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A curriculum plan for digital information design

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Winthrop University is offering a new Bachelor of Science degree in Digital Information Design now in its third year. This interdisciplinary program is unique in its organization that spans four departments and three colleges. The four departments include Mass Communication from the College of Arts and Sciences, Design from the College of Visual and Performing Arts, Computer Science and Marketing from the College of Business. It is unique in that students select a track of study that combines a shared core of courses and specialty courses in Digital Mass Media, Interactive Media, Web Application Design, and Digital Commerce. The core courses consist of one or two introductory courses from each specialty through the four-year Bachelor of Science degree. This paper includes a detailed description of the program, a summary of its origins, (largely industry driven) and a description of the assessment criteria, and its development process. A greater emphasis is placed on the Interactive Media track; however, one can assume that the other tracks were subject to equal attention and scrutiny.

Keywords: interdisciplinary, information, design, curriculum

1 McKim, J.C. Jr. et al (2008). Information Design: A Curriculum for the 21st Century, 38th ASEE/IEEE Frontiers in Education Conference, pp. 2-7

1 Introduction

It is only a slight exaggeration to say that all commerce, research, mass communication, and home entertainment are moving to the web. Therefore, there will be a critical need for people who can develop attractive, usable, secure, efficient, and maintainable electronic media for the foreseeable future. It also follows that employers now seek journalists, marketers, and other mass communicators whose skills go beyond the traditional platforms to include a certain amount of web 'savviness'. The journalist may not need to *be* the technical expert, but the journalist needs to be able to *communicate* with that technologist and vice versa. Each needs a fundamental understanding of what the other is trying to do and what the other reasonably can do.

In this paper we present that curriculum with an emphasis on the Design or Interactive Media Specialty. An earlier variation of this paper that emphasized the Web Application specialty was presented to the Frontiers In Education Conference.[1] The current paper also updates the status of the program completing its third year. Our hope is to foster discussion and possible development of similar multidisciplinary programs at other campuses and, critically, to receive feedback on our own.

The next section provides a backdrop to the development of the program and a brief overview of the requirements. We discuss similar programs, followed by an introduction to the core of the curriculum and then move to a discussion of each of the specialties. A section dedicated to assessment planning for evaluating the program as it evolves coincides with Winthrop's own re-accreditation. Finally, we discuss how the program is faring thus far and present our conclusions.

2 **Allen, K.S.** et al (2008). Identifying future skills for technical communicators: An action plan A.L. Boeing, Seattle, WA, Professional Communication Conference, IPCC 2008, IEEE International, p. 3**0**

2 History, motivation, and Overview

At Winthrop University the Visual Communication Design faculty in the Department of Design made current theory, processes and knowledge of technology, aesthetics, as well as some understanding of marketing a priority in their programs. Two usability and electronic media courses were developed in response to comments expressed by employers who were advocating for a more extensive background in web design or multimedia. Over the past decade students reported their work in digital media has risen from 10% in 2001 to well over 50% from traditional Graphic Design students working in their field. Until the digital information design program was developed Graphic Design students only had two courses available to schedule as electives; an Introduction to Web design and Sequential Media.

Similarly, faculty in Computer Science have long been aware that many of their students are hired to be either 'the' technical person or part of a technical team that develops and maintains the company's web presence. From their students' future employers they heard: *These students are really good, but it would be nice if they understood more about usability and esthetics, and they need to be able to talk to the marketers, mass communicators and others who provide the content for the site.*

At the same time Mass Communications faculty in Arts & Sciences, and Marketing faculty in the College of Business Administration were having similar conversations with businesses and organizations in their respective fields.

Following are a sampling of job descriptions we were seeing, that later helped identify future markets for student employment:[2]

- Web content producer: Convergence-based organizer to develop web and newsroom relationship to produce high quality, interactive web-based journalism.
- Creative Director: In this managerial role the creative director will plan, organize and establish a graphic language for interactive devices and larger web projects. They will also direct the web designer and content developer to establish consistent artistic qualities.
- Interactive media/web designer: Creates interfaces for software on interactive devices such as kiosks, phones, PDA's, and computers. They will work partly on the technical aspects of the interface partly on the content for electronic media. The web designer will respond to user interaction and create appropriate visual elements for clients.
- eCommerce Web Developer: In this key role, will participate in the creation, production, and maintenance of high profile e-commerce internet sites.
- Web services product manager: Will be responsible for establishing and evangelizing the company's standard web service product to both client and external constituents.

