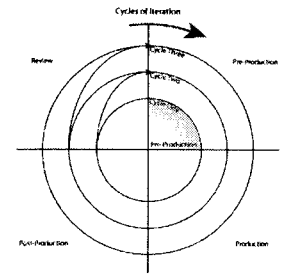
APPENDIX C: STARTING INSTRUCTIONS

Starting instructions for the Cycles of Iteration

The site structure starts with the Cycle home symbol

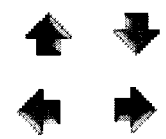


Each cycle begins with the Pre-Production quadrant located at the top right. Clicking on a quadrant takes you into that module:



Each module is divided into two modes:

1. Concepts – textual based, vertically orientated
2. Slides – image based, horizontally orientated

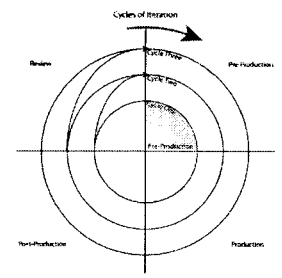


Use the arrow symbols to move up or down through the concepts, or forward or back through the slides

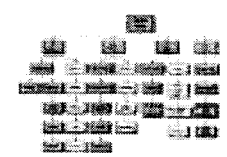
The Cycle symbol will always take you back to the previous level.

Shading indicates your current level

(this example is 1a)



The Index pages show a complete cycle on one page.



APPENDIX D: CD-ROM

See CD-ROM attached on back cover.

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