These interdisciplinary postings covered two, three, even all four of our disciplines with some reference to the area skills found in typical marketing, communications, programming or design jobs. At the same time, students and potential students were asking if Winthrop had programs in these areas or flexible programs that allowed for interdisciplinary degrees. Separately we knew there was a demand for some kind of program, but it was unclear how these different disciplines could connect within the structure of the university and what scope it

3 www.ors2.state.sc. us/ abstract/chapter8/employ ment23.php

4 Morello, D. (2003). Unlocking the Business Value of People: Building Versatility, Gartner ITxpo Conference in Cannes, France, Published Gartner Research, Stamford, p. 18

5 Albers M. and **Mazur, B.** (2003). 'Content and Complexity' Information Design in Technical Communication, Lawrence Erlbaum Associates, Mahwah, NJ, p. 18

6 International Institute for Information Design (2010) [www.iiid.net/Defi nitions.aspx]

7 op cit pp. 6-7

could legitimately cover?

Eventually, these conversations came to the attention of the deans and to the Vice President for Academic Affairs (VPAA). The VPAA recognized the potential for cooperation and in 2005 formed a task force, chaired by the Dean of Business, himself an outspoken supporter of progress in this area. Out of that task force, the authors were brought together to see what kind of curriculum, if any, could be formed from our disparate roots.

To begin, we gathered data to see if there really was a demand for people with the kinds of skills required of future students in this program. One of the authors, Cara Peters, conducted the study. She reviewed trends at the national, regional, and state levels and found that jobs in computing and technology were expected to increase by 20-40%. Most telling was the South Carolina study[3] which showed an increase in "Information" employment opportunities of 21.5% over the ten year period from 2002 – 2012, about double the state average. This industry captures occupations in publishing, motion pictures, broadcasting, telecommunications, and Internet services among other technology related jobs. Dr. Peters also conducted a survey of 46 companies in and around Charlotte, NC, Rock Hill, SC, Columbia, SC, and Greenville, SC. Some of the results of the survey are shown in Table 1.

Table 1 Survey Question Results

If there were college graduates with a focused, but inter-disciplinary, training in graphic design, web design, computer programming, MIS, marketing and mass communications:	
Do you believe that there would be demand for this type of employee?	
Yes 82.6%	No 17.4%
Do you believe that demand for this type of employee will increase in the future?	
Yes 89.1%	No 10.9%
Within the next five years, will your firm be most likely hiring college graduates with a combination of these technological skills?	
Yes 78.2%	No 21.8%
Could a college graduate with a combination of these technological skills fit your requirements better than one who has been educated in only one area?	
Yes 89.1%	No 10.9%

It was important that employers viewed students as 'uniquely qualified' adopting the mentality of the "versatilists" described by Diane Morello and not 'generalist', which we will address later in this paper.[4]

An immediate concern was attempting to define the degree in terms that were broad enough to cover the four areas, without being so general as to convey no meaning. Emphasis on how information is presented, was important enough to be reflected in the title of the program. The public should not consider the program as just the practice of building web navigation, creating graphics, picking fonts, laying out pages, developing content, or using particular web tools. Rather, it is the practice of enabling a reader to obtain knowledge and how we considered it.[5] There was a consensus among the group that teaching should take the perspective of the web user. The context in which the content for the courses developed for the program was equally important. This definition follows the International Institute for Information Design[6] similar to the Information Design Exchange (idX) group definition. "Information design is the defining, planning, and shaping of the contents of a message and the environments it is presented in with the intention of achieving particular objectives in relation to the needs of users".[7]

8 MacLeod, C. (2003). Information Design: An Introduction, p. 3 [www. kelake.org/articles/id/ index.html]

9 Tufte, E. (1990). Envisioning Information, Graphics Press, Cheshire, Connecticut, p. 3

10 Jacobson, R. (1999). Information Design, MIT Press, Cambridge, MA, p. 2

11 Ruhl, G. (2008). Merging territories: Creating an information design baccalaureate degree, IPCC Program, p. 4

A similar definition is also found at the Design Council on Information Design, "Information design is concerned with transforming data into information, making the complex easier to understand and to use. It is a rapidly growing discipline that draws on typography, graphic design, applied linguistics, applied psychology, applied ergonomics, computing, and other fields. It emerged as a response to people's need to understand and use such things as forms, legal documents, computer interfaces and technical information."[8] The focus on electronic media was a common interest of all the disciplines but following discussions in early planning meetings the content and the context in which information is used lead us to information design as a discipline. The term Digital was added to the program name to emphasize the paradigm we were operating under. We settled on Digital Information Design, which solidified the organization and helped direct the degree program and later to form the core.

Digital Information Design has a relationship to the study, organization, and representations of information described by designers such as Edward Tufte[9] and Robert Jacobson[10] "Confusion and clutter are failures of design, not attributes of information. And so, the point is to find design strategies that reveal detail and complexity--rather than to fault the data for an excess of complication. Or, worse, to fault viewers for a lack of understanding. Information designers acknowledge the systematic nature of communication … The best information design acknowledges and uses the interactive nature of communication to convey meaning and heighten understanding among all parties involved in an activity or event". Information Design as a program descriptor for interdisciplinary degrees that include Design, Writing, Technology and Marketing is immerging as a dominant term.[11] It also emphasizes the digital realm of both physical and cognitive interaction.
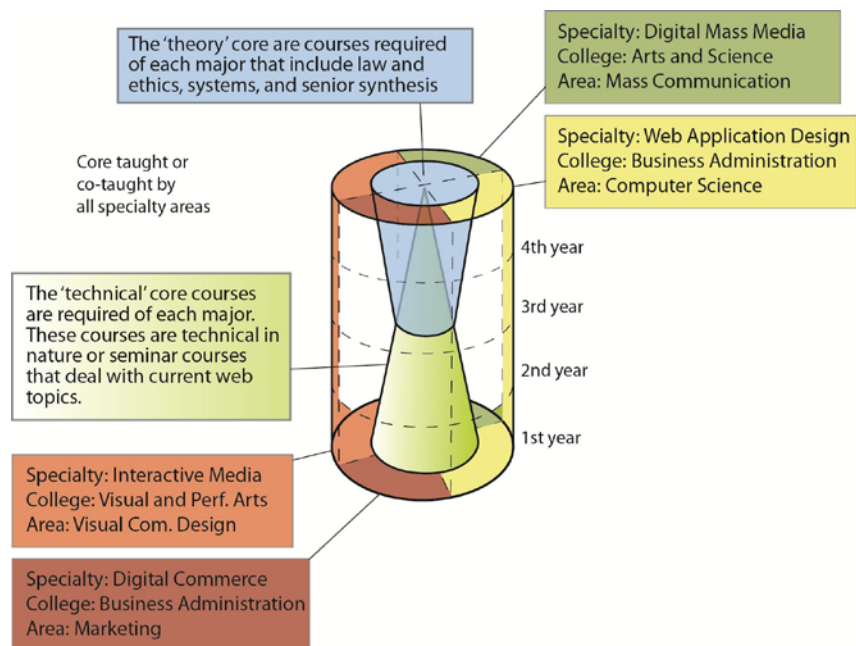

Figure 1 The program structure of Digital Information Design

12 Hoek, A. et al (2005). A B.S. Degree in Informatics: Contextualizing Software Engineering Education, 27th International Conference on Software Engineering, St. Louis, MO, pp. 641- 642
13 More information can be found at: www.ics.uci. edu/informatics

Following these objectives we set out to form a program that would embody clarity, organization of content and placed in the context of web systems. Within six months we had an outline for a major in Digital Information Design that consisted of two main parts.

- A core that contains one or more courses from each of the contributing disciplines or areas: Computer Science, Design, Marketing, and Mass Communications. All students must take the entire core. There is a greater emphasis on technical material in the freshman level and diminishes as students reach their senior year.
- A set of four specialties. Students choose one specialty, Digital Commerce, Digital Mass Media, Interactive Media, or Web Application Design.
- The shared core, with four-track framework was important because it drew partly from onsite expertise and at the same time encouraged departmental growth under a unique degree. The significance of this should not be viewed lightly because it allowed the contributors to identify philosophical similarities that later formed the core. Courses sparking philosophical differences or preferred courses already offered by their home department could be added to the individual tracks without affecting others. (Figure 1)

Courses that did not logically fit into either part of the core moved to a specialty.

3 Similar Programs

Problems arise in locating similar programs because of their particular taxonomy and the emphasis that is placed on areas within other programs. We have found three in the United States, two in Europe and one in China that are similar but all have quite different names from our own and from each other. The University of California, Irvine has a program they call Informatics,[12] The University of Hartford use the term Multimedia Web Design and Development, and Carnegie Mellon has a somewhat similar interdisciplinary program title. The University of Reading offers a Bachelor of Arts in Graphic Communication and The University of Westminster has two degrees that are similar; one in Graphic Information Design and the other in Multimedia and Human Interaction. City University in Hong Kong refers to their program as a Bachelor of Science in Creative Media that combines courses from the School of Creative Media and the Department of Computer Science.

The University of California, Informatics program features a diverse faculty, but otherwise is a traditional major with a collection of required courses and a set number of electives. This is in contrast to our core and specialty approach. In addition, it appears to be a marriage of usability and selected computer science courses. It was interesting to us to note that they do use the phrase "information design" in their descriptions but settled on the more common name of *Informatics.*[13]

The University of Hartford program was formerly known as Interactive Information Technology. The difficulty defining programs of this type under one moniker is reflected in the industry as well. The program at Hartford is a much closer match to our own as it contains a core and a selection of specialties. The core includes courses in technology, mass communication, and marketing, and so lacks the usability and design core course found at Winthrop. However, with the exception of the technology courses, the core courses seem to be drawn from exist-

14 More about this program at: www.mwd.hartford.edu

15 www.design.cmu.edu (under programs)

16 www.hcii.cs.cmu.edu/Academics/HCI_courses.html

17 More information can be found at: courses.westminster.ac.uk

18 City University Creative Media (2010). What is BSc CM? [www.cityu.edu.hk/scm/program/bsccm.htm]

19 CS 3382 Web Usability Design and Engineering

20 www.cityu.edu (under Programmes)

ing mass audience courses whereas ours are almost all designed specifically for Information Design. They have a selection of 6 specialties and an intriguing mechanism whereby students may develop their own unique one. The specialties are limited to 5 courses however, and so do not allow the kind of depth to which we aspire.[14]

Carnegie Mellon University has an interdisciplinary program that offers a combination of Art and Science courses, or students may add a second major in Human Computer Interaction (HCI) from the Computer Science department. The art and science interdisciplinary degree allows flexibility for the student to select courses creating a degree that best suits their interest. This curriculum does not include aspects of business and marketing (although a minor in that area is available) nor does it encourage a cohort of students to follow a similar curriculum. The second major in HCI assumes an additional course load for the student, and can only be accented toward design or human behaviour.[15][16]

The University of Reading program is three years in length and many of the courses cover professional or design practice, the history of design, and typography. Although there may be courses that cover materials in information design it does not appear to extend through every year and the focus seems to be directed at Graphic Design and in particular the area of publishing.

The University of Westminster is also a three-year program but resembles the Interactive Media track at Winthrop closely. The list of subjects of study include: Communication Design, Computer Applications in Design, Contextual Studies, Design Processes, Navigation and Mapping, Photographic Information, Sequential Information, Typolinguistics, Visual Representation of Information. It is also noted on the Graphic Information Design web site that the students will benefit from the relationship with illustration, the School of Media – which offers programs in Multimedia, Computer Science and Journalism, and Art and Design. The addition of the Business Administration classes and their contribution to our programs core is the distinguishing difference between the two. It is however, difficult to determine the number of classes in these areas any given student will take at Westminster. At Winthrop Information Design is central to the program ensuring all of our students have the same foundation making their specialty the unique quality to their degree. Westminster also offers a Bachelor of Science in Multimedia and Human Interaction but it to does not include course in Business or Mass Communication.[17]

It is clear that the two disciplines that make up the Bachelor of Science in Creative Media at City University in Hong Kong have foundations in Computer Science and what some schools refer to as Multimedia. Courses listed in these two disciplines make up many of the Interactive Media curriculum at Winthrop. The emphasis does seem to be on the "artistic side" of multimedia design to, "produce graduates that bridge the gap between the technical and the artistic side of the media field".[18] Students interested in creative activities using technology are pointed toward courses in Game Design, Video, Sound, and Special Effects. The program however, has only one course in usability[19] and it is an elective.[20]

4 The Core

The core courses, distinguished by the DIFD designator, needed to consist of at least one course from each discipline. Philosophically, each course is the story of

21 Society for Technical Communication - STC (2005). [www.stcsig.org/id/id_definitions.htm]
22 VCOM 262 Introduction to Web Design
23 VCOM 262 and CSCI 101

Digital Information Design told from that discipline's perspective.

The philosophy echoed in the description of the practice by the Information Design Special Interest Group (SIG) of the Society for Technical Communication (STC) is stated this way, "The practice of information design requires an interdisciplinary approach combining skills in areas including graphic design, writing and editing, instructional design, human performance technology, and human factors".[21] If one considers the core as those courses necessary for Information Designers to practice we can see the correlation to three of the disciplines – graphic design (visual communication design), writing and editing (mass communication) and human performance technology (computer science). Those courses that are not immediately defined within these domains such as instructional design and human factors are partially covered by business management or covered in classes that do not have any strong affiliation to a particular specialty.

In order for students to work immediately with digital media it was determined that technically oriented core courses would be placed early in the program, and keep the more theoretical and application oriented courses for later years. (Figure 1) The process for including courses came out of comparing lists of classes and their descriptions to see where overlap of subjects occurred, if three or all four overlapped it was adopted into the core. Courses were added to or modified to help cover some information pertinent to all the specialties and to ensure they benefit all four areas. For example, everyone agreed communications theory was an important core subject taught by the Mass Communications faculty. However, the relevance DIFD 211 Communication Theory and the Internet has to Interactive Media Design students includes some typographic information such as readability, legibility and hierarchy. What was withdrawn from consideration were courses that appeared to be special topics such as a color theory class that serviced Interactive Media students specifically but could be discussed in introductory design courses[22] within the core to give all Information Design students a basic understanding. Courses that overlapped in two of the specialties were not included in the core but often adopted by the specialties as a requirement for their own track. We came to quick agreement on a first year seminar, a third year seminar, a course on ethics, and a senior synthesis. These courses accomplish two things; first they introduce the foundations of Information Design principles, and secondly they were to reflect the fluid nature of the industry and allow professors to integrate topical news and case studies as they arose. Professors from each discipline co-teach these classes or invite guest speakers such as Stan Ruecker from the University of Alberta's Humanities Computing program or Isabel Meirelles from Northeastern University who specializes in Visualization Design. In an effort to combine student expertise while challenging them to work in teams from the different areas a senior synthesis class was created to enable group projects.

Two courses overlapped in all four disciplines and were determined to be of value to their specialty. Because these two courses already existed before the DIFD program was developed their designators were unchanged so that other programs outside of the Digital Information Design degree could continue include them as part of their curriculum without confusion.[23]

All core courses designed with the respect for content and context of digital media and how that affects user interaction and experience, was followed by includ-

ing theoretical criteria into the third year core. Organizational and systems theory and methodology intensive classes such as DIFD 321 Information Systems and Organizations, and VCOM 322 Visual Design of Complex Systems accomplish this by teaching students the structure of web systems and the relationships of data as well as their relationship to user expectations or needs. They also cover methodologies and best practices for categorizing data, visually organizing information and usability testing of these systems.

Included below is a brief descriptions and prerequisites. All courses designated DIFD were developed, or are in the process of being developed for this program. As stated earlier courses with other designators had been previously developed and adopted into the core.[24]

Freshman year

CSCI 101. Introduction to Computing and Information Processing: This is an existing 1.5 credit computer literacy course that also contains a substantial introduction to HTML. Typically students take three 0.5 credit labs along with this course to round out 3 credits. Digital Information Design students are all required to take labs in basic skills, Photoshop, and Programming. No prerequisite. Alternatively students may take a more programming oriented course as their first core course. Most science majors take CSCI 151, Introduction to Computer Science, and we have found that course to be a good introduction to the rest of the core.

  DIFD 141, Introduction to Web Application Design: This is a four-credit introduction to client side technologies including XHTML, CSS, and JavaScript. Either of the courses mentioned above may serve as the prerequisite.

  DIFD 151, Digital Information Design Seminar: Introduction to Digital Information Design. This one credit course gives our students a chance to get to know each other while we introduce the various specialties to them. By the end of the course we hope they can make an informed decision as to their specialties. Open only to DIFD majors, no other prerequisite.

Sophomore year

  VCOM 262, Introduction to Web Design: This three-credit course is an introduction to usability methods and requires DIFD 141 as either a pre- or co-requisite.

  DIFD 211, Communication Theory and the Internet: This three-credit course introduces concepts such as audience analysis and how writing for the internet is different than writing for other media. The prerequisites are CSCI 101 or CSCI 151 and a general education writing course.

Junior year

  DIFD 321, Information Systems and Organizations: This three-credit course introduces digital commerce and requires DIFD 211.

  DIFD 351, Digital Information Design Seminar: Special Topics. This one credit seminar is a showcase for state-of-the-art work in Digital Information Design either in academe or in the workplace. The prerequisite is DIFD 151.

  DIFD 322, Visual Design of Complex Systems: This four-credit course goes much deeper into usability than the earlier introduction including navigation

25 Yeomans, S. R. & **Atrens, A.** (2001). A Methodology for Discipline-Specific Curriculum Development, Int. J. Engng Ed., UK, 17:6, pp. 518-528

26 Bonsiepe, G. (1994). A Step Towards the Reinvention of Graphic Design, *Design Issues*, Published by: The MIT Press, 10:1, pp. 50

principles, visualization of information and usability testing. The prerequisite is DIFD 211 and DIFD 141. DIFD 321 may be taken as a co-requisite.

Senior year

DIFD 415, Law and Ethics for Digital Media: This three-credit course requires students to integrate legal and ethical concerns relative to Digital Information Design. The prerequisite is DIFD 322.

DIFD 451, Senior Synthesis: This is a three-credit course in which students work as a team to solve a real world problem. The ideal team would include a student from each specialty. Prerequisites are DIFD 415 and DIFD 322.

5 The Specialties

When it was time to build the specialties, there was a strong sense that each one should be somewhere between a major and a minor in the "mother" field. A full major on top of the extensive core would require an impractical number of credit hours and might tend to dilute the multidisciplinary nature of the program. We wanted substantial depth in each field, however, as we really want our students to earn the title "Specialist". So specialists in Web Application Design will get a healthy dose of Computer Science, those in Interactive Media a goodly helping of Graphic Design, Digital Mass Media a substantial amount of Mass Communication, and Digital Commerce some solid Business and Marketing courses. The respective areas formed lists of characteristics categorized as knowledge, skills, and attitudes they envisioned in DIFD graduates. We used directives specified in the universities "vision of distinction" such as live, lead, and learn to guide our choices and examined desirable qualities of graduates of the related – more traditional - fields. To answer the question, "what knowledge should an Information Design graduate have?" we considered each track. A balance between knowledge of Information Design and knowledge of their chosen field along with the general education requirements averages 125.5 hours similar to their more traditional programs. We also wanted to maintain the interdisciplinary nature of each specialty, so we each actively looked for courses in the other disciplines that would make sense in our specialty. As well the students needed to possess a strong technical knowledge. Determining skills such as the ability to apply knowledge, communicate effectively, and have aptitude for creative and critical thinking were checked against the line up of classes needed in each specialty or determined to be covered in the core. Desired attitudes of professionalism and ethics were also dealt with in the core courses as well as the general education program required of all Winthrop students. These categories followed institutional policy and national conventions but are best articulated by Yeomans and Atrens in their article Methodology for Discipline-Specific Curriculum Development. "What attitudes should [students] have? 1) Ethics 2) Professionalism 3) Desire for life-long learning 4) Openness to new ideas."[25]

5.1 Interactive Media

This specialty required the most new courses since there were a limited number of Graphic Design courses available before now. Four core competencies were identified for the students who followed this track including technology, aesthetics, content development, and usability or user experience.[26] These competencies

27 Carliner, S. (2001). Emerging Skills in Technical Communication: The Information Designer's Place in a New Career Path for Technical Communicators. Technical Communication. 48:2, pp. 156-175

have been integrated into the courses that build on interactive design theory and fundamentals of visual communication design. To start, the track was designed as a two-pronged pathway to teach Interactive Media and Multimedia Design skills discretely. In advanced classes the relationship between interaction and content is studied as they work together. Students focus on the experience they are creating, attempting to anticipate the interests of the user at any given moment. A foray into system design and the notion that humans encounter sequences of information and interact inside a system are considered in each student project. As noted below, two of these are also required for Web Application Design. Just as Web Application Design Specialists need to know more about usability than the average Digital Information Designer, so too do Interactive Media specialists need to go beyond the fundamentals in technology. Thus, in addition to the new and existing Graphic Design foundation, the Interactive Media specialist must take technology up through the Data Structures equivalent mentioned in the Web Application specialty.

This specialty has other natural overlap with Digital Mass Media. Therefore, a "take two of the following courses" approach from Mass Communications is required. Students may also slant their degree toward more traditional graphic design skills with additional typography, graphics and package design courses, or toward exotic options such as digital music.

5.2 Web Application Design

Specialists in this area should be nearly as technically competent as a computer science major. In fact, the original hope was that we could adapt our existing professionally accredited CS1, CS2, and Data Structures sequence to accommodate Digital Information Design majors. This was not feasible as the accreditation standard is so proscriptive about these courses; consequently, there simply was no room for adaptation. We therefore developed separate courses that will bring students to the same level of technical competence through a different path. Once this is complete students in Web Applications Design are required to, take a number of existing computer science courses including Database Systems, and a two semester sequence in Software Engineering.

In addition, specialists in this area must be knowledgeable in usability issues beyond the core courses and must be able to work with alternative media such as handheld devices.[27] Hence a number of courses developed by the Design department for the Interactive Media specialty are required. VCOM 363 Sequential Media I and VCOM 462 Alternative Platforms are courses that implement demographic data and user testing into every project. Students begin to see how their work tangibly effects interaction, where quality of design is not assured without considering human factors.

5.3 Digital Mass Media

By its nature, the existing Mass Communication curriculum already included a heavy dose of the internet and already overlapped the Design department and the Marketing Department. We added one new course, *Writing for Interactive Media*, specifically designed for this specialty. Beyond that, this option consists mainly of carefully chosen existing Mass Communication courses with some new and existing Interactive Media courses included as well.

28 Harrington, H.J. & **Harrington, J.S.** (1996). High performance benchmarking: 20 steps to success, McGraw-Hill, New York, pp. 40-42

5.4 Digital Commerce

For this specialty we were able to reuse a large number of existing business courses with the proviso that some of them ramp up their internet component. The most natural overlap is with Digital Mass Media and indeed two Digital Mass Media courses are required including the new *Writing for Interactive Media*.

6 Assessment

It can be said that Digital Information Design is by far the most complex curriculum of any the authors have had a hand in developing. We therefore worked diligently to keep the assessment criteria as simple as they could reasonably be and by employing a simple construct for the assessment, developed in the late 1970s by Harrington and Harrington.[28] This stage of the assessment should be construed as a "benchmarking" plan, the first stage in a process for quality improvement. External and internal assessment will follow as the program rolls out into the full four years and beyond.

It was determined that nine total goals would serve to assess the program; one overall integrated goal (1), one high level goal in each specialty (4), and one basic goal in each specialty (4).

We felt we needed one integrated goal, a goal that captured the essence of the core-with-specialty approach and that also captured the spirit of teamwork we hope to imbue in the students. After all, this program is all about learning your own specialty, while also learning enough about the other specialties to effectively communicate. (Table 2)

The idea behind the high-level specialty goals is to assess whether students have captured the essence of their specialty. Fears of educating generalists in the different areas were addressed with the high level goal to ensure the quality of student who has specialized knowledge in each field of Digital Information Design. It emphasizes the balance we are attempting to strike between the individual specialty and the importance of the team. For example, here is the high level goal for the Interactive Media specialty: (Table 3)

For the basic goals in the specialties we tried to capture what every Digital Information Design student should know about that specialty. In each case the basic goal is a subset of the high level goal. After all, the specialist in the area must surely know the basics in the area. Naturally, we can only measure these goals in courses that *all* specialty students take. For the Interactive Media specialty we have: (Table 4)

Nine goals may seem onerous, but anything less leaves rather large holes in the assessment process. In addition, a student looking at these goals would realize that only 5 really apply to him or her: As a student I should endeavor to satisfy the integrated goal, the highest level goal in my specialty, and the basic goals in the other three specialties.

Within each area, assessment of student skills gained from the specialty courses are measured for preparedness as you would for prerequisite courses. This connects core courses to the specialties and back again. Building on achieved skills seems obvious but, must be monitored because specialty courses often service more than just DIFD students. For example, students in Multimedia Design courses are as likely to be traditional Graphic Design majors as they are to be

DIFD majors. This also makes it difficult to determine a simple prerequisite for a course. Assessment methods include design projects, oral review and written examinations. Data from each specialty has been collected since the launch of the program in 2007. Digital Information Design uses assessment tools recommended by the Southern Association of Colleges and Schools (SACS).

Table 2 Integrated goal

Each student is an effective member of diverse teams that successfully complete a number of Digital Information Design projects. In the Senior Synthesis, each student takes a leading role with respect to their own specialty.	Measured in DIFD 141 (Web Application Design), DIFD 415 (Senior Synthesis) and in DIFD 351 Senior Seminar

Table 3 High level interactive media goal

Students will be able to analyze complex system design through visual interpretations of navigation tools, visual charts, and other online visual interactive systems.	Measured in VCOM 262 (Introduction to Web Design) DIFD 321 Information Systems and DIFD 322 Visual Design of Complex Systems (the usability course).

Table 4 Basic interactive media goal

Students will understand the function, order and aesthetics of web design as it relates to user needs.	Measured in VCOM 262 (Introduction to Web Design) and in subsequent web design courses VCOM 362 and VCOM 462.

7 Current Status

Winthrop began advertising this program in the spring of 2007 and we currently have about 20 majors in their third year and just short of 30 freshmen and transfers just starting. All the new freshman-level courses required either for the core or for the specialties are up and running with healthy enrollments. Two of the three faculty positions filled out Interactive Media and the Digital Mass Media tracks later in 2007 and 2008. A professor from Computer Science started the program leaving Business Administration to fill the remaining spot.

We continue to refine the course sequences and the content for each course while retaining the shared nature of the core curriculum plan. The complexity of the design demands regular meetings and increased communications, as the curriculum meets real students, some adjustments have been necessary. Some of these are outright errors (e.g. copying errors that resulted in mistaken prerequisites being listed), but most are more subtle. Students are not ready for a seminar on current issues within Digital Information Design until they have had more than four of the ten core courses, therefore we do not offer Digital Information Design Seminar (DIFD 351) until junior year, instead of sophomore year as originally planned. Also planning courses around the "traditional student" (students in the original tracks outside of Digital Information Design) who may be interested in our program or DIFD students who have conflicting courses in the specialty need to be considered closely.

We have addressed some of these issues by forming a DIFD Task Force that effectively acts the way a traditional department would. This group is responsible for curriculum changes, scheduling, faculty assignments, and so on, particularly with respect to the core courses. The four relevant department chairs and one

"normal" faculty member from each department (including three of the authors of this paper) comprise the task force.

8 Conclusions

In this paper we have presented a new major, Digital Information Design that the authors developed and is in its third year at Winthrop University. In the program we require one or more core courses each semester recommending students choose one area as their specialty. Students are also required to take two 1-credit seminars along the way and finish with a three credit Senior Synthesis in which they will form multidisciplinary teams to design for world problems.

The position of this program is unique in its offering but also unique to this area of the United States and has the potential to grow student enrolment in all the departments involved. Early indications suggest that students do not fully understand the design implications on a large audience. Analytical tools that measure audience participation have not been fully explored nor integrated into design analysis. Students in the Digital Commerce track may take advantage of these tools and assume the guardianship of this data, but have not at the time of writing this paper. We are very conscientious of adding more to the program without considering what is essential to the educating students in this discipline. Further study may find that graduate level study is required to fully participate in the increasing amount of information that is part of this domain.

At the heart of this program the core covers information design subject matter that is similar to many programs. The two unique features are the relationship of the specialties to the core, and the emphasis on digital media. The flexibility of the specialties gives students an opportunity to study in particular areas of the field and still giving them a deep understanding of usability, design, technology, writing and marketing. It also allows the disciplines to manipulate curriculum as new processes, technologies, and even wholesale shifts in industry direction occur. The interdisciplinary nature of the program reflects the nature of industry as it moves toward tackling the proliferation of digital information design problems. It does not fully constitute a systems design curriculum but does provide a better environment for discipline interaction and an opportunity for students to study the effects of Interactive Media on audiences that engage them.

Most recently a preliminary paper presented at the AIGA Design Educators Conference regarding the senior synthesis course entitled, "Processes Interacting between Designer, Developer, and Marketer" discusses the relationship of three of the disciplines. Continued research into our student outcomes, their integration into the industry, and how they will begin to change the processes in place to enhance interaction between their colleagues and users will be closely measured. Both students and employers have begun to discover the program surprised by the progressive approach we have taken in its design. We are pleased to have added to the 65 students enrolled in the first three years of the program and look forward to rolling out the remainder of the curriculum for them over the next year.

